ISSN 1309-0399 • EISSN 1309-0380

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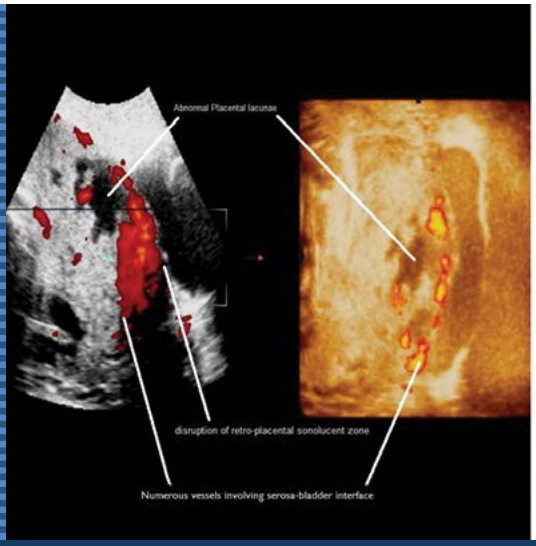
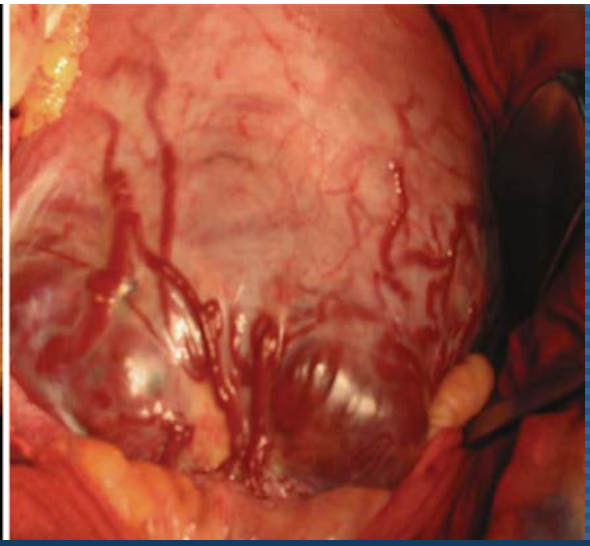
TURKISH-GERMAN GYNECOLOGICAL EDUCATION and RESEARCH FOUNDATION

Journal of the Turkish-German Gynecological Association





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September
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E-mail: tajev@tajev.org

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Journal of the
Turkish-German
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Journal of the Turkish-German Gynecological Association is the official, open access publication of the Turkish-German Gynecological Education and Research Foundation and Turkish-German Gynecological Association and is published quarterly on March, June, September and December.

The target audience of Journal of the Turkish-German Gynecological Association includes gynaecologists and primary care physicians interested in gynecology practice. It publishes original work on all aspects of gynecology. The aim of Journal of the Turkish-German Gynecological Association is to publish high quality original research articles. In addition to research articles, reviews, editorials, letters to the editor and case presentations are also published.

It is an independent peer-reviewed international journal printed in English language. Manuscripts are reviewed in accordance with "double-blind peer review" process for both referees and authors.

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STARD checklist for the reporting of studies of diagnostic accuracy (Bossuyt PM, Reitsma JB, Bruns DE, Gatsonis CA, Glasziou PP, Irwig LM, et al, for the STARD Group. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. Ann Intern Med 2003;138:40-4.) (http://www.stard-statement.org/),

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MOOSE guidelines for meta-analysis and systemic reviews of observational studies (Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting Meta-analysis of observational Studies in Epidemiology (MOOSE) group. JAMA 2000; 283: 2008-12).

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State concisely the purpose and rationale for the study and cite only the most pertinent references as background.

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Describe the plan, the patients, experimental animals, material and controls, the methods and procedures utilized, and the statistical method(s) employed. In addition to the normal peer review procedure, all randomized controlled trials (RCTs) submitted to the journal are sent to members of a team of professional medical statisticians for reviewing.

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Present the detailed findings supported with statistical methods. Figures and tables should supplement, not duplicate the text; presentation of data in either one or the other will suffice. Emphasize only your important observations; do not compare your observations with those of others. Such comparisons and comments are reserved for the discussion section.

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The main text of case reports should be structured with the following subheadings: Introduction, Case Presentation, Discussion.

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Editorial

Dear Colleagues,

I am delighted to introduce the third issue of the "Journal of the Turkish German Gynecological Association (J Turk Ger Gynecol Assoc)" in the publishing year of 2015. Our objective is to collect more and more research studies from Turkey and the international gynecology and obstetrics community.

Since our journal was indexed in the Pubmed Central, the quality and quantity of the papers were increased. We are proud to say that J Turk Ger Gynecol Assoc is now more popular than it's used to be. The papers in this particular issue reflect this awareness and popularity. Here you may read many good quality manuscripts from all around the world like Kuwait, Egypt, Italy, Germany, United Kingdom and India as well as Turkey.

The incidence of morbid adherent placenta has increased significantly over the last 50 years. You will read a paper about the detection for the accuracy of the three-dimensional multislice view Doppler in the diagnosis of morbid adherent placenta. Another important factor in women life is the late detection of ovarian cancer. A study evaluated the efficacy of 18F-fluorodeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT) in recurrent disease, response to therapy, and long-term follow-up of ovarian cancer (OC) patients in relation to cancer antigen-125 (CA125) levels and the prognostic meaning of this modality in this subset of subjects. Myoma insemination after laparoscopic myomectomy is still a hot topic and we have a good review on it. You will also get the occasion to read an interesting paper - about G spot. The G-spot had been described more than 60 years ago by the German gynecologist Gräfenberg. Again a study from Germany will show G spot augmentation to us. You will find more and more interesting articles with in this issue. Hope you will enjoy it.

Dear young colleagues and residents,

One of the outcomes of the scientific research is the publication. A scientific experimentation cannot be considered complete unless published, even if the research itself is very brilliant. Without publication, science is unable to exceed itself. Scientific researcher shall not only make science but also put its thoughts on paper. Unfortunately not all scientists are good authors. Concerning this matter, my suggestion for you is to have a glance at the spelling rules of our journal and the printed or published sources on your topic before writing a good article. Please also do not hesitate to ask for assistance from more experienced instructors or teachers. Besides, the editors of our journal Prof. Yaprak Üstün, Prof. Eray Çalışkan and Assoc. Prof. Gazi Yıldırım will be pleased to assist you about these issues. I look forward to seeing your qualified research studies and articles in our journal.

I would also like to inform you about the fifth Social Responsibility Project of our foundation, Turkish German Gynecological Education and Research Foundation (TAJEV), which will be held on September 11-12, 2015, in Çanakkale - Turkey. The project is traditionally organized from four steps; public awareness meeting with participation of the locals, the scientific meeting with participation of health professionals, performing of the advanced operations and medical examination/screening to local women, and finally a medical device donation to a local hospital. We believe our project could be considered a success if we will only be able to help only one woman to become more conscious about herself and her baby. Since it is these small steps which may one day make the difference. We would be excited to have our colleagues join us in these intense scientific activities.

Finally the holiday season is up to end. I wish you a great scientific and energetic new academic season.

Best regards,
Prof. Cihat Ünlü, M.D.
Editor in Chief of J Turk Ger Gynecol Assoc
President of TAJEV

Accuracy of three-dimensional multislice view Doppler in diagnosis of morbid adherent placenta

Alaa M. Abdel Moniem[1], Ahmed Ibrahim[2], Sherif A. Akl[2], Loay Aboul-Enen[1], Ibrahim A. Abdelazim[3]

[1]Department of Ultrasound and Fetal Care Unit, Ain Shams University, Cairo, Egypt

[2]Department of Obstetrics and Gynecology, Ain Shams University, Cairo, Egypt

[3]Department of Obstetrics and Gynecology, Ain Shams University, Cairo, Egypt and Ahmadi Kuwait Oil (KOC) Company Hospital, Ahmadi, Kuwait

Abstract

Objective: To detect the accuracy of the three-dimensional multislice view (3D MSV) Doppler in the diagnosis of morbid adherent placenta (MAP).

Material and Methods: Fifty pregnant women at ≥28 weeks gestation with suspected MAP were included in this prospective study. Two dimensional (2D) trans-abdominal gray-scale ultrasound scan was performed for the subjects to confirm the gestational age, placental location, and findings suggestive of MAP, followed by the 3D power Doppler and then the 3D MSV Doppler to confirm the diagnosis of MAP. Intraoperative findings and histopathology results of removed uteri in cases managed by emergency hysterectomy were compared with preoperative sonographic findings to detect the accuracy of the 3D MSV Doppler in the diagnosis of MAP.

Results: The 3D MSV Doppler increased the accuracy and predictive values of the diagnostic criteria of MAP compared with the 3D power Doppler. The sensitivity and negative predictive value (NPV) (79.6% and 82.2%, respectively) of crowded vessels over the peripheral sub-placental zone to detect difficult placental separation and considerable intraoperative blood loss in cases of MAP using the 3D power Doppler was increased to 82.6% and 84%, respectively, using the 3D MSV Doppler. In addition, the sensitivity, specificity, and positive predictive value (PPV) (90.9%, 68.8%, and 47%, respectively) of the disruption of the uterine serosa-bladder interface for the detection of emergency hysterectomy in cases of MAP using the 3D power Doppler was increased to 100%, 71.8%, and 50%, respectively, using the 3D MSV Doppler.

Conclusion: The 3D MSV Doppler is a useful adjunctive tool to the 3D power Doppler or color Doppler to refine the diagnosis of MAP.

(J Turk Ger Gynecol Assoc 2015; 16: 126-36)

Keywords: Multislice view, Doppler, morbid adherent placenta

Received: 09 March, 2015 **Accepted:** 09 June, 2015 **Available Online Date:** 14 July, 2015

Introduction

Placenta accreta occurs when placental trophoblasts invade the endometrium beyond the Nitabuch's layer of decidua basalis, placenta increta occurs when placental trophoblasts invade the myometrium, and placenta percreta occurs when placental trophoblasts invade the serosa (1, 2).

Morbid adherent placenta (MAP) is generally associated with excess blood loss, bladder injuries and hysterectomies (3, 4). The incidence of MAP has increased significantly over the last 50 years (5, 6).

A past history of a cesarean delivery, placenta previa, and damage of the Nitabuch's layer of decidua basalis following intrauterine infection or scarring are the risk factors of MAP. The incidence of MAP is increased concomitantly with increased cesarean section rates (1, 7-9).

The incidence of MAP is 3.3% in pregnant women with no past history of cesarean delivery and placenta previa and is 40% in pregnant women with a history of two cesarean sections and placenta previa (4). If MAP was diagnosed or suspected before delivery, the optimum time for planned delivery is around 34–35 weeks, following a course of corticosteroids and multidisciplinary team care approach (2, 10, 11). An accurate diagnosis of MAP is essential to prepare both the patient and health providers for possible complications during delivery. Authors reported that ultrasound is a useful tool to diagnose MAP, with 77%–93% sensitivity and 71%–98% specificity (12-16).

Moodley et al. (17) concluded that the color flow Doppler was more specific, with a 95% negative predictive value (NPV) in the prenatal diagnosis of MAP, than magnetic resonance imaging (MRI), and MRI should be reserved for cases with inconclusive sonographic findings (13, 15, 17). The sonographic markers of placenta accreta can be seen in the first trimester of pregnancy in the form of low implantation of the pregnancy sac and multiple vascular spaces within the placenta (2).

Prenatal diagnosis of MAP with gray-scale and Doppler sonography allows the development of the multidisciplinary team care approach during delivery (14). This current study aimed

Address for Correspondence: *Ibrahim A. Abdelazim, Department of Obstetrics and Gynecology, Ain Shams University, Cairo, Egypt and Ahmadi Kuwait Oil (KOC) Company Hospital, Ahmadi, Kuwait. Phone: (+965)-66551300 e.mail: dr.ibrahimanwar@gmail.com*

DOI:10.5152/jtgga.2015.15038

to evaluate the accuracy of the three-dimensional multislice view (3D MSV) Doppler in the diagnosis of MAP.

Material and Methods

From February 2010 to February 2012, pregnant women at ≥28 weeks gestation with placenta previa anterior covering the scar of the previous cesarean section scar by trans-abdominal gray-scale ultrasound scan were included in the current study after the approval of the ethical committee. A thorough analysis of the history and examination of all the subjects was followed by two-dimensional (2D) trans-abdominal gray-scale ultrasound scan to confirm the gestational age, placental location, and findings suggestive of MAP. The findings suggestive of MAP by 2D gray-scale ultrasound scan were as follows:

1. Obliteration of a clear space between the uterus and placenta (Figure 1, 2),
2. Visualization of the placental lacunae (irregular vascular spaces), moth-eaten appearance of the placenta (Figure 1, 2),
3. Interruption of the posterior uterine serosa-bladder interface, and
4. Exophytic mass invading the bladder (11, 18).

The 2D gray-scale ultrasound scan was first performed followed by the 3D power Doppler and then the 3D MSV Doppler by a sonographer who was blinded to the patient`s criteria to confirm the diagnosis of MAP. All scans were performed for all subjects in the supine position, with sufficient bladder volume to allow the optimal visualization of the uterine serosa-bladder interface using the Medison machine (Sonoace X8, Medison Co., South Korea) with a 4–7 MHz (Megahertz) multi-frequency convex probe. The 3D power Doppler was targeted to analyze and define the vasculature of the lower uterine segment and placenta. Using a motorized curved array transducer with 100% power, 0.9 KHz of pulse repetition frequency, −5.4 gain, and low wall motion filter, 3–5 3D volumes were obtained. The 3D power Doppler images were analyzed using a computerized program. Two views of the 3D power Doppler were generally analyzed; lateral view to observe the intra-placental vasculature and basal view to observe the serosa-bladder interface. At least one of following findings was suggestive of MAP by the 3D power Doppler:

1. Disruption of the retro-placental sonolucent zone and/or abnormal placental lacunae in lateral view,
2. Numerous vessels invading the uterine serosa-bladder interface and/or crowded vessels over the peripheral subplacental zone in basal view (Figure 3).

During the 3D MSV Doppler technique, the 3D volume transducer was mechanically and systematically moved over the defined region of interest (ROI) to obtain volume data in three planes (sagittal, coronal, and axial); sampling was performed between 95 and 255 consecutive slices per volume. The volume data were stored on the machine's hard drive. MSV allows a simultaneous display of multiple parallel cuts per volume, up to 24 preselected parallel cuts (slices) from a volume (19, 20). Slices can be generated either from the initial or any other reconstructed ROI. In addition, vasculature within a defined ROI was obtained in power mode (19, 20). The most informative image from parallel cuts (slices) was displayed using Medison

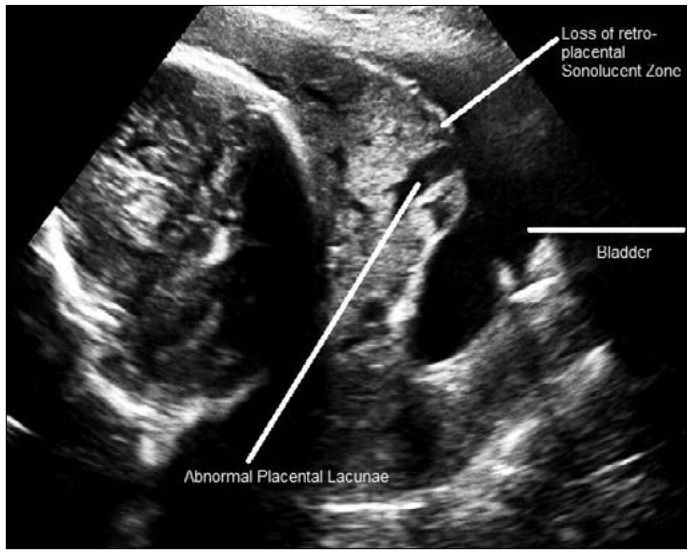

Figure 1. 2D gray scale ultrasound scan shows the loss of the retro-placental sonolucent zone and abnormal placental lacunae in MAP

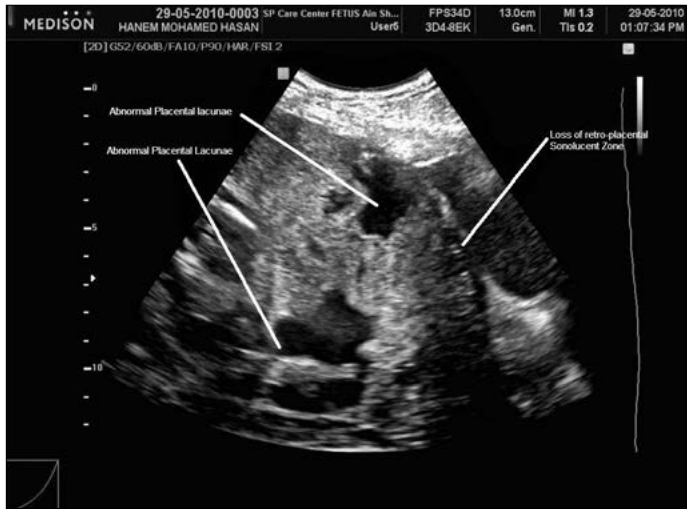

Figure 2. 2D gray scale ultrasound scan shows the loss of the retro-placental sonolucent zone and abnormal placental lacunae in MAP

Dynamic-like Magnetic Resonance (DMR), a post-processing tool to reduce speckle artifacts, leading to sharp images. Image processing was performed using Medison XI Viewer, version v1.1.0.723 software. Findings of the 3D MSV Doppler suggestive of MAP were as follows:

1. Abnormal placental lacunae (Figure 4a, b) arrow A, 2. Disruption of the uterine serosa-bladder interface (Figure 4b, c) arrow B, 3. Numerous vessels invading the uterine serosa-bladder interface (Figure 4 d-f) arrow C, and 4. Crowded vessels over the peripheral sub-placental zone (19, 20).

According to the hospital protocol, subjects were hospitalized at 32 weeks and delivered at 35 weeks, following a course of corticosteroids. An emergency cesarean section was performed if significant bleeding developed before the time of the planned cesarean section. All deliveries were conducted in the

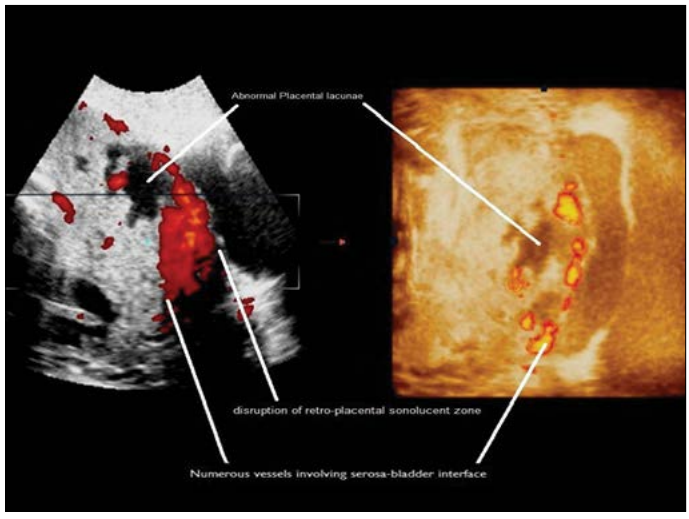

Figure 3. 3D power Doppler shows numerous vessels invading the serosa-bladder interface, disruption of the retro-placental sonolucent zone, and abnormal placental lacunae

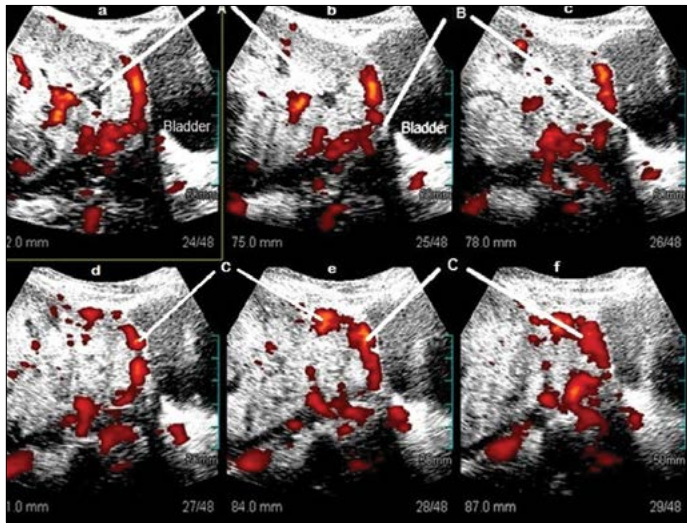

Figure 4. 3D MSV Doppler; (a) and (b) shows abnormal placental lacunae (arrow A); (b) and (c) shows disruption of the uterine -bladder interface (arrow B); (d), (e), and (f) shows numerous vessels invading the uterine serosa-bladder interface (arrow C)

presence of obstetrics and anesthetic consultants on duty, and the urologist on duty was informed in case bladder injury or reconstruction was needed (2-10). A written consent explaining the possible intraoperative complications (blood transfusion, hysterectomy, internal iliac ligation) and postoperative complications (deep venous thrombosis, prolonged hospital stay, and intensive care unit admission) was obtained from all subjects. Women included in this study were also cross-matched with fresh frozen plasma and packed red blood cells (RBCs). Intraoperative findings, including a difficulty in placental separation, degree of placental invasion, bleeding from the placental site, amount of blood loss, intraoperative blood transfusion, need for internal iliac ligation or emergency hysterectomy to control the bleeding, and histopathology results of the removed uteri in cases managed by emergency hysterectomy specialists were recorded (21). The calculated estimated blood loss (cEBL) was evaluated using the formula proposed by Stafford et al. (22). Intraoperative findings (Figure 5) were compared with preoperative sonography findings to detect the accuracy of the 3D MSV Doppler to diagnose MAP.

Sample size justification

Using data from previous studies which found; a strong association between bladder invasion in MAP and 3D power Doppler findings (23), color Doppler had 82.4% sensitivity, 96.8% specificity, 87.5% and 95.3% positive and negative predictive values; respectively to diagnose MAP (12) and EpiInfo® version 6.0 a sample size of 49 women was needed to produce a significant difference after assuming a 5% drop-out rate.

Statistical analysis

Data were collected and statistically analyzed using the Statistical Package for Social Sciences (SPSS) computer software version 18 (SPSS Inc., Chicago, Illinois, USA). Mean and standard deviation (SD) were used to represent numerical variables, while number and percentage were used to represent categorical variables. Student's t and Mann–Whitney's U tests

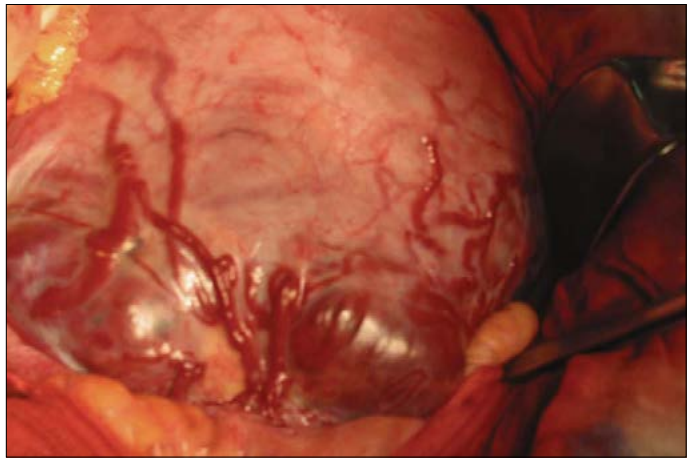

Figure 5. Intraoperative findings of a case of MAP with numerous engorged vessels over the uterine serosa and confirmed as placenta percreta after hysterectomy

were used for the analysis of quantitative data, chi-square test for the analysis of qualitative data, Spearman's correlation test to detect the relationship between quantitative variables, and regression analysis to predict the outcome of categorical dependent variables. A p value <0.05 was considered significant. In addition, the sensitivity, specificity, and predictive values of the ultrasound diagnostic criteria of MAP were calculated.

Results

Demographic data of 50 subjects with suspected MAP are presented in Table 1. Of the total subject population, 56% (28/50) had difficult placental separation, considerable blood loss (≥1500 cc), and received blood transfusion. Bilateral internal iliac artery ligation was performed to control bleeding in 28% (14/50) of subjects, intrauterine compression balloon with

Table 1. Preoperative and intraoperative data of subjects with suspected morbid adherent placenta

Variables	Total number of studied women=50
Age (years)	31.22±4.82*
Duration from last cesarean section (years)	3.4±2.39*
Gestational age at scan (weeks)	30.6±3.17*
Gestational age at delivery (weeks)	34.7±1.2*
Preoperative hematocrit	30.8±3.3*
48-h postoperative hematocrit	27.3±4.1*
Postoperative hematocrit drop	3.4±2.4*
Considerable intraoperative blood loss (≥1500 cc)	28 (56%) **
Intraoperative blood transfusion	28 (56%)**
Easy placental separation	22 (44%)**
Difficult placental separation	28 (56%)**
No need for additional surgical steps	22 (44%)**
Bilateral Internal Iliac Ligation	14 (28%)**
Emergency hysterectomy	11 (22%)**
Intrauterine compression balloon and placental bed sutures	3 (6%)**
Histopathology results of surgically removed uteri	
Placenta accreta	5 (10%)**
Placenta increta	4 (8%)**
Placenta percreta	2 (4%)**
Intraoperative bladder injury	5 (10%)**
*Data represented as Mean±SD; **Data represented as Number and percentage	

Table 2. Women who had difficult placental delivery and considerable intraoperative blood loss compared with women who did not have difficult placental delivery or considerable blood loss

Variables	Women who had difficult placental delivery and considerable intraoperative blood loss (number=28)	Women who did not have difficult placental delivery or considerable intraoperative blood loss (number=22)	p significance
Age (years) Mean±SD	30.3±5.2	30.9±4.1	0.13* (NS)
Body mass index (BMI), (kg/m^2) Mean±SD	25.3±3.2	24.7±2.9	0.32* (NS)
Parity Median (Range)	4 (1–6)	1 (1–2)	0.02** (S)
Number of previous cesarean section Median (Range)	3 (1–4)	1 (1–2)	0.04** (S)
Gestational age at delivery (weeks) Mean±SD	35.9±1.7	36.2±1.4	0.18* (NS)
*Analysis using independent student's t-test; **Analysis using Mann–Whitney's U-test. NS: non-significant; S: significant			

placenta bed sutures was performed in 6% (3/50) of subjects, and cesarean hysterectomy was performed in 22% (11/50) of subjects. Histopathological examination of surgically removed uteri showed placenta accreta in 10% (5/50) cases, placenta increta in 8% (4/50) cases, and placenta percreta in 4% (2/50 cases) cases. In total, 10% (5/50) cases of bladder injury were recorded during this study (Table 1).

The number of cesarean deliveries and parity were high among women who had difficult placental delivery, considerable intraoperative blood loss, and who required emergency hysterectomy to control bleeding (Table 2, 3).

Table 3. Women who required emergency hysterectomy to stop bleeding compared with women who did not require hysterectomy

Variables	Women who required emergency hysterectomy (number=11)	Women who did not require hysterectomy (number=39)	p significance
Age (years) Mean±SD	30.8±4.8	31.3±4.9	0.49* (NS)
Body mass index (BMI), (kg/m^2) Mean±SD	25.2±2.1	24.4±3.9	0.97* (NS)
Parity Median (Range)	4 (2–4)	2 (1–4)	0.02** (S)
Number of previous cesarean section Median (Range)	3 (1–4)	1 (1–2)	0.02** (S)
Gestational age at delivery (weeks) Mean±SD	36.1±1.3	36.9±1.2	0.33* (NS)

*Analysis using independent student's t-test **Analysis using Mann–Whitney's U-test.
NS: non-significant; S: significant

Observations of the loss of the retro-placental sonolucent space, irregular retro-placental sonolucent area, disruption of the uterine serosa-bladder interface, and exophytic mass invading the bladder by 2D gray-scale ultrasound were significantly high in women who had difficult placental separation and considerable intraoperative blood loss compared with women who did not have difficult placental separation or considerable blood loss (92.8%, 89.3%, 64.3%, and 28.6% vs. 31.8%, 22.7%, 9.1%, and 0%, respectively). Observations of the disruption of the uterine serosa-bladder interface, numerous vessels invading the uterine serosa-bladder interface, and crowded vessels over the peripheral sub-placental zone by the 3D power Doppler were significantly high in women who had difficult placental separation and considerable intraoperative blood loss compared with women who did not have difficult placental separation or considerable blood loss (78.6%, 78.6%, and 89.3% vs. 27.3%, 27.3%, and 27.3%, respectively). Observations of the disruption of the hyperechoic serosa-bladder interface, numerous coherent vessels invading the serosa-bladder interface, and crowded vessels over the peripheral sub-placental zone by the 3D MSV Doppler were also significantly high in women who had difficult placental separation and considerable intraoperative blood loss compared with women who did not have difficult placental separation or considerable blood loss (85.7%, 89.3%, and 89.3% vs. 9.1%, 9.1%, and 22.7%, respectively) (Table 4).

Observations of the loss of the retro-placental sonolucent space, irregular retro-placental sonolucent area, disruption of the uterine serosa-bladder interface, and exophytic mass invading the bladder by 2D gray-scale ultrasound were significantly high in women who required emergency hysterectomy compared with women who did not require hysterectomy (100%, 100%, 81.8%, and 36.4% vs. 33.3%, 30.8%, 17.9%, and 5.1%, respectively). Observations of the disruption of the uterine serosa-bladder interface, crowded vessels over the peripheral sub-placental zone, and abnormal placental lacunae by the 3D power Doppler were significantly high in women who required emergency hysterectomy compared with women who did not require hysterectomy (90.9%, 90.9%, and 90.9% vs. 20.5%, 30.8%, and 28.2%, respectively). Observations of the disruption of the hyperechoic serosa-bladder interface, crowded vessels over the peripheral sub-placental zone, and abnormal placental lacunae by the 3D MSV Doppler were also significantly high in women who required emergency hysterectomy compared with women who did not require hysterectomy (100%, 100%, and 100% vs. 28.2%, 38.5%, and 35.9%, respectively) (Table 5).

All gray-scale, power Doppler, and 3D MSV Doppler findings, except abnormal placental lacunae, had a significant positive correlation with difficult placental separation, considerable intraoperative blood loss, and emergency hysterectomy using Spearman's rank correlation coefficient. The best 2D gray-scale ultrasound parameters for the detection of difficult placental separation and considerable intraoperative blood loss in the subjects were abnormal placental lacunae (73.9% sensitivity), exophytic mass invading the bladder (100% specificity and 100% PPV), and loss of the retro-placental sonolucent space (74.2% NPV). The best 3D power Doppler parameters for the detection of difficult placental separation and considerable intraoperative blood loss in the subjects were crowded vessels over the peripheral sub-placental zone (79.6% sensitivity and 82.2% NPV) and disruption of the uterine serosa-bladder interface (82.2% specificity and 79.7% PPV). In addition, the best 3D MSV Doppler parameters for the detection of difficult placental separation and considerable intraoperative blood loss in the subjects were crowded vessels over the peripheral sub-placental zone (82.6% sensitivity and 84% NPV) and disruption of the uterine hyperechoic serosa-bladder area (85.2% Specificity and 81.1% PPV) (Table 6).

The best 2D gray-scale ultrasound parameters for the detection of hysterectomy in the subjects with MAP were disruption of the uterine serosa-bladder interface (81.8% sensitivity) and exophytic mass invading the bladder (94.9% specificity, 66.7% PPV, and 84.1% NPV). The best 3D power Doppler parameters for the

Table 4. 2D gray-scale, 3D power Doppler, and 3D MSV Doppler findings in women who had difficult placental separation and considerable intraoperative blood loss compared with women who did not have difficult placental separation or considerable intraoperative blood loss

Variables	Women who had difficult placenta separation and considerable intraoperative blood loss (number=28)	Women who did not have difficult placenta separation or considerable intraoperative blood loss (number=22)	p significance
2D gray-scale findings			
Loss of the retro-placental sonolucent space	26 (92.8%)	7 (31.8%)	0.03 (S)
Irregular retro-placental sonolucent area	25 (89.3%)	5 (22.7%)	0.01 (S)
Disruption of the uterine serosa-bladder interface	18 (64.3%)	2 (9.1%)	0.006 (S)
Exophytic mass invading the bladder	8 (28.6%)	0 (0%)	0.003 (S)
Abnormal placental lacunae	21 (75%)	14 (63.6%)	0.7 (NS)
3D power Doppler findings			
Disruption of the uterine serosa-bladder interface	22 (78.6%)	6 (27.3%)	0.02 (S)
Numerous vessels invading the serosa-bladder interface	22 (78.6%)	6 (27.3%)	0.02 (S)
Crowded vessels over the peripheral sub-placental zone	25 (89.3%)	6 (27.3%)	0.02 (S)
Abnormal placental lacunae	17 (65.7%)	15 (68.2%)	0.7 (NS)
3D MSV Doppler findings			
Disruption of the hyperechoic serosa-bladder interface	24 (85.7%)	2 (9.1%)	0.001 (S)
Numerous coherent vessels invading the serosa-bladder interface	25 (89.3%)	2 (9.1%)	0.001 (S)
Crowded vessels over the peripheral sub-placental zone	25 (89.3%)	5 (22.7%)	0.01 (S)
Abnormal placental lacunae	17 (65.7%)	14 (63.6%)	0.1 (NS)

Data represented as number and percentage; Analysis using chi-square (X^2) test.
NS: non-significant; S: significant; 2D: two-dimensional; 3D: three-dimensional; MSV: multislice view

detection of hysterectomy in the subjects were disruption of the uterine serosa-bladder interface (90.9% sensitivity, 68.8% specificity and 47% PPV) and crowded vessels over the peripheral sub-placental zone (93.2% NPV). In addition, the best 3D MSV Doppler parameters for the detection of hysterectomy were disruption of the hyperechoic serosa-bladder interface (100% sensitivity, 71.8% specificity, and 50% PPV) and crowded vessels over the peripheral sub-placental zone (100% NPV) (Table 7).
Logistic regression analysis showed that the observation of the risk of difficult placental separation and considerable intraoperative blood loss was increased 60 times with disruption of the hyperechoic serosa-bladder interface and 83 times with abnormal placental lacunae or numerous coherent vessels involving the serosa-bladder interface by the 3D MSV Doppler (Table 8).

Discussion

Hemorrhagic and surgical complications associated with MAP depend on the depth of placental invasion and involvement of adjacent structures (23). MAP with bladder invasion is a serious condition, which necessitates proper antenatal diagnosis and an appropriate management strategy (24).

A past history of cesarean delivery and placenta previa are the two risks for MAP, and the incidence of MAP is increased concomitantly with increased cesarean section rates (3, 25-27). Antenatal diagnosis of MAP is crucial for proper counseling for possible surgical complications, multidisciplinary team care, and recruitment (3). Recently, MRI has also been proposed as a diagnostic modality with promising results for the detection of MAP. Despite its cost and unavailability in many centers, MRI should be reserved for cases with inconclusive sonographic findings (13, 15, 17).
Recently, 3D ultrasound and the 3D power Doppler have been introduced for the detection of MAP, and MSV technology was introduced in 2004 (28). MSV represents the sequential sections of the scanned ROI, similar to MRI technology. Scanned ROI can be rotated and slices can be changed to obtain the best plane for analysis. The 3D MSV Doppler was previously used in the diagnosis of uterine anomalies and in the prenatal diagnosis of the fetal facial, heart, and central nervous system anomalies (20).
Fifty women at ≥28 weeks gestation with suspected MAP (placenta previa anterior covering the scar of the previous cesarean section) were included in this study and scanned with 2D

Table 5. 2D gray-scale, 3D power Doppler, and 3D MSV Doppler findings in women who required emergency hysterectomy to stop bleeding compared with women who did not require hysterectomy

Variables	Women who required emergency hysterectomy (number=11)	Women who did not require hysterectomy (number=39)	p significance
2D gray-scale findings			
Loss of the retro-placental sonolucent space	11 (100%)	13 (33.3%)	0.03 (S)
Irregular retro-placental sonolucent area	11 (100%)	12 (30.8%)	0.02 (S)
Disruption of the uterine serosa-bladder interface	9 (81.8%)	7 (17.9%)	0.01 (S)
Exophytic mass invading the bladder	4 (36.4%)	2 (5.1%)	0.02 (S)
Abnormal placental lacunae	8 (72.7%)	26 (66.7%)	0.8 (NS)
3D power Doppler findings			
Disruption of the uterine serosa-bladder interface	10 (90.9%)	8 (20.5%)	0.008 (S)
Numerous vessels invading the serosa-bladder interface	6 (54.5%)	24 (61.5%)	0.8 (NS)
Crowded vessels over the peripheral sub-placental zone	10 (90.9%)	12 (30.8%)	0.04 (S)
Abnormal placental lacunae	10 (90.9%)	11 (28.2%)	0.03 (S)
3D MSV Doppler findings			
Disruption of the hyperechoic serosa-bladder interface	11 (100%)	11 (28.2%)	0.01 (S)
Numerous coherent vessels invading the serosa-bladder interface	8 (72.7%)	25 (64.1%)	0.8 (NS)
Crowded vessels over the peripheral sub-placental zone	11 (100%)	15 (38.5%)	0.06 (S)
Abnormal placental lacunae	11 (100%)	14 (35.9%)	0.04 (S)

Data represented as number and percentage, analysis using chi-square (X^2) test.
NS: non-significant; S: significant; 2D: two-dimensional; 3D: three-dimensional; MSV: multislice view

Table 6. Accuracy of 2D gray-scale, 3D power Doppler, and 3D MSV Doppler parameters in the prediction of difficult placental separation and considerable intraoperative blood loss

Variables	Sensitivity	Specificity	PPV	NPV
2D gray-scale findings				
Loss of the retro-placental sonolucent space	70%	59.3%	64.%	74.2%
Irregular retro-placental sonolucent area	72.6%	63%	65.5%	71%
Disruption of the uterine serosa-bladder interface	43.5%	88.9%	76.9%	64.9%
Exophytic mass invading the bladder	26.1%	100%	100%	61.4%
Abnormal placental lacunae	73.9%	37%	50%	62.5%
3D power Doppler findings				
Disruption of the uterine serosa-bladder interface	77.2%	82.2%	79.7%	79.9%
Numerous vessels invading the serosa-bladder interface	71.3%	69.4%	65.1%	76.2%
Crowded vessels over the peripheral sub-placental zone	79.6%	71.8%	73%	82.2%
Abnormal placental lacunae	65.6%	36.5%	42.1%	56.8%
3D MSV Doppler findings				
Disruption of the hyperechoic serosa-bladder interface	78.3%	85.2%	81.8%	82.1%
Numerous coherent vessels the invading serosa-bladder interface	78.3%	70.4%	69.2%	79.2%
Crowded vessels over the peripheral sub-placental zone	82.6%	77.8%	76%	84%
Abnormal placental lacunae	69.6%	37%	48.5%	58.5%

Data represented as percentage.
PPV: positive predictive value; NPV: negative predictive value; 2D: two-dimensional; 3D: three-dimensional; MSV: multislice view

gray-scale ultrasound, power Doppler, and 3D MSV Doppler to confirm the diagnosis of MAP. Intraoperative findings and histopathology results of the removed uteri were compared with preoperative sonography findings to evaluate the accuracy of the 3D MSV Doppler in the diagnosis of MAP. Of the total subject population, 46 were delivered at 35 weeks by planned cesar-

Table 7. Accuracy of 2D Gray-Scale, 3D power Doppler, and 3D MSV Doppler parameters in the prediction of hysterectomy

Variables	Sensitivity	Specificity	PPV	NPV
2D gray-scale findings				
Loss of the retro-placental sonolucent space	70%	48.7%	35.5%	70%
Irregular retro-placental sonolucent area	70%	53.8%	37.9%	70%
Disruption of the uterine serosa-bladder interface	81.8%	82.1%	56.3%	84.1%
Exophytic mass invading the bladder	63.4%	94.9%	66.7%	84.1%
Abnormal placental lacunae	72.7%	33.3%	23.5%	81.3%
3D power Doppler findings				
Disruption of the uterine serosa-bladder interface	90.9%	68.8%	47%	90.8%
Numerous vessels invading the serosa-bladder interface	90.9%	60.5%	40.3%	92.2%
Crowded vessels over the peripheral sub-placental zone	90.9%	61.1%	41%	93.2%
Abnormal placental lacunae	62.7%	32.9%	21.2%	82.4%
3D MSV Doppler findings				
Disruption of the hyperechoic serosa-bladder interface	100%	71.8%	50%	100%
Numerous coherent vessels invading the serosa-bladder interface	100%	61.5%	42.3%	100%
Crowded vessels over the peripheral sub-placental zone	100%	64.1%	44%	100%
Abnormal placental lacunae	72.7%	35.9%	24.2%	82.4%

Data represented as percentage.
PPV: positive predictive value; NPV: negative predictive value; 2D: two-dimensional; 3D: three-dimensional; MSV: multislice view

Table 8. Logistic regression analysis of 2D gray-scale, 3D power Doppler, and 3D MSV Doppler parameters as predictors of difficult placental separation and considerable intraoperative blood loss

Ultrasound technique	Parameters	Difficult placental separation and considerable intraoperative blood loss	Odds ratio (95% confidence interval)
2D gray-scale	Loss of the retro-placental sonolucent space	26/7 2/15	27.8 (5.1–151.7)
	Irregular retro-placental sonolucent area	25/5 3/17	28.3 (5.9–134.6)
	Disruption of the uterine serosa-bladder interface	18/2 10/20	18 (3.5–93.4)
	Exophytic mass invading the bladder	8/0 20/22	18.6 (1.01–343.9)
	Abnormal placental lacunae	21/14 7/8	1.7 (0.50–5.80)
3D power Doppler	Disruption of the uterine serosa-bladder interface	22/6 6/16	9.7 (2.6–35.9)
	Abnormal placental lacunae	22/6 6/16	9.7 (2.6–35.9)
	Numerous vessels invading the serosa-bladder interface	22/6 6/16	9.7 (2.6–35.9)
	Crowded vessels over the peripheral sub-placental zone	17/15 11/7	0.7 (0.2–2.3)
3D MSV Doppler	Disruption of the hyperechoic serosa-bladder interface	24/2 4/20	60 (9.9–362.3)
	Abnormal placental lacunae	25/2 3/20	83.3 (12.6–547.9)
	Numerous coherent vessels invading the serosa-bladder interface	25/2 3/20	83.3 (12.6–547.9)
	Crowded vessels over the peripheral sub-placental zone	17/14 11/8	0.8 (0.2–2.7)

2D: two-dimensional; 3D: three-dimensional; MSV: multislice view

ean section, while four were delivered at 33 weeks because of antepartum hemorrhage. In this study, parity and the number of previous cesarean sections were significantly high among women who had difficult placental delivery, considerable intraoperative blood loss, who required emergency hysterectomy to control bleeding. Wright et al. (29) found that 41.7% of women with a known placenta accreta had a blood loss of ≥5000 mL, and, although Wright et al. (29) concluded that there was no significant relation between parity, number of previous cesarean deliveries, degree of placental invasion, and massive blood loss, Tikkanen et al. (30) found that the risk factors of placenta accreta included parity, cesarean section, and placenta previa. In addition, Guleria et al. (31) concluded that the risk factors of abnormal invasive placentation (AIP) were placenta previa and a past history of cesarean delivery, and Thia et al. (32) concluded that the depth of invasion in MAP is increased with multiple previous surgeries or excessive curettage or infection causing defective decidua basalis. D'Antonio et al. (16) concluded that the incidence of AIP increased in the past decades as a consequence of increasing caesarean section rates, and ultrasound has 91% sensitivity and 97% specificity for the prediction of all forms of AIP. Bilateral internal iliac artery ligation was needed in 28% (14/50) of the subjects, intrauterine compression balloon with placenta bed sutures was needed in 6% (3/50) of the subjects, and cesarean hysterectomy was performed in 22% (11/50) of the subjects. Warshak et al. (33) reviewed 99 women with pathologically confirmed placenta accreta. Warshak et al. (33) concluded that antenatal detection of placenta accreta was associated with a significant decrease in maternal hemorrhage. In addition, Tikkanen et al. (30) concluded that the diagnosis of placenta accreta may significantly reduce peripartum blood loss, and Chantraine et al. (34) concluded that the prenatal diagnosis of AIP reduces morbidity and undiagnosed cases of AIP led to more emergency hysterectomies (33, 30, 34).

Eller et al. (35) concluded that planned cesarean hysterectomy and preoperative ureteric stents were associated with reduced maternal morbidity in MAP.

In this study, the best 2D gray-scale ultrasound parameters for the detection of difficult placental separation and considerable intraoperative blood loss were abnormal placental lacunae (73.9% sensitivity), exophytic mass invading the bladder (100% specificity & 100% PPV), and loss of the retro-placental sonolucent zone (74.2% NPV). In addition, the best 2D gray-scale ultrasound parameters for the detection of emergency hysterectomy in the subjects were disruption of the hyperechoic uterine serosa-bladder interface (81.8% sensitivity) and exophytic mass invading the bladder (94.9% specificity, 66.7% PPV, and 84.1% NPV).

Thirty-two women were included in the study conducted by Dwyer et al. (15) that was conducted to compare the accuracy of trans-abdominal ultrasound and MRI for the diagnosis of placenta accreta. Sonography correctly identified placenta accreta with 93% sensitivity (14/15 cases) and ruled out placenta accreta with 71% specificity (12/17 cases), whereas MRI correctly identified placenta accreta with 80% sensitivity (12/15 cases) and ruled out placenta accreta with 65% specificity (11/17 patients cases) (15). Warshak et al. (13), found that ultrasound accurately diagnosed MAP with 77% sensitivity (30/39) and ruled out MAP with 96% specificity (398/414) and concluded that MRI may be helpful in the diagnosis of MAP in cases with equivocal or inconclusive ultrasound findings. A See comment in PubMed Commons belowlarge prospective study of gray-scale ultrasound for the diagnosis of MAP was conducted by Comstock et al. (36) to detect the accuracy of ultrasound in the detection of placenta accreta in high-risk patients. Although Comstock et al. (36) concluded that multiple vascular spaces inside the placenta (placental lacunae) was the most notable diagnostic sign for placenta accreta with high PPV and obliteration of retro-placental area is not a reliable sign for the diagnosis of placenta accreta, Wong et al. (37), concluded that the loss of the placental-uterine interface and the presence of abnormal vessels crossing this interface were the most specific criteria to diagnose MAP using 2D gray-scale ultrasound scan. Comstock et al. (36) found that the absence of the space between the placenta and myometrium is not a diagnostic sign for MAP because the space may be normally absent without MAP. They recommended the use of the color Doppler to identify placental sinuses crossing the uterine wall to the bladder.

In this study, the best 3D power Doppler parameters for the detection of difficult placental separation and considerable intraoperative blood loss in the subjects were crowded vessels over the peripheral sub-placental zone (79.6% sensitivity and 82.2% NPV) and disruption of the hyperechoic serosa-bladder interface (82.2% specificity and 79.7% PPV). In addition, the best 3D power Doppler parameters for the detection of emergency hysterectomy in the subjects were disruption of the uterine serosa-bladder interface (90.9% sensitivity, 68.8% specificity and 47% PPV) and crowded vessels over the peripheral sub-placental zone (93.2% NPV). Thirty cases of placenta previa were studied by Moodley et al. (17), and they found that two (66.6%) cases required caesarean hysterectomy and one (33.3%) case required internal iliac ligation to control bleeding. They concluded that the color flow Doppler was more specific in the diagnosis of MAP than MRI with 95% NPV (17). Zhang et al. (14) found that the color Doppler had 77.3% (17/22) sensitivity, 98.4% (189/192) specificity, 85.0% (17/20) PPV, and 97.4% (189/194) NPV in the diagnosis of placenta previa increta. Zhang et al. (14) concluded that the prenatal color Doppler ultrasound has a high sensitivity and specificity for the identification of placenta previa increta. Japaraj et al. (38) found that the prominent gray-scale ultrasound sign to diagnose placenta accreta was dilated vessels extending from the placenta to myometrium, and the most prominent color Doppler sign to diagnose placenta accreta was abnormal vessels connecting the placenta to bladder. In addition, Shi et al. (39) found that the most prominent gray-scale sign to diagnose placenta accreta was dilated vessels extending from the placenta to the myometrium, and the most prominent color Doppler diagnostic sign was the presence of abnormal vessels connecting the placenta to the bladder. Shi et al. (40) found that numerous vessels observed by the 3D power Doppler was the best single diagnostic sign of placenta accreta, with 97% sensitivity, and they concluded that the 3D power Doppler is a useful tool for the diagnosis of MAP. Chou et al. (12) found that the color Doppler had 82.4% (14/17) sensitivity, 96.8%

(61/63) specificity, 87.5% (14/16), and 95.3% (61/64) positive and negative predictive values. Chou et al. (23), in another study, found a strong association between bladder invasion in MAP and 3D power Doppler findings, particularly hypervascularization of the uterine serosa-bladder interface and large rosette of varicosities in the area of bladder base. Chou et al. (23), concluded that 3D ultrasound can be used as an adjunctive tool with 2D ultrasound to identify the extent of invasion in cases of MAP. The advantages of 3D ultrasound are as follows: 1. Multiplanar image display (sagittal, coronal, and axial planes at the same time) and 2. Viewing planes of vasculature can be manipulated to identify vessels invading the bladder (23). In addition, Cali et al. (41) found that irregular tortuous vessels affecting the entire placenta and the uterine serosa-bladder interface were the diagnostic signs of MAP observed by the 3D power Doppler.

This study was the first study to evaluate the accuracy and advantages of the 3D MSV Doppler over the 3D power Doppler in the prenatal diagnosis of MAP. The advantages gained by MSV were as follows:

1. Multiplanar mode allows one to achieve standardized views in the acquisition plane (A plane) by rotating reconstructed planes (B and C planes),

2. Comparing several slices displayed on the same screen to obtain the most informative image that can confirm the diagnosis obtained by 2D gray-scale ultrasound (20).

The sensitivity and NPV (79.6% and 82.2%, respectively) of crowded vessels over the peripheral sub-placental zone to detect difficult placental separation and considerable intraoperative blood loss in the subjects with MAP using the 3D power Doppler were increased to 82.6% and 84%, respectively, using the 3D MSV Doppler. In addition, the specificity and PPV (82.2% and 79.7%, respectively) of the disruption of the uterine serosa-bladder interface to detect difficult placental separation and considerable intraoperative blood loss using the 3D power Doppler was increased to 85.2% and 81.1%, respectively, using the 3D MSV Doppler (this difference was statistically insignificant). The sensitivity, specificity and PPV (90.9%, 68.8%, and 47%, respectively) of disruption of the uterine serosa-bladder interface for the detection of emergency hysterectomy in the subjects with MAP using the 3D power Doppler were increased to 100%, 71.8%, and 50%, respectively using the 3D MSV Doppler. The NPV (93.2%) of crowded vessels over the peripheral sub-placental zone for the detection of emergency hysterectomy using the 3D power Doppler was increased to 100% using the 3D MSV Doppler, (this difference was statistically insignificant). Two women who were afraid of a loss of their privacy and thus refused to participate in this study and small published data about the use of the 3D MSV Doppler in MAP were the limitations faced during this study.

In conclusion, the 3D MSV Doppler increased the predictive value of the diagnostic criteria of MAP compared with the 3D power Doppler, although this increase was not significant. More randomized studies with higher power are necessary to conclude this type of adjunctive use.

Ethics Committee Approval: *Ethics committee approval was received for this study from the ethics committee of Ain Shams University Maternity Hospital, Cairo, Egypt.*

Informed Consent: *Written informed consent was obtained from patients who participated in this study. Peer-review: Externally peer-reviewed.*

Author Contributions: *Concept - A.M.A.; Design - A.I., S.A.A.; Supervision - A.I., S.A.A.; Resource - I.A.A., A.M.A.; Materials - L.A., A.M.A.; Data Collection and/or Processing - A.M.A., I.A.A.; Analysis and/or Interpretation - I.A.A., A.M.A.; Literature Search - I.A.A., A.I.; Writing - A.M.A.; Critical Reviews - S.A.A., A.I.*

Acknowledgements: *Authors are grateful to all women agreed to participate in this study.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Diagnostic and prognostic evaluation of fluorodeoxyglucose positron emission tomography/computed tomography and its correlation with serum cancer antigen-125 (CA125) in a large cohort of ovarian cancer patients

Laura Evangelista[1], Maurizia Dalla Palma[2], Michele Gregianin[1], Margherita Nardin[3], Anna Roma[2], Maria Ornella Nicoletto[2], Giovanni Battista Nardelli[4], Vittorina Zagonel[2]

[1]Radiotherapy and Nuclear Medicine Unit, Istituto Oncologico Veneto IOV – IRCCS, Padova, Italy

[2]Medical Oncology Unit, Istituto Oncologico Veneto IOV – IRCCS , Padova, Italy

[3]Oncological Radiology Unit, Istituto Oncologico Veneto IOV – IRCCS , Padova, Italy

[4]Department of Gynecological Sciences and Human Reproduction, University of Padova, Padova, Italy

Abstract

Objective: We evaluated the efficacy of 18F-fluorodeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT) in recurrent disease, response to therapy, and long-term follow-up of ovarian cancer (OC) patients in relation to cancer antigen-125 (CA125) levels and the prognostic meaning of this modality in this subset of subjects.

Material and Methods: Between 2005 and 2015, we retrospectively evaluated 125 patients affected by OC who underwent FDG PET/CT imaging at our institution. The indications for PET/CT were recurrence of disease in 78 patients, therapy response assessment in 29, and follow-up in 18. The results of FDG PET/CT were compared with those of histopathology and clinical and radiological progression during follow-up for at least 6 months. The median long-term follow-up was 33 months. The diagnostic accuracies for the different clinical settings were evaluated. The relationships among global survival (GS), FDG PET/CT results, and CA125 levels were evaluated by both Kaplan–Meier and Cox regression analysis.

Results: CA125 results were positive (>35 UI/mL) in 62 patients and negative in 63 (49% vs. 51%). The sensitivity and specificity of CA125 were 72% and 91%, respectively. PET/CT imaging showed a sensitivity of 98.6% and a specificity of 77.8% for the assessment of recurrent disease, and a sensitivity of 72.7% and a specificity of 88.9% for therapy evaluation. Meanwhile, in 18 patients evaluated during follow-up, the specificity was 82.3%. GS was significantly higher in case of negative CA125 values at the time of FDG PET/CT, of a negative PET/CT scan and when no evidence of peritoneum recurrence and distant metastases was determined by PET. Multivariate regression analysis showed that only age and peritoneum recurrence as determined by PET were identified as independent predictors of poor prognosis.

Conclusion: Metabolic imaging with FDG PET/CT proved useful in patients where OC recurrence was suspected, even when the value of tumor marker CA125 was in a normal range. A positive PET/CT scan and the presence of peritoneum recurrence at PET were associated with a poor prognosis after approximately 30 months. (J Turk Ger Gynecol Assoc 2015; 16: 137-44)

Keywords: Ovarian cancer, FDG-PET/CT, CA125, disease-free survival, overall survival.

Received: 26 May, 2015 **Accepted:** 16 July, 2015 **Available Online Date:** 06 August, 2015

Introduction

Ovarian cancer (OC) accounts for approximately 3% of cancers in women; 125,000 women are estimated to die of the disease each year. OC is curable when identified at an early stage. However, because there is no effective screening test for this tumor and its symptoms are vague, approximately 70–80% of patients are diagnosed at an advanced stage of the disease (stage III and IV, in accordance with the International Federation of Gynecology and Obstetrics (FIGO)); this means that the survival rate is low (1). More than 70% of stage III-IV patients have a relapse of the disease, and even in stage I or II, the relapse rate is 20–25% (2). The serial evaluation of serum cancer antigen-125 (CA125) can be useful to non-invasively detect the recurrence of disease because an elevation in CA125 levels can determine the presence of disease with a high accuracy of 79% to 95%, thus preceding a clinically apparent recurrence by 3 to 6 months (3, 4). However, normal CA125 levels cannot exclude the presence of recurrent

Address for Correspondence: *Laura Evangelista, Radiotherapy and Nuclear Medicine Unit, Istituto Oncologico Veneto IOV – IRCCS , Padova, Italy. Phone: +39 0498217997 e.mail: laura.evangelista@ioveneto.it*

DOI:10.5152/jtgga.2015.15251

Table 1. Characteristics of patients

Characteristics	
Median age (range), years	**56 (18–82)**
Stage at diagnosis, n (%)	
I	20 (16.0)
II	13 (10.4)
III	72 (57.6)
IV	9 (7.2)
Unknown	11(8.8)
Histology, n (%)	
Papillary serous adenocarcinoma	78 (62.4)
Endometroid adenocarcinoma	11 (8.8)
Mucinous adenocarcinoma	4 (3.2)
Clear cell carcinoma	5 (4.0)
Ovarian sex cord tumors	7 (5.6)
Transitional cell carcinoma	1 (0.8)
Borderline	7 (5.6)
Poorly differentiated adenocarcinoma	1 (0.8)
Ovarian sarcoma	2 (1.6)
Neuroendocrine	1 (0.8)
Unknown	8 (6.4)
Grade, n (%)	
G1	10 (8.0)
G2	31 (24.8)
G3	69 (55.2)
Unknown	15 (12.0)

disease. Once an increase in CA125 levels is documented, oncologists or clinicians usually request additional imaging studies to identify the site of recurrence and thus choose the best treatment strategy. In this regard, it has been demonstrated that 18F-fluorodeoxyglucose (FDG) positron emission tomography (PET)/computed tomography (CT) is able to detect the early recurrence of disease, even when CA125 levels are in the normal range or are minimally elevated (5, 6). Nevertheless, data concerning the relationship between prognosis and FDG PET/CT in this group of patients remain indeterminate. Kurosaki et al. (7) demonstrated that the 2-year survival rate was more favorable in patients with a negative PET/CT scan than in those with a positive finding.

In the present study, we aimed to evaluate 1) the efficacy of FDG PET/CT in the recurrence of disease, response to therapy, and long-term follow-up of OC patients by comparing CA125 levels and 2) the prognostic meaning of this modality in this subset of subjects.

Material and Methods

Between 2005 and 2015, we retrospectively evaluated 125 patients affected by OC who underwent FDG PET/CT imaging at our institution. The indications for PET/CT were recurrence of disease, therapy response assessment, and follow-up. Clinical, demographic, and imaging information were collected from the patients' charts. According to the institutional guidelines, approval from the local ethical committee was not required (in accordance with the nature of the study). However, all patients gave their written consent for treatments and imaging examination.

FDG-PET/CT imaging and analysis

Whole-body FDG PET/CT was performed using a dedicated scanner (Biograph 16, Siemens Medical Solutions, Hoffman Estates, Illinois, United States) upgraded with high-definition software. Fasting for at least 6 h was required before the examination. After the injection of approximately 3 MBq of FDG per kg of body weight, patients rested for a period of approximately 60 min. Emission images from the base of the skull to the mid-thigh were acquired for 2–3 min per bed position. For the assessment of the images, we defined the presence of increased FDG uptake outside from the physiological sites as a positive PET/CT scan. In contrast, the absence of significant FDG uptake outside the heart, mediastinal blood pool, stomach, bowel, bladder, and kidney defined as a negative scan. Finally, semiquantitative analysis was performed for each lesion using the maximum standardized uptake value (SUVmax) by drawing a volume of interest (VOI) around suspected lesion sites.

Gold standard and follow-up data

Diagnoses were verified by clinical follow-up and imaging studies (chest X-rays, CT, bone scans, abdominal ultrasounds, nuclear magnetic resonance, and FDG PET). The diagnosis of the metastatic disease was made when the presence of new lesions at clinical evaluations and/or from imaging studies was demonstrated. In patients without disease relapse, neither a change in ongoing treatment nor further treatment was performed, and a close follow-up with imaging studies was started.

Follow-up examinations and clinical visits were conducted in the Nuclear Medicine/Oncology Radiology Unit and in the Oncology 1 Unit of our institute, respectively.

Global survival (GS) was defined as the length of time from the date of PET/CT to death from any cause. The mean follow-up period was 33 months (range: 1–110). During this observational period, some patients were treated by surgery (n=13), systemic therapy (chemotherapy or hormonal therapy), or radiotherapy (n=49).

Statistical analysis

The performance of FDG PET/CT scans was calculated on the basis of per-patient and per-lesion analysis using the standard method. Continuous data were expressed as mean±standard deviation or median (range) and nominal data as number (percentage). The ANOVA test was used for defining the difference among and between subsets of patients. Receiver operating characteristic (ROC) analysis and area under curve (AUC) were computed to define the cutoff value of CA125 for determining a positive PET/CT scan. Kaplan–Meier analysis and log-rank tests were used to compare different parameters

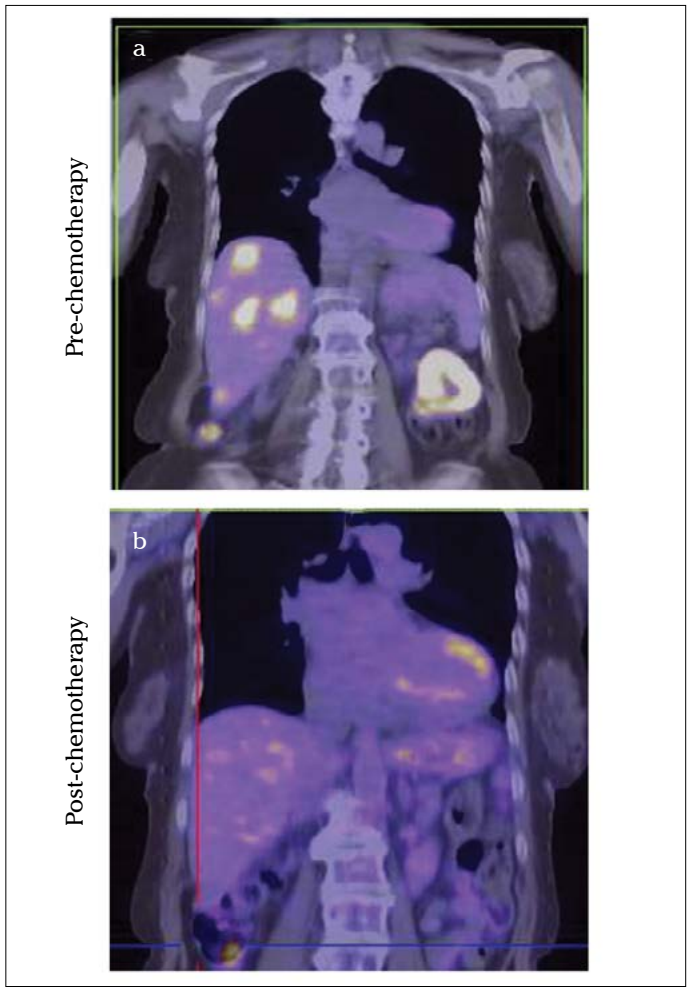

Figure 1. a, b. FDG PET/CT in a 72-year-old woman with recurrent ovarian cancer (FIGO stage IIIC, grade 3 serous papillary ovarian carcinoma, post-hysterectomy, bilateral oophorectomy, and chemotherapy completed 4 years before) presenting with increased CA125 level (150 UI/L) and an uncertain ultrasonography result. Coronal fusion image (a) showed abnormal FDG uptake in the liver and in the left quadrant of the abdomen. The patient underwent 6 cycles of chemotherapy with Caelyx and Oxaliplatin. Seven months later, another FDG PET/CT scan showed the resolution of metabolic activity in the liver and abdomen (b) compatible with a good response to therapy

(e.g., positive vs. negative PET/CT or negative CA125 vs. positive CA125, etc.). Moreover, Cox proportional hazards regression analysis was used to identify independent variables associated with a worse GS. A multivariate analysis was built using variables that showed a value of 0.1 in the univariate model. Statistical analysis was performed using SPSS software for Windows, version 15.0 (SPSS, Chicago, Illinois, United States).

Results

The characteristics of the patients are reported in Table 1. More than 70% of the patients were at advanced stages (III-IV according to the FIGO) and had aggressive cancer

Table 2. Accuracies of CA125 and PET/CT in all study populations

	CA125	FDG PET/CT
Sensitivity, CI 95%	71.6 (61.8–81.4)	95.1 (90.3–99.8)
Specificity, CI 95%	90.9 (82.4–99.4)	84.1 (73.3–94.9)
PPV, CI 95%	93.5 (88.2–98.9)	91.7 (85.6–97.7)
NPV, CI 95%	63.5 (49.3–77.8)	90.2 (81.5–99.1)
Accuracy, CI 95%	78.4 (71.2–85.6)	91.2 (86.2–96.2)

PPV: positive predictive value; NPV: negative predictive value; CI: confidence interval; CA: cancer antigen
FDG PET/CT: fluorodeoxyglucose positron emission tomography/computed tomography

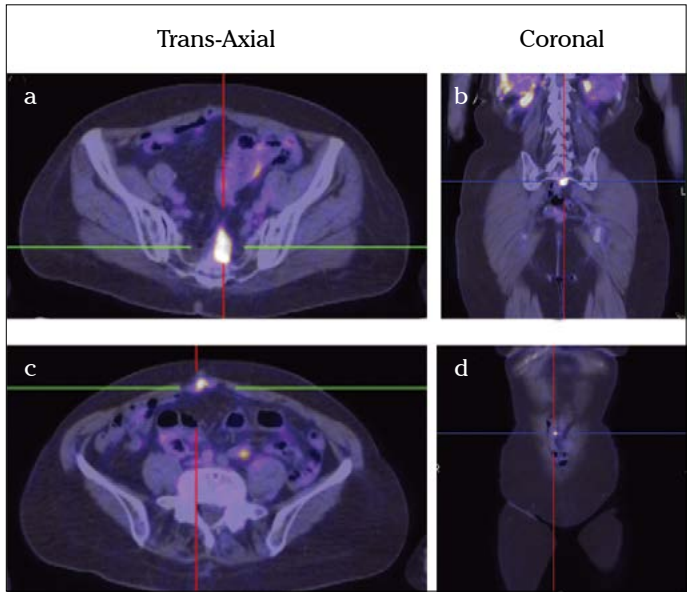

Figure 2. a-d. Axial (a, c) and coronal (b, d) FDG PET/CT in a 45-year-old female with a stage III papillary serous adenocarcinoma with invasive peritoneal implants

(grade 3; n=69). All patients underwent PET/CT, 78 for relapse assessment (Figure 1a, b), 29 for assessment after primary therapy, and 18 for long-term follow-up. The median period between the last chemotherapy and PET/CT used to determine treatment efficacy (n=29 patients) was 4 months (1–8 months). The period between the last treatment and the FDG PET/CT scan was 17 months (1–103). In 81 patients (65%), the recurrence of disease was pathologically and clinically confirmed. For the evaluation of recurrence, CT was performed on 63 patients, abdominal ultrasonography on 8, pelvic magnetic resonance imaging on 3, bone scan on 1, and clinical evaluation (both CA125 and histological evaluation) in the remaining 50 patients.

FDG PET/CT and CA125 findings

The CA125 level at the time of the PET/CT scan was available for all patients (median value: 60 UI/mL; range: 4 to 5777 UI/mL): in 62 patients the result was positive (i.e., >35 UI/mL), and in 63 patients the result was negative. The median time between CA125 evaluation and PET/CT was 2 months (1 to 3

Table 3. Accuracies of CA125 and PET/CT in 96 patients

	Assessment relapse (n=78)		Follow-up (n=18)	
	CA125	FDG PET/CT	CA125	FDG PET/CT
Sensitivity, CI 95%	73.9 (63.5–84.2)	98.6 (95.7–100)	-	100
Specificity, CI 95%	88.9 (68.4–100)	77.8 (50.6–100)	100	82.3 (64.7–99.9)
PPV, CI 95%	98.1 (94.8–100)	97.1 (93.2–100)	-	25.0 (5.0–45.5)
NPV, CI 95%	30.8 (6–61)	87.5 (65.9–100)	94.4 (83.6–100)	100
Accuracy, CI 95%	75.6 (66.1–85.2)	96.1 (91.8–100)	94.4 (83.6–100)	83.3 (66.1–100)

PPV: positive predictive value; NPV: negative predictive value; CI: confidence interval; CA: cancer antigen
FDG PET/CT: fluorodeoxyglucose positron emission tomography/computed tomography

Table 4. Accuracies of CA125 and PET/CT in 29 patients

	Assessment relapse after treatment (n=29)	
	CA125	FDG PET/CT
Sensitivity, CI 95%	63.6 (35.2–92)	98.6 (95.7–100)
Specificity, CI 95%	83.3 (66.1–100)	77.8 (50.6–100)
PPV, CI 95%	70 (42.9–97)	97.1 (93.2–100)
NPV, CI 95%	78.9 (60.1–97.8)	87.5 (65.9–100)
Accuracy, CI 95%	75.9 (60.3–91.4)	96.1 (91.8–100)

PPV: positive predictive value; NPV: negative predictive value; CI: confidence interval; CA: cancer antigen
FDG PET/CT: fluorodeoxyglucose positron emission tomography/computed tomography

months). The CA125 results were true positive in 58 patients (72%) and true negative in 40 patients (91%). The sensitivity, specificity, and diagnostic accuracy of the CA125 values were 72%, 91%, and 78%, respectively (Table 2). PET/CT yielded a positive finding in 84 patients (67%); in particular, it gave true positive results in 77 patients (95%) and false positive results in 7 patients (8%) (Table 2). In the latter patients, PET/CT showed chronic abdomen inflammation (n=4), bronchitis (n=2), abnormal liver uptake due to the presence of hemangioma (n=1), and adrenal functional adenoma (n=1). The PET/CT result was true negative in 37 patients (84%) and false negative in 4 patients. Specifically, PET/CT missed an instance of liver disease that was detected by CT scan and later histologically confirmed; two micro-metastases (diameter <1 cm) of the lung and liver; and two cases of recurrent borderline OC (Figure 2 a-d). The concordance between CA125 and PET/CT demonstrated that 55 patients had positive findings from both methods; however, 29 patients with negative CA125 values had positive PET/CT scans. 22 out of these 29 patients had true positive PET findings; thus, PET/CT identified recurrence of disease in 35% of patients where recurrence was not indicated by CA125 value. The highest accuracy (95%) was found when PET/CT and positive CA125 were associated, although a low negative predictive value was demonstrated (57%). In patients with a positive PET/CT scan, CA125 values were higher than in those with a negative scan (284.39±723.54 vs. 66.77±251.44 UI/mL, respectively), but the results were not statistically significant (p=0.087). A CA125 value of 32.5 U/mL was considered as an optimal cut-off value for predicting a positive PET/CT scan (AUC 0. 829, p<0.001; sensitivity: 76% and specificity: 80%). The introduction of FDG PET/CT in the diagnostic flowchart of all 125 patients changed the management in 52 patients (41.6%), particularly those evaluated for the recurrence of disease (n=40/78; 51.2%).

FDG PET/CT and CA125 findings in 96 patients with relapse

Table 3 reports the diagnostic accuracies of CA125 and PET/CT in patients evaluated for the assessment of relapse and in follow-up. As illustrated, the sensitivities were higher for PET/CT compared to CA125, although the specificities and accuracy were higher for CA125 in both subsets and in the follow-up subset.

FDG PET/CT and CA125 findings in 29 patients with relapse after treatment

By analyzing the diagnostic accuracy of CA125 and PET/CT in 29 patients examined after treatment, FDG PET/CT was more accurate, both in terms of sensitivity and accuracy, than CA 125 (Table 4). However, the specificity of CA 125 was higher than that of PET/CT. The latter result could be due to possible residual inflammation after therapy that can be associated with a higher number of false positive results.

PET/CT and lesion site analysis

52 patients showed suspicious findings by PET/CT for peritoneal carcinomatosis, which was histologically confirmed in 50 of the patients. 43 patients with peritoneal carcinomatosis underwent PET/CT for the assessment of relapse, while 7 underwent PET/CT for the assessment of relapse after treatment. Furthermore, 41 patients had a positive PET/CT result for lymph node disease (15 loco-regional, 13 distant, and 13 loco-regional and distant lymph nodes), in particular 39 subjects evaluated by PET/CT for the assessment of recurrence and 2 subjects evaluated after therapy. PET/CT falsely identified 1 patient with loco-regional lymph node disease and 1 with distant lymph node metastases. Visceral metastases were found by PET/CT in the liver and lungs in 16 and 7 patients, respectively (both liver and lung metastases were found in subjects evaluated for the recurrence of disease, while liver disease was also reported in patients evaluated

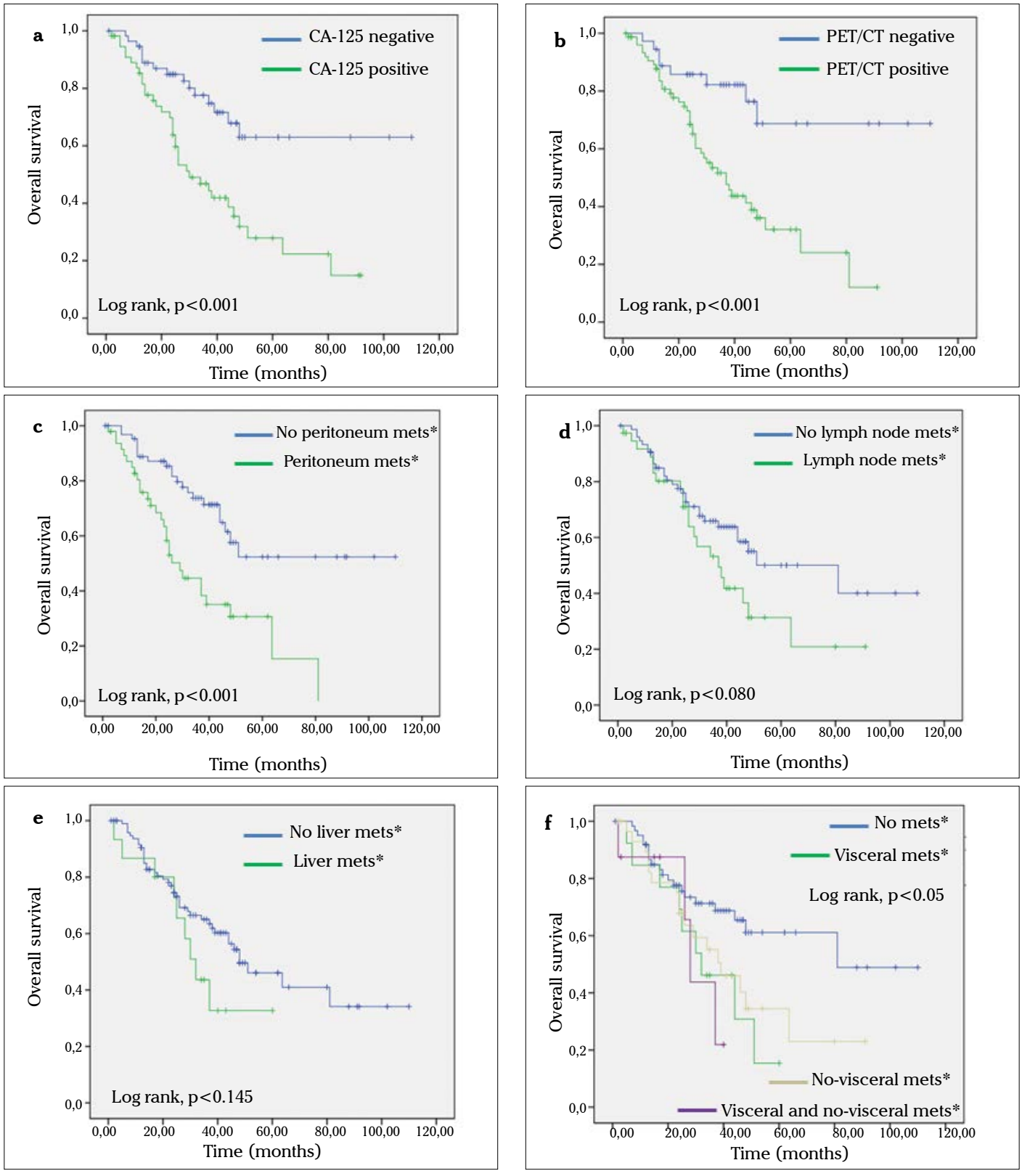

Figure 3. a-f. Overall survival curves based on CA125 results (a), PET/CT findings (b), peritoneal (c), lymph nodal (d), liver (e), and visceral (f) metastases determined by PET/CT images

after therapy). In the latter organ, PET/CT gave a false positive result in one patient. Finally, bone lesions were discovered in 4 patients undergoing PET/CT for the recurrence of disease and were later confirmed by bone scan. The value of CA125 was

Table 5. Univariate and multivariate Cox regression analysis

	Univariate analysis			Multivariate analysis		
	HR	CI 95%	p	HR	CI 95%	p
Age	1.042	1.018–1.066	<0.001	1.040	1.014–1.067	<0.005
Histology	0.890	0.783–1.011	0.074	1.023	0.910–1.150	0.760
FIGO staging	1.200	0.944–1.525	0.137	-	-	-
Grade	1.174	0.836–1.647	0.355	-	-	-
CA125	2.780	1.517–5.097	<0.005	1.942	0.957–3.941	0.066
PET findings	3.361	1.571–7.191	<0.005	1.117	0.346–3.605	0.853
Peritoneum recurrence at PET	2.708	1.538–4.770	<0.005	2.408	1.051–5.517	<0.05
Local and distant metastasis at PET	1.640	0.934–2.879	0.085	0.471	0.086–2.567	0.384
Liver metastasis at PET	1.704	0.820–3.540	0.153	-	-	-
Lung metastasis at PET	2.381	0.942–6.021	0.067	1.947	0.503–7.539	0.335
Bone metastasis at PET	1.803	0.645–5.036	0.261	-	-	-
Visceral/non visceral metastasis at PET	1.369	1.053–1.780	0.019	1.513	0.666–3.437	0.323

HR: hazard ratio; CI: confidence interval; FIGO: international federation of gynecology and obstetrics; CA: cancer antigen; PET: positron emission tomography

consistently different among patients with visceral, non-visceral, and mixed disease (ANOVA, $p<0.005$). Similarly, a high value of CA125 was associated with diffuse peritoneal dissemination at PET/CT; however, this result was not statistically significant (value: 300.4±849.8 vs. 151.8±368.23 UI/mL; Student's t-test; $p=0.218$). For positive PET/CT scans, the SUVmax of the hottest lesion was recorded. No differences for the mean SUVmax were found among histological types (ANOVA test; $p=0.558$), stages (ANOVA test; $p=0.463$), and grading (ANOVA test; $p=0.780$). We found that a SUVmax cutoff of 4.0 accurately indicated the presence of disease in our cohort of patients (sensitivity: 96% and specificity: 74%; AUC: 0.843, $p<0.005$). In patients with confirmed peritoneal carcinomatosis, the median SUVmax was 10.17 (range: 3.53 to 21), while SUVmax values of 8.75 (3.54 to 16.9), 5.5 (3.5 to 18.0), and 11.3 (4.5 to 26.6) were found in patients with non-visceral (lymph node and bone), visceral (liver and lung), and mixed (visceral and no-visceral) metastases, respectively. No correlation between SUVmax and CA125 was found ($R^2=0.006$; p=NS).

PET/CT, CA125 and prognosis

The results obtained by Cox regression analysis are shown in Table 5. As illustrated by univariate analysis, older age, high CA125 level, positive PET results, and peritoneum recurrence determined by PET were correlated with an unfavorable prognosis. Conversely, by multivariate regression analysis, only high age and the presence of peritoneum recurrence at PET were identified as independent predictors of unfavorable prognosis. The survival analysis demonstrated that GS was significantly better in patients who had negative CA125 values at the time of PET/CT imaging and a negative PET/CT scan, and in patients with no evidence of peritoneum recurrence and distant metastases by PET (Figure 3 a-e). Moreover, a negative PET/CT was associated with a more favorable prognosis, also in the case of normal CA125 levels (survival rates after 48 months were 72.8 and 49.4% for negative and positive PET/CT results, respectively). Finally, patients with non-visceral metastases, such as bone and lymph nodes, observed by PET had more favorable prognoses compared to those with visceral metastases (GS at 60 months: 24% vs. 16%, respectively).

Discussion

In accordance with our findings, FDG PET/CT has a higher predictive value than the CA125 serum marker in the detection of disease recurrence. Indeed, in our population, 63 patients had serum CA125 levels of 35 UI/mL or less; however, at least 35% of them showed a true-positive PET/CT result. Bhosale et al. (8) previously demonstrated that FDG PET/CT is able to detect OC recurrence in patients with normal CA125 levels, showing higher sensitivity than CT. Additionally, we found that a CA125 cut-off of 32.5 UI/L, slightly lower than the limit of normal levels (35 UI/mL), was useful to predict a positive PET/CT scan; this result agrees with other studies in which PET/CT confirmed the presence of early disease relapse, even in patients with a low level of serum CA125 (4). In our analysis, more than 60% of scans were performed secondary to clinical and conventional imaging when recurrence was suspected, implying that physicians find this imaging modality helpful in guiding their therapeutic choices. FDG PET/CT modified management in approximately half of the studied patients, resulting in the initiation of previously unplanned treatment or changes in previously defined therapeutic approaches. This result is in line with the current data in the literature (9-12). The evaluation of disease recurrence in patients with OC is often performed by imaging modalities because of the extension of the disease. In fact, obtaining histopathologic confirmation is not very common, because the patients are mostly treated with chemotherapy. On the other hand, patients with a positive PET/CT and high CA125 levels had a recurrence of disease more frequently, and therefore

did not require any verification; however, it was necessary to treat them as soon as possible. PET/CT yielded false negative results in patients with low-grade tumors, such as borderline tumors with peritoneal microimplants and in clear cell OC. Moreover, small areas where the dissemination of a small number of tumors with nodules smaller than 5 mm occurs can cause false negative results (13). Small implants (<5 mm) and low disease volumes are inconsistently recognized, particularly in upper abdomen quadrants including the hepatic dome, epigastrium, and left upper abdomen. These areas commonly experience miliary spread of carcinomatosis, which is difficult to visualize with the reduced spatial resolution of PET scanners. Furthermore, false positive PET/CT results can be caused by inflammatory and infectious processes, particularly after treatment. In our cohort of patients, PET/CT produced false positive findings in 7 cases: in 4 cases due to chronic abdomen inflammation, in 1 case secondary to bronchitis, in 1 case due to abnormal liver uptake, and in the final case due to an adrenal functional adenoma. Despite these pitfalls, PET/CT has proved to be superior to CT and magnetic resonance imaging for the depiction of recurrent disease (14). In accordance with our results, we found that the inclusion of PET/CT in the management of patients with recurrent ovary cancer had an impact on the decision making in 42% of subjects. As reported in the literature, the change in management of patients with OC who have undergone FDG PET/CT ranges between 25% and 58% (10, 15-18).

OC can disseminate to the peritoneum. Knowledge of disease mapping in the abdomen can be useful to determine optimal surgical cytoreduction, which predicts patient outcome. Anatomical imaging can fail to determine the real extent of metastatic disease and intra-abdominal tumor deposits. In our study, PET/CT was highly diagnostic in defining the extension of metastatic disease, including metastasis in normal-sized pelvic retroperitoneal lymph nodes and in unsuspected distant sites, providing a low rate of false negative findings. As previously stated in the literature, PET/CT can show metastatic implants in the peritoneum as focal or diffuse areas of uptake, distributed on serosal and peritoneal surfaces; sensitivity ranging between 58 and 100% has been reported (15, 19). Similarly, a high value of CA125 was associated with diffuse peritoneal dissemination; however, this result was not statistically significant. No evidence of a relation between the anatomical sites of tumors and serum CA125 levels was found; also, no correlations were identified between histological type, grading of disease, and CA125 biomarker level.

Less data are currently available regarding the correlation between prognosis and the value of PET/CT in OC. Nakamura et al. (20) and Chung et al. (18) investigated the relationship between PET/CT findings and prognosis before any treatments. The authors found that preoperative CA125 levels, metabolic tumor volume, total lesion glycolysis, and SUVmax were statistically significant independent prognostic factors for progression-free survival in patients with OC. Also, Risum et al. (21) evaluated the link between prognosis and preoperative PET/CT findings in patients with advanced OC, demonstrating that the median overall survival (OS) of PET/CT stage III and stage IV were 30.5 and 29.9 months, respectively. Avril et al. (22) demonstrated that OC patients responding to chemotherapy showed a longer median OS than non-responders. Only three studies evaluated the prognostic role of PET (7) and PET/CT (23, 24) in patients with OC after primary treatment. The results by Kurosaki et al. (7) are similar to the present report, showing that the serum CA125 level significantly correlated with the prognosis. However, in contrast to the study by Kurosaki et al. (7), we also found that a positive PET/CT finding and the presence of peritoneal implantations at PET are significantly associated with a shorter GS. Moreover, we determined by multivariate analysis that the presence of peritoneal carcinomatosis as determined by PET is an independent prognostic variable of an unfavorable prognosis. Therefore, the evidence of peritoneum invasion should be carefully addressed during the PET/CT examination, as it provides strong independent prognostic data.

The most important limitation of the present study is the retrospective nature of the analysis. Nevertheless, the results obtained are in line with those presented by other studies. Whether PET/CT should be routinely used instead of using a combination of conventional imaging modalities needs to be evaluated.

In conclusion, FDG PET/CT has utility in patients when OC relapse is suspected, particularly when CA125 levels are elevated. However, PET/CT can be employed also in patients with clinical symptoms of suspected cancer relapse without increased levels of this tumor marker. Meanwhile, both an abnormal CA125 value and a positive PET/CT scan are related to a poor GS. Finally, the presence of peritoneum recurrence as determined by PET is independently associated with a shorter prognosis after a period ranging between 11 and 50 months. Additional prospective trials designed with a large number of cases and examining the diagnostic and prognostic meaning of FDG PET/CT in the early detection of OC recurrence independent of CA125 levels are recommended.

Ethics Committee Approval: *Ethics committee approval was not received due to the nature of the study.*

Informed Consent: *Written informed consent was obtained from patients who participated in this study.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - L.E., M.D.P., V.Z.; Design - L.E., M.D.P.; Supervision - V.Z., M.G., M.N.; Resource - M.O.N., G.B.N.; Materials - A.R.; Data Collection and/or Processing - L.E., M.D.P.; Analysis and/or Interpretation - L.E., M.D.P.; Literature Search - O.N., A.R., G.B.N.; Writing - L.E., M.D.P.; Critical Reviews - V.Z., M.N., M.G.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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The effect of the use of a new type of partogram on the cesarean section rates

Georgios Vlachos[1], Panagiotis Tsikouras[1], Bachar Manav[1], Grigorios Trypsianis[1], Vasileios Liberis[1], Sakellarios Karpathios[2], Georgios Galazios[1]

[1]Department of Obstetrics and Gynecology, Democritus University of Thrace, Alexandroupolis, Greece
[2]Department of Obstetrics and Gynecology, Emeritus Assistant Professor, 1st University Alexandra Hospital, Athens, Greece

Abstract

Objective: To assess the contribution of a new type of partogram, used in labor monitoring, in caesarean section rates.

Material and Methods: The study included term singleton uncomplicated pregnancies divided into two groups. Two types of partogram were used in labor monitoring. In the first group, the classical WHO partogram (A) was used. In the second group, a new type of partogram, in which cervical dilatation and the position of descending head (B) (one line) were estimated and reported, was used. The labor duration and caesarean section rates were calculated and compared in the two groups.

Results: A statistically significant decrease in labor duration (from the initiation of the active phase of labor to the delivery time) (dt1+dt2+dt3) ($p<0.001$, A: median: 318.4±10.4 min, B: 246.56±8.28 min) and in caesarean section rates was noted ($p<0.001$, A: 89 vs B: 49).

Conclusion: The new type of partogram seems to have potential benefits such as reducing the incidence of prolonged labor and decreasing the caesarean section rates. (J Turk Ger Gynecol Assoc 2015; 16: 145-8)

Keywords: New type of partogram, caesarean section rate, labor management

Received: 18 April, 2015 **Accepted:** 16 July, 2015 **Available Online Date:** 06 August, 2015

Introduction

Recently, the caesarean section (CS) rates have dramatically increased worldwide. However, there is no clear evidence of a simultaneous decrease in maternal or perinatal morbidity or mortality (1, 2). The process of labor is associated with both maternal and fetal potential risks, regardless of the mode of delivery (3, 4). There are various CS indications that aim to reduce the maternal/fetal risks (5-7). However, most of the caesarean deliveries are performed because of relative indications, according to which the maternal/fetal risks are thought to be relatively less in CS compared with vaginal delivery (8). In the developing countries, prolonged labor is one of the most frequent causes of maternal mortality and is generally related to cephalopelvic disproportion and cervical dystocia (9). An early detection of the abnormal progress of labor was shown to prevent prolonged labor; reduce the risk of postpartum hemorrhage; and eliminate the obstructed labor, uterine rupture, and perinatal fetal asphyxia cases and admissions to the intensive neonatal care unit (10). The partogram is a labor graphic record of the progress of the first stage of labor combined with cervical dilatation and descent of head and labor duration (11). The aim of this study was to investigate the value of the use of a new type of partogram and compare it with the classical partogram in reducing the CS rates.

Material and Methods

This retrospective study included the labor management of 478 term, singleton pregnancies, and the following deliveries were conducted at the University Hospital of Alexandroupolis, Greece. The study had the approval of the ethics committee, and all participants gave their informed consent to this study.

In this retrospective study, partograms of the cases with the following criteria were included in the study: cervical dilatation not more than 6 cm, singleton pregnancies, gestation of at least 37 completed weeks, cephalic presentation, no use of oxytocin in the first stage of labor, and absence of additional complications. We compared the efficacy of the two types of partograms during labor. A total of 478 maternity records were audited retrospectively: 340 (71.2%) spontaneous vaginal deliveries and 138 (28.8%) caesarean births. The exclusion criteria were hypertension, antepartum hemorrhage, and post term pregnancies. Cord blood pH measurement was not performed, and none of the women received epidural analgesia.

The study population was divided into two groups according to the type of partogram used during labor monitoring. The two types of partograms used were as follows:

1) Fisher partogram, with one –hour two lines: cervical dilatation and actions line evaluated every one hour.

Address for Correspondence: *Panagiotis Tsikouras, Department of Obstetrics and Gynecology, Democritus University of Thrace, Alexandroupolis Greece. Phone: 00306974728272 e.mail: ptsikour@med.duth.gr*

DOI:10.5152/jtgga.2015.15074

Table 1. Characteristics of women according to the partogram

	Fischer	New type of partogram	p
Number of women	89	49	
Age (years; mean±SD)	29.10±3.15	29.56±3.68	0.659
Parity, no (%)			0.678
Nulliparous	42 (80.0%)	38 (76.0%)	
Multiparous	10 (20.0%)	12 (24.0%)	
Gestation (weeks; mean±SD)	39.23±0.86	39.18±0.87	0.791
Birth weight (g; mean±SD)	3424.17±328.29	3403.40±328.63	0.817
APGAR at 1 min (mean±SD)	9	9	1.000
APGAR at 5 min (mean±SD)	10	10	1.000

2) New type of partogram, with one line depending on three parameters, i.e., cervical dilatation, actions, and fetal head descent line.
The first stage of labor was divided into the latent phase and the active phase. The latent phase was defined as the time from the first cervical ripening agent until cervical dilatation reached 3 cm, accompanied by the presence of two or more uterine contractions in 10 min, each lasting 20 s or more and is followed by the gradual shortening of the cervical length. The active phase of labor was defined as the time from the cervical dilation of ≥3 cm [until complete cervical dilatation (10 cm)] and characterized by the presence of painful regular contractions (every 5 min or less, lasting more than 20 s) and a cervical dilatation rate of at least 1 cm/h. Amniotomy was performed in cases of slow labor progress or an arrest of cervical dilatation over 1 h. The duration of the first stage of labor was defined as the time required to reach a full cervical dilatation. The progress of labor was correlated with the cervical dilatation and descent of the fetal head. The descent of the fetal head was measured by vaginal examination, but it did not take place until the cervix reached a dilatation of 7 cm. A deceleration phase seemed to be present at the end of the active phase of labor (full cervical dilatation). The second stage was defined as the time from the first active expulsion efforts to delivery. In each group, the following parameters were recorded: cervical dilatation (at least once every 1 h), fetal heart rate, blood pressure, maternal temperature (hourly), and postnatal fetal outcome. The mean values of these parameters were used to construct the partograms. The following parameters were studied and were noted in the partogram for both group A and group B as an alert line: characteristics of women and time intervals (in min) from the time of decision to the time of intervention.

Results

From January 2005 to December 2010, a total number of 478 pregnant women who met the inclusion criteria of our study attended the Obstetric Department of our Hospital. The maternity records were checked retrospectively: 340 women (71.2%) had spontaneous vaginal deliveries and 138 women (28.8%) underwent emergency CS. The partogram of 200 grand multipara women (mean 2 previous deliveries) were analyzed according to the Fisher partogram (total 69) and the new type of partogram (total 131) and were compared with the partogram of nulliparous women (total 278) who either had the Fisher partogram (total 112) or the new type of partogram (total 165) (Tables 1, 2). The full-term pregnancies were normal, and the vaginal deliveries were spontaneous and non-instrumental. In total, 171 nulliparous and 169 multiparous women had a normal vaginal delivery, whereas 107 nulliparous and 31 multiparous women underwent CS (Table 1). The deviation of maternal age (p=0.659), parity (p=0.678), and gestational week (p=0.791) between the two groups was not statistically significant (Table 1). The recorded values of fetal heart rate, blood pressure, and maternal temperature were within normal limits. No cases of neonatal mortality were recorded. The mean birth weight was similar in both groups (p=0.187) (Table 1). The condition of the neonates was assessed using the APGAR score because there were no facilities for cord blood sampling. APGAR scores at 1 and 5 min after labor recorded in all studied participants were also similar between the two groups (p=1.00) in the cesarean section group (Table 1). On the other hand, in the cesarean section group, the overall time from admission to the hospital until delivery was longer (by 19.3%) in the participants whose labor progress was evaluated with the partogram B (512.00±16.61 min vs. 429.17±15.34 min) than those using partogram A [p=0.001; 95% confidence interval (CI) of the difference, 33.97–131.69 min] (Table 2).

Discussion

According to our findings, the new type of partogram is a great tool in labor management. It contributes to the early detection of obstructed labor. In addition, compared with the classical partogram, it leads to earlier decision making in labor management and is shown to reduce the section rates. The worldwide increase in caesarean section rates is due to indications such as labor abnormalities, fetal distress maternal age, and parity, which are often over-diagnosed (12-14). The partogram may be a useful tool in increasing the quality of all observations on the fetus and mother in labor. It may lead to early problem detection and has many potential benefits on the active management of labor (15, 10). However, the use of a partogram is controversial, particularly in elective cesarean section cases, in which no advantages are observed because there is no labor (16). Active management, opposed to expectant management, has reduced the prolonged labor incidence and the caesarean section rates (10). The use of the partogram reduces the risk of prolonged labor, cesarean sections, and perinatal mortality (17-20). The documentation of the partogram includes the administration of oxytocin and procedures such as amniotomy (18). In the classical Fisher partogram, cervical dilatation and action line are the recorded parameters of the progress of labor. It consists of two straight diagonal parallel lines, where the action line is parallel and at the right of the alert line, but the fetal head descent is not included (21). The alert line drawn from

Table 2. Time intervals (in min; expressed as mean±standard error) and caesarean section rates in two groups

	Fischer	New type of partogram	p	95% CI of the difference
Start of active phase – Labor	344.50±12.80	380.50±15.19	0.074	−79.79–7.79
Time of entrance in the hospital – Labor	429.17±15.34	512.00±16.61	0.001	−131.69–33.97
Caesarean section rate	89/478 (18.69%)	49/478 (10.25%)	0.001	−8.3436–8.5124
CI: confidence interval				

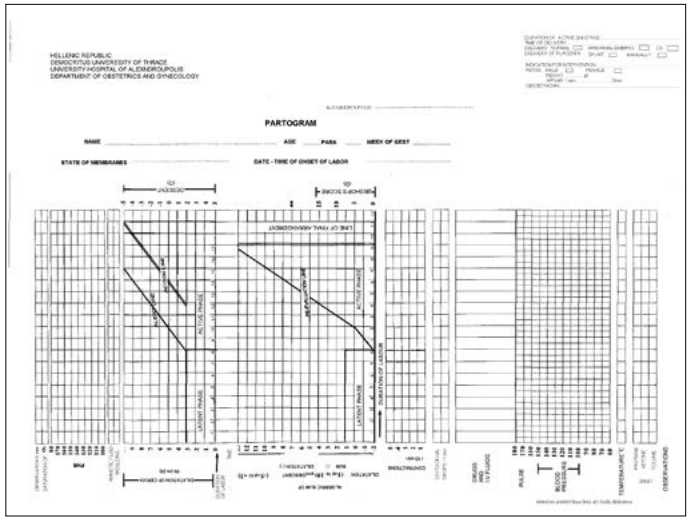

Figure 1. New type of partogram

3 cm to 10 cm represents the dilatation rate. The action line is drawn in the right of the alert line and shows if cervical dilatation is altered. It is known that cervical dilatation is a critical assessment and one of the main reasons of prolonged labor. In the new partogram under study, the alert line is crossed only once, and it is included as part of the single graphic line evaluation of labor progress (Figure 1). An early decision about the appropriate management to overcome the labor delay is possible with the use of the new type of partogram with only one graphic line (22). The wide variation in the published records of labor observation suggests that midwives and some obstetricians prioritized cervical dilatation over the other parameters (21). It is notable that the partogram and particularly the new partogram can only be used by health workers with adequate experience in midwifery and who are responsible and authorized to observe and conduct normal labor, perform vaginal examination, assess cervical dilatation and fetal head descent accurately, and immediately note cervical dilatation and head descent on a graph against time. The results of our study confirm that the fetal head descent is an important labor progress parameter when it comes to decision making concerning the delivery mode. The failure of descent of the presenting part during the first stage of labor in addition to the arrest of cervical dilatation was associated with high cesarean section rates. However, the slow head descent is caused by pelvic floor physiological changes and is not exclusively due to cephalopelvic disproportion, particularly in multiparas (23). The fetal condition intrapartum, to achieve satisfying fetal outcome, is closely monitored on the partogram by the regular observation of the fetal heart rate, liquor, and the molding of the fetal skull bones (24). The substandard intrapartum fetal monitoring is strongly associated with poor fetal outcome ($p<0.001$) (24). Although partograms have been described and used since the early 1970s, it is still not used worldwide (9). The reasons may be the lack of leaders of the professional partogram use and the existence of various partograms, which results in the new users following conflicting guidelines. We believe that further studies of the new type of partogram should be conducted to investigate the association of this functioning referral system with perinatal results and caesarean frequency rates. According to our opinion, the introduction of partograms in labor monitoring accompanied by a program of training in its use is of great importance.

Ethics Committee Approval: *Ethics committee approval was received for this study from the ethics committee of General Hospital of Xanthi and University Hospital of Alexandroupolis.*

Informed Consent: *Written informed consent was obtained from patients who participated in this study.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - S.K., G.G., P.T.; Design - G.V., P.T., G.G.; Supervision - G.G., P.T.; Resource - G.G., P.T.; Materials - G.V., P.T.; Data Collection and/or Processing - G.V., P.T.; Analysis and/or Interpretation - G.T., P.T.; Literature Search - G.V., P.T., B.M.; Writing - G.V., P.T., B.M.; Critical Reviews - V.L., G.G.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Evaluation of sleep in women with menopause: results of the Pittsburg Sleep Quality Index and polysomnography

Kağan Ağan[1], Recep Özmerdivenli[1], Yıldız Değirmenci[2], Mete Çağlar[3], Alper Başbuğ[3], Ege Güleç Balbay[4], Mehmet Ali Sungur[5]

[1]Department of Physiology, Düzce University Faculty of Medicine, Düzce, Turkey

[2]Department of Neurology, Düzce University Faculty of Medicine, Düzce, Turkey

[3]Department of Gynecology and Obstetrics, Düzce University Faculty of Medicine, Düzce, Turkey

[4]Department of Chest Disease, Düzce University Faculty of Medicine, Düzce, Turkey

[5]Department of Biostatistics and Medical Informatics, Düzce University Faculty of Medicine, Düzce, Turkey

Abstract

Objective: To investigate subjective sleep quality among women in the menopausal period and to confirm and diagnose the possible sleep disturbances with polysomnographic (PSG) evaluation objectively.

Material and Methods: Sixty-seven women with menopause were enrolled in the study. Sociodemographic characteristics and the features of menopause were recorded. We assessed subjective sleep quality with Pittsburg Sleep Quality Index (PSQI). To confirm sleep disturbances and further diagnose the underlying cause, PSG evaluation was performed to women with PSQI scores of >5 who gave their approval.

Results: Mean PSQI score of women with normal PSG evaluation was 12.00±3.16, while it was 11.00±2.32 in women with abnormal PSG evaluation (p=0.466); 59.7% (n=40) of women had poor sleep quality. Among these, 11 (64.7%) had abnormal results in the PSG evaluation and were diagnosed with obstructive sleep apnea syndrome (OSAS); 54.5% had mild OSAS, 27.3% had moderate, and 18.2% had severe OSAS.

Conclusion: PSQI and PSG evaluations would give a chance to demonstrate sleep problems and shed a light on treatment options according to the underlying causes of sleep disturbances in menopause. (J Turk Ger Gynecol Assoc 2015; 16: 149-52)

Keywords: Menopause, sleep disturbance, Pittsburg Sleep Quality Index, polysomnography

Received: 27 April, 2015 **Accepted:** 07 June, 2015 **Available Online Date:** 14 July, 2015

Introduction

Menopause is the perpetual cessation of menstruation resulting from the loss of ovarian hormonal activity. It is a retrospective diagnosis, which can be detected after 12 months from the last menstruation without any attributable cause. However, surgical menopause is determined as the cessation of menses because of hysterectomy with or without oophorectomy (1). The ovarian failure process is an ongoing period in midlife women, characterized with a change in intermenstrual period and bleeding pattern, accompanied by hormonal fluctuations defined as menopausal transmission or perimenopause that occurs at an average age of 47 years (2).

This period of menopausal transmission may lead to a variety of symptoms because of the changes in blood sex hormone levels, including vasomotor symptoms as hot flashes and night sweats, physical symptoms as headaches, palpitations, bone and joint pains, asthenia, tiredness, sexual concerns because of vaginal dryness, urinary incontinence, depressed mood, and sleep disturbances (3).

Regarding this wide range of symptoms that women may experience in the menopausal period, sleep disturbance is one of the most distressing symptoms affecting 46% of women between the ages of 40 and 54 years, and 48% of them at the age of 55–64 years, according to a national sleep foundation survey held in 2007 (4).

Although the previous studies revealed perceived sleep problems more frequently among women with menopause, objective measures of sleep patterns demonstrated that peri- and postmenopausal periods are not related to sleep disturbances (4).

In the light of the current literature knowledge, we aimed to investigate the subjective sleep quality among women in the menopausal period and to confirm and diagnose the possible sleep disturbances with polysomnographic (PSG) evaluation objectively.

Material and Methods

Patients who were diagnosed with menopause in the Gynecology and Obstetrics outpatient clinics of our university

Address for Correspondence: *Recep Özmerdivenli, Düzce Üniversitesi Tıp Fakültesi, Fizyoloji Anabilim Dalı, Düzce, Türkiye.*
Phone: +90 532 426 98 98 e.mail: rozmerdivenli@hotmail.com

DOI:10.5152/jtgga.2015.15087

and at our city's State Hospital were enrolled in the study between January 2014 and November 2014. Menopause, as a retrospective diagnosis, was determined as the perpetual cessation of menstruation with 12 months of amenorrhea because of the loss of ovarian hormonal activity without other underlying reasons (5). Before enrolment, the content of the study was explained to the patients and written approvals with an informed consent were gathered from them. The local ethical committee of the Düzce University School of Medicine approved the study.

Sociodemographic characteristics of the participants, including the characteristics of menopause, were recorded via face-to-face interview with an open questionnaire.

Pittsburgh Sleep Quality Index (PSQI) was used to assess the subjective sleep quality in all patients. This questionnaire is self-rated and evaluates sleep quality and disturbances over a 1-month period. It has 19 individual items with seven "component" scores: subjective dysfunction. The scores of each item of the index vary between 0 and 3. Total score of these seven components makes one score of 0–21. A total score >5 indicates insufficient sleep quality. PSQI of ≤5 indicates good sleepers, while PSQI of >5 corresponds with poor sleepers (6).

Patients with a PSQI of >5 and who accepted this noninvasive procedure were referred to the sleep laboratory of our university and underwent an overnight PSG evaluation (Alice 5 Sleep System, Philips, Respironics, Pennsylvania, United States) to confirm the existence of sleep disturbance objectively.

PSG consists of a simultaneous recording of multiple physiological parameters, including electroencephalogram (EEG), electrooculogram (EOG), electromyogram (EMG), electrocardiogram (ECG), oral and nasal air flow cannula, thorax and abdomen movements, body position, snoring, and pulse oxymeter. At least 6 hours overnight PSG records were obtained for each patient. The all-night PSG sleep records were manually scored in a computer program. Apnea was defined as the complete lack of or an airflow reduction of >90% through the mouth and nose. Hypopnea scoring criteria defined as an airflow reduction of at least ≥30% for 10 seconds associated with oxygen desaturation of ≥3% or arousal. Apnea–Hypopnea Index (AHI) is represented by the number of apnea and hypopnea events per hour of sleep. Patients with AHI of ≥5 were diagnosed with obstructive sleep apnea syndrome (OSAS). The severity of OSAS was considered as follows: normal (AHI of <5); mild sleep apnea (AHI of 5–15); moderate sleep apnea (AHI of 16–30); and severe sleep apnea (AHI of >30) (7).

Statistical analysis

Statistical analyses of data were performed with Predictive Analytics Software (PASW) v.18, which is a registered trademark (SPSS Inc., Chicago, United States). Descriptive statistics were presented as mean±standard deviation or median interquartile range (IQR) for continuous variables, and as frequency and percentage for categorical variables. The groups were compared with independent samples t-test or Mann–Whitney U-test. Chi-square or Fisher's exact test was used to assess categorical data based on test assumptions. P values of <0.05 were considered statistically significant.

Results

A total of 67 women with the diagnosis of menopause were enrolled in the study. Mean age was 52.12±7.24 years (range=33–72 years). Mean body mass index (BMI) of the participants were 29.43±4.81 kg/m^2 (range=17.63-41.91). Table 1 shows the sociodemographic features of the participants.

Median duration of menopause was 3 years (range=1.5–8 years). Among 67 women with menopause, 35.8% (n=24) were diagnosed with surgical menopause, while 64.2% (n=43) were diagnosed with natural menopause. In the overall participants, 17.9% (n=12) women were receiving hormone replacement therapy (HRT). When we assessed the comorbidity in the study group, we found that 11.4% (n=11) of the women had diabetes mellitus (DM), 35.8% (n=24) had hypertension (HT), 6% (n=4) had hypothyroidism, 7.5% (n=5) had hyperthyroidism, and 47.8% (n=32) had headaches.

In 67 women with menopause, subjective sleep quality was measured with PSQI, and according to the results of PSQI, 59.7% (n=40) of the women were found to have poor sleep quality. Poor sleep quality rates were found to be 60.5% (n=26) in women with natural menopause, and 58.3% (n=14) in women with surgical menopause. No statistically significant difference was found between the groups (p=0.865).

When we further evaluated the sociodemographic and clinical features of the groups with normal and high PSQI scores, the only statistically significant difference found was in the cigarette smoking group, in which the mean PSQI score was higher among the cigarette smokers, suggesting a poorer sleep quality than nonsmokers (p=0.02). Table 2 shows the evaluation of PSQI scores with the sociodemographic characteristics of the participants.

Table 1. Sociodemographic features of the participants

		n (%)
Occupation	Housewife	54 (80.6)
	Retired	5 (7.5)
	Worker	8 (11.9)
Marital status	Married	59 (88.1)
	Single	2 (3.0)
	Widow	6 (9.0)
Education	Literate	13 (19.7)
	Primary school	39 (59.1)
	Secondary school	2 (3.0)
	High school	9 (13.6)
	University	3 (4.5)
Daily habits	Cigarette smoking	14 (21.2)
	Alcohol use	3 (4.5)
	Tea consumption	64 (97.0)
	Coffee consumption	26 (39.4)
	Chronic drug use	36 (55.4)

n=number, %=percentage

Table 2. The evaluation of PSQI scores with the sociodemographic characteristics of the participants

	Women with normal PSQI scores (n=27)	Women with abnormal PSQI scores (n=40)	p
Mean Age (year)	54.19±7.04	50.73±7.11	0.054
Mean BMI (kg/m^2)	30.33±4.99	28.79±4.63	0.205
Mean duration of menopause (year)	3 (1.5–12)	3 (1.5–8)	0.738
Surgical menopause	10 (37.0)	14 (35.0)	0.865
HRT	5 (18.5)	7 (17.5)	0.915
DM	3 (11.1)	8 (20.0)	0.504
HT	11 (40.7)	13 (32.5)	0.490
Hypothyroidism	1 (3.7)	3 (7.5)	0.643
Hyperthyroidism	2 (7.4)	3 (7.5)	0.999
Headache	11 (40.7)	21 (52.5)	0.345
Cigarette smoking	2 (7.4)	12 (30.8)	0.022
Alcohol use	0 (0.0)	3 (7.5)	0.267
Tea consumption	27 (100.0)	37 (94.9)	0.509
Coffee consumption	12 (44.4)	14 (35.9)	0.485
Drug use	15 (55.6)	21 (55.3)	0.981

*Continuous variables are defined as mean±standard deviation or median interquartile range (IQR), while categorical variables are defined as n(%).
PSQI: Pittsburg Sleep Quality Index; BMI: body mass index; HRT: hormone replacement treatment; DM: diabetes mellitus; HT: hypertension; IQR: interquartile range

While 23 patients did not accept PSG evaluation, further PSG analysis was performed in 17 of the women with poor sleep quality. Among these, 6 (35.3%) had normal and 11 (64.7%) had abnormal results in the PSG evaluation. Mean PSQI score of women with normal PSG evaluation was 12.00±3.16, while the mean score was 11.00±2.32 in women with abnormal PSG evaluation, thereby revealing no statistically significant difference (p=0.466).
Eleven (64.7%) women with abnormal results in PSG evaluation were diagnosed with OSAS. They were categorized as mild (54.5%; n=6), moderate (27.3%; n=3), and severe (18.2%; n=2) OSAS based on the AHI levels.

Discussion

Menopause is a physiological period in a woman's life, which occurs at the age of approximately 56.6±6 years (8). Similarly, the mean age of menopausal women in our study was found to be 52.12±7.24 years (range=33–72 years).
Because women in menopause experience a wide range of symptoms as hot flashes, night sweats, mood changes, and sleep problems, sleep difficulties in a midlife women can easily be attributed to menopausal transition and/or menopause, in particular (9).
One of the most common sleep problems seen in menopause is insomnia with a prevalence of 28%–63%, which includes difficulty in falling asleep and/or maintaining sleep, leading to daytime sleepiness and fatigue (10). The most frequent underlying causes of insomnia in menopause include anxiety, hot flashes, sleep-disordered breathing (sleep apnea), and restless leg syndrome (rhythmic limb movements) (3).
A US community-based survey demonstrated that 38% of the women between the ages of 40 and 55 years were suffering from sleep difficulty, and these rates were higher in the late perimenopausal and postmenopausal groups as 45.4%, and 47.6%, respectively (11). Suggesting the frequency of sleep problems in women with menopause, 59.7% of our study group was dealing with sleep problems, which were detected as poor sleepers because of the results of PSQI. We attributed the higher rate to the design of our study, which was held in the outpatient clinics of Gynecology and Obstetrics.
To confirm subjective sleep problems that we detected by PSQI and diagnose the possible underlying sleep-disordered breathing problems, we applied PSG evaluation to the patients with poor sleep quality who approved to undergo PSG evaluation; 64.7% of the patients had abnormal results and were diagnosed with OSAS. However, the lack of a control group can be considered as the limitation of our study.
Suggesting our results, previous studies have shown that the frequency and severity of sleep apnea increases during menopause because of weight gain and decrease in estrogen and progesterone levels (12, 13). Moreover, a previous report revealed that approximately 75% of the patients with OSA are suffering from obesity. Thus, obesity (BMI of >30 kg/m^2) is a risk factor for OSA. Because obese people have large fat deposits in the neck, they are more likely to experience upper airway collapse in the supine position during sleep (14). However, the mean BMI of our participants was found to be 29.43±4.81 kg/m^2 (range=17.63–41.91), but no statistically significant difference was found in the mean BMI of women with normal and abnormal PSQI scores.
Our PSG evaluation results revealed that the rate of moderate and severe OSAS was 45.5%, which was higher than that in the study that determined the prevalence of moderate to severe insomnia as 20% (14). However, the study population, mean age, and menopause duration may be responsible for varying results.
A previous cohort study held in US revealed that menopause is the most important factor for reported sleep problems, in which the risk of sleep problems increase up to 1.2, 1.3, and 1.6 times in natural menopause, late perimenopause, and surgical menopause, respectively (11). Similarly, reported sleep problems based on our poor scores in the PSQI were higher in women with natural and surgical menopause being 60.5%, and 58.3%, respectively.
Because sleep problems are commonly reported complaints in women of peri- and postmenopausal period with varying underlying causes of mood changes to climacteric vasomotor symptoms, sleep-disordered breathing, and accompanying illnesses (15, 16), it is important to detect and treat sleep problems to increase the quality of life of women in menopause because there seems to be a higher frequency of sleep breathing problems in women with menopause. In this aspect, using

PSQI and PSG evaluations would give a chance to demonstrate sleep problems and lighten the treatment options according to the underlying causes of sleep disturbances in menopause.

Ethics Committee Approval: *Ethics committee approval was received for this study from the Local ethics committee of Düzce University Faculty of Medicine (2013/453).*

Informed Consent: *Written informed consent was obtained from patients who participated in this study.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - R.Ö., Y.D., M.Ç.; Design - R.Ö., M.Ç., E.G.B.; Supervision - R.Ö, M.Ç, E.G.B., A.B.; Resource - M.Ç., A.B., K.A.; Materials - M.Ç., A.B., K.A., M.A.S.; Data Collection and/or Processing - M.Ç., A.B., E.G.B., K.A.; Analysis and/or Interpretation - M.A.S.; Literature Search - K.A.; Writing - R.Ö., Y.D., M.Ç,. E.G.B., M.A.S.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Is adjuvant radiotherapy necessary for FIGO stage 1a grade 2 endometrial endometrioid adenocarcinoma?

Abdurrahman Hamdi İnan[1], Gülçin Şahin Ersoy[2], Yusuf Yıldırım[3], Tutku Gürbüz[1], Ayşe Gül Kebapçılar[4], Merih Hanhan[5]

[1]Clinic of Obstetrics and Gynecology, Ardahan State Hospital, Ardahan, Turkey

[2]Department of Obstetrics and Gynecology, Marmara University Pendik Training and Research Hospital, İstanbul, Turkey

[3]Department of Obstetrics and Gynecology, Divison of Gynecologic Oncology, Erzincan University Faculty of Medicine, Erzincan, Turkey

[4]Department of Obstetrics and Gynecology, Selçuk University Faculty of Medicine, Konya, Turkey

[5]Clinic of Obstetrics and Gynecology, Divison of Gynecologic Oncology, İzmir Aegean Obstetrics and Gynecology Education and Research Hospital, İzmir, Turkey

Abstract

Objective: The impact of adjuvant radiotherapy on the rates of survival and local recurrence was analyzed in patients diagnosed with International Federation of Gynecology and Obstetrics (FIGO) stage 1a grade 2 endometrial endometrioid adenocarcinoma.

Material and Methods: Medical records of 82 patients diagnosed and treated for FIGO stage 1a grade 2 endometrial endometrioid adenocarcinoma were reviewed retrospectively. A group of 59 patients who received postoperative radiotherapy was compared with a control group of 23 subjects treated without adjuvant radiotherapy; the duration of survival as well as the local recurrence and metastasis rates were evaluated in both groups.

Results: The analysis of patient data has revealed the rate of local recurrence as 4.3% vs. 1.7% (p=0.485), the rate of distant metastasis as 4.3% vs. 6.9% (p=1.000), and the mean survival time as 83.6±38.7 vs. 81.5±37.5 months (p=0.828) in the adjuvant radiotherapy and control groups, respectively.

Conclusion: In the presented study, adjuvant radiotherapy failed to improve the overall survival of the patients in the low-risk group (stage 1a grade 2). With the addition of the significant risk of radiation toxicity, it is highly probable that these patients will not benefit from postoperative radiotherapy. Close observation should be performed following the primary surgery in this patient group. Nevertheless, it should also be considered that adjuvant radiotherapy is a very effective treatment modality for the recovery of patients with vaginal relapse. (J Turk Ger Gynecol Assoc 2015; 16: 153-7)

Keywords: Endometrial cancer, adjuvant radiotherapy, mean survival time

Received: 23 September, 2014 **Accepted:** 14 May, 2015 **Available Online Date:** 14 July, 2015

Introduction

Endometrial carcinoma is the most frequently observed gynecologic malignancy in developed countries. The symptoms generally arise early in the course of the disease; therefore, despite the high incidence and the lack of effective screening tests, more than 80% of the cases are diagnosed at an early stage when full recovery is generally possible with surgical intervention only (1-4). At the time of diagnosis, approximately 68% of patients present with localized disease, 20% with metastasis to the regional lymph nodes, and 8% with distant metastasis. The overall 5-year relative rates in these patients are 96%, 67%, and 16%, respectively (5).

The major prognostic factors of the endometrial carcinoma are as follows: metastasis to lymph nodes, surgical stage, grade, myometrial invasion depth, and histological types (6). These risk factors facilitate the classification of the patients according to the recurrence rates and most suitable adjuvant therapy alternatives. The randomized studies have revealed that adjuvant radiotherapy has decreased the local recurrence rates in endometrial cancer without any significant contribution to the survival rates of patients with this disease (7). There have been numerous studies conducted on adjuvant radiotherapy for early-stage endometrial cancer confined to the uterus; however, the optimal treatment approach is still controversial (7-9). In this study, the impact of the adjuvant radiotherapy on the survival rate and local recurrence was analyzed in patients diagnosed with stage 1a grade 2 endometrial endometrioid adenocarcinoma.

Material and Methods

Medical records of patients diagnosed with endometrial endometrioid adenocarcinoma and treated in the gynecologic oncology department between August 2002 and January 2014 were reviewed retrospectively. The staging of patients

Address for Correspondence: *Gülçin Şahin Ersoy, Marmara Universitesi Pendik Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, İstanbul, Türkiye.*
Phone: +90 506 680 94 94 e.mail: gulcinsahinmd@gmail.com

DOI:10.5152/jtgga.2015.15163

operated before 2009 had been performed according to the 1988 International Federation of Gynecology and Obstetrics (FIGO) criteria (10); the surgical details of these patients at the time of the operation were reconsidered according to the 2009 FIGO criteria and the staging of these patients has been updated. Patients with a type of endometrial cancer other than endometrial endometrioid adenocarcinoma, with a surgical stage other than stage 1a, with a histological grade of 1 and 3, patients with missing data, and patients lost in the follow-up period have been excluded from the study. A total of 82 patients with a diagnosis of FIGO stage 1a and a postoperative histological grade of 2 have been included in the study.

Radiotherapy started after wound healing (after 4–8 weeks from operation). Of the 59 patients, 19 received postoperative external pelvic radiotherapy via the three-field or four-field box technique or three-dimensional conformal radiotherapy (3D-CRT) technique alone at a total dose of 4500–5000 cGy using Primus Linac (Siemens medical systems, Concord, California, United States) or Theratron 780E (MDS Nordion, Ontario, Canada) or Therasim 750 simulator (A.E.C.L., Ontario, Canada) or Axsim (Mecaserto, Vignes, France) in 20–25 daily fractions to the pelvis. 13 cases received intracavitary radiotherapy alone [3x400 cGy at 0.5 cm over 3–7 days at high dose rate or a total dose of 1500 cGy at low dose rate (50 cGy per hour)]Twenty-seven patients received intracavitary radiotherapy after external beam radiotherapy. According to the application of postoperative radiotherapy, the patients have been divided in two groups. In both groups, the duration of survival as well as recurrence and metastasis rates were evaluated. Age, comorbidities, parity, timings of menarche and menopause, surgical stage, histological grade, tumor size, survival, cytological analysis of peritoneal lavage, application of adjuvant radiotherapy, localization, and handling of recurrence if present were recorded as the main outcome measures. The study has been conducted in accordance with the Declaration of Helsinki and approved by the local ethics committee.

The Statistical Package for the Social Sciences (SPSS) v20.0 software (SPSS Inc., Chicago, Illinois, Unites States) has been used for the analysis of data. All data have been given in percentages, median, or mean±standard deviation (SD). Mann–Whitney U test and independent sample t test have been applied for the comparison of the two groups. Fischer's exact test has been utilized if conditions for chi-square test were not met. Kaplan–Meier life tables were used to calculate survival; log rank test was used for comparison of survival curves. Overall survival is defined as the time from random assignment to death as a result of any cause. In addition, the disease-free survival is determined as the length of time after treatment during which no recurrence or metastasis is found (6). The results were reported with a confidence interval of 95%, and p value <0.05 was considered as statistically significant.

Results

The group of patients without radiotherapy consisted of 23 cases with an average age of 56.6±9.5 years (between 39 and 71 years), whereas the group of patients with radiotherapy included 59 subjects with an average age of 57.7±7.7 years (between 39 and 75 years). The main reproductive data of all patients is summarized in Table 1.

Table 1. The distribution of the main reproductive and characteristic data of subjects in each group

	Patients without radiotherapy (n=23) mean±standard deviation	Patients with radiotherapy (n=59) mean±standard deviation	p
Age	56.6±9.5	57.7±7.7	0.589
Age of menarche	12.8±1.2	13.2±1.6	0.214
Age of menopause	49.3±5.2	48.4±5.4	0.502
Parity*	2	3	0.297
<60 years (n)	15	39	0.940
>60 years (n)	8	20	
*Data are expressed as median			

Table 2. The distribution of comorbidities in each study group

Comorbidities	Patients without radiotherapy (n=23), (n, %)	Patients with radiotherapy (n=59), (n, %)
Diabetes mellitus	7 (30.4)	10 (16.9)
Hypertension	6 (26.1)	22 (37.3)
Breast cancer	1 (4.3)	3 (5.2)
Infertility	0 (0.0)	2 (3.4)
Thyroid disorder	0 (0.0)	1 (1.7)
Cirrhosis	1 (4.3)	0 (0.0)
Varice	1 (4.3)	0 (0.0)
Heart disease	3 (13)	4 (6.9)
Familial mediterranean fever	1 (4.3)	0 (0.0)

The analysis of comorbidities in study groups has revealed that the most frequent illnesses in the groups of subjects with and without radiotherapy were hypertension and diabetes mellitus, respectively (Table 2).

The postoperative evaluation of the surgical specimens has revealed that the mean size of the tumor was greater in the group of patients with adjuvant radiotherapy (31.6±16.2 mm vs. 27.5±12.9 mm; p=0.436). However, neither this finding nor the comparison of the lymph node dissection rates between the two groups has yielded a statistically significant difference (Table 3).

The rates of recurrence and metastasis have shown no significant difference between the two groups (Table 4); however, remarkably, none of the patients with distant metastasis have demonstrated local recurrence. The comparison of both groups for survival and mortality rates has revealed similar results (Table 4).

Disease-free survival rate was similar in the postoperative radiotherapy group (91.5%) when compared to no treatment group

Table 3. The distribution of lymph node dissection rates, tumor sizes, LVSI, and type of adjuvant radiotherapy

	Patients without radiotherapy (n=23), (n, %)	Patients with radiotherapy (n=59), (n, %)	p
Paraaortic LND	12 (52.2)	26 (44.1)	0.508
Pelvic LND	17 (73.9)	47 (79.7)	0.572
Tumor size[a]	27.5±12.9	31.6±16.2	0.436
<20 mm	7 (30)	11 (21)	
>20 mm	16 (70)	48 (79)	
LVSI			
Positive	4 (18)	17 (29)	0.565
Negative	16 (69)	35 (59)	
Unknown	3 (13)	7 (12)	
Radiotherapy			
ERT	19		
ERT+ICRT	27		
ICRT	13		

[a]Mean±Standard deviation, millimeter
ERT: external pelvic radiotherapy; ICRT: intracavitary radiotherapy; LVSI: lymphovascular space invasion; LND: lymph node dissection

Table 4. The rates of reccurrence, metastasis, and mortality rates among the groups and the comparison of mean duration of survival between the study groups

	Patients without radiotherapy (n=23)	Patients with radiotherapy (n=59)	p
Recurrence[a]	1 (4.3%)	1 (1.7%)	0.485
Metastasis[a]	1 (4.3%)	4 (6.9%)	1.000
Mortality rate[a]	0 (0%)	2 (3.4%)	1.000
Survival (months)[b]	83.6±38.7	81.5±37.5	0.828

[a]n (%)
[b]Mean±Standard deviation

(91.3%) (p=0.945), There was also no statistically significant difference for the 5-year overall survival rates between the groups (96.6% and 100%, respectively, p=0.382). The disease-free survival and 5-year overall survival Kaplan–Meier curves are shown in Figure 1, 2.

Discussion

Currently, the staging of endometrial cancer is performed according to the FIGO guidelines updated in May 2009. The standard staging procedure consists of the evaluation of peritoneal lavage, total extrafascial hysterectomy, bilateral salpingo-oophorectomy, and pelvic and para-aortic lymph node dissection specimens (11). The role of postoperative radiotherapy in low-risk early-stage endometrial cancer has been investigated in many studies, and although a firm consensus has not been reached, authors predominantly have stated that adjuvant radiotherapy lowers the local recurrence rates but does not change the survival rates (Table 5) (7, 8). The results of the Post Operative Radiation Therapy in Endometrial Carcinoma (PORTEC) study were published

Table 5. Randomized articles about adjuvant RT in women with low-risk stage 1 endometrial cancer and trial characteristics

	Patients (n)	AdjRT	Follow-up (years)	Recurrence (%)	Overall Survival (%)
Keys et al. (7)	132 128	none ERT	5	8 4	89 89
Creutzberg et al. (8)	106 92	none ERT	10	9 10	81 82
Aalders et al. (9)	126 131	ICRT ICRT+ERT	5	6 9	98 93

AdjRT: adjuvant radiotherapy; RT: radiotherapy; ERT: external pelvic radiotherapy; ICRT: intracavitary radiotherapy

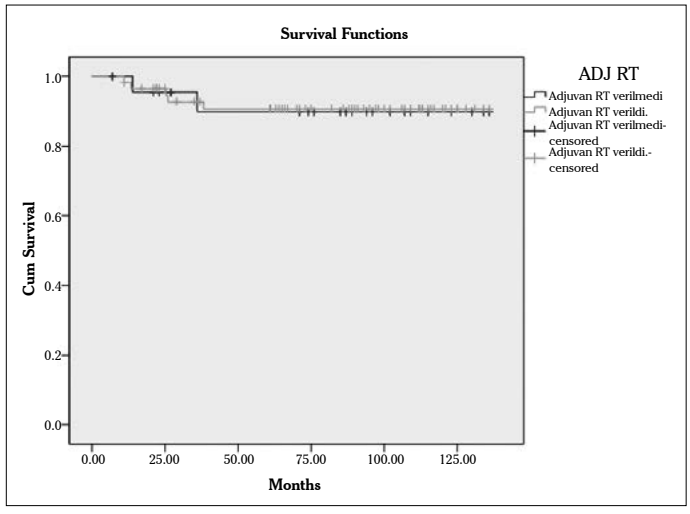

Figure 1. Disease-free survival

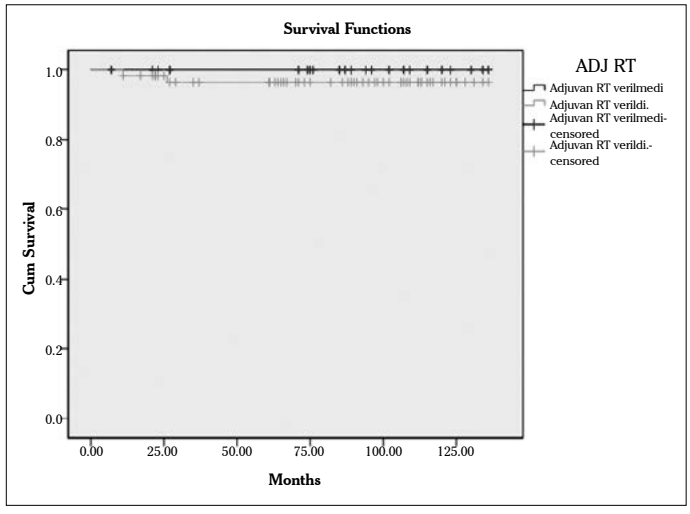

Figure 2. Overall survival at 5 years

in the year 2000, indicating the efficiency of radiotherapy in local recurrence control (8). In the PORTEC study Creutzberg et al. (8) reported that the comparison of the radiotherapy group with the control group for local and regional relapse has demonstrated local recurrence rates of 4% and 15%, respectively ($p<0.0001$); however, the survival rates were found to be similar in both groups. In conclusion, the research has emphasized that only patients at a high risk for recurrence should receive adjuvant pelvic radiotherapy postoperatively. Another remarkable finding in the PORTEC study Creutzberg et al. (8) reported the high efficiency of salvage radiotherapy for local recurrence control in patients without previous exposure to radiotherapy. In a similar study by Straughn et al. (12), patients with a surgically staged endometrial cancer restricted to the uterine corpus were evaluated; the results of the study have revealed that patients had a low risk of recurrence, and most of the recurrent cases were successfully treated with radiotherapy.

In a meta-analysis of seven studies conducted by Kong et al. (13), adjuvant radiotherapy was found to decrease local recurrence rates in stage 1 endometrial cancer, but it has a deleterious effect on overall survival because of its toxicity. According to the results of a similar study conducted by Kocak et al. (14) on the long-term benefits of postoperative adjuvant radiotherapy at stage 1b grade 2 endometrial cancer, the 3-year disease-free survival rates between the adjuvant radiotherapy group and no treatment group were 96.6% and 80.5%, respectively ($p<0.01$). Other trials showed that brachytherapy did not improve overall survival or recurrence in comparison with observation alone and was associated with significantly more toxicities, including vaginal, urogenital, and gastrointestinal adverse effects (15, 16). Based on these results, observation following surgery was recommended for the majority of patients with low-risk endometrial cancer.

In our study, we have detected no survival benefit for patients after radiotherapy, and the recurrence rates were found to be lower than other results reported in similar previous studies (13). In these studies, patients diagnosed with stage 1a grade 3 or stage 1b disease were also included, which could be interpreted as a possible reason for an increase in local recurrence rates. An additional factor may be that, compared with our study, a relatively lower proportion of patients underwent lymph node dissection in these trials. The comparison of both groups for recurrence rates has revealed no significant difference ($p=0.485$), indicating that the adjuvant radiotherapy had no influence on local recurrence in early-stage endometrial endometrioid adenocarcinoma patients.

The dosage and type of postoperative radiotherapy (e.g., pelvic external beam radiotherapy and vaginal intracavity brachytherapy) were not recorded in the medical charts of patients; thus, these data could not be retrieved. This fact has been recognized as a potential limitation for the comparison of our findings regarding the influence of radiotherapy on survival and local recurrence rates.

The aim of the treatment applied in low-risk early-stage endometrial cancer is to decrease treatment-related overall morbidity without compromising the survival rates (17). Epidemiologic studies have reported a 25% increase in the relative risk of secondary malignancies after radiation for endometrial cancer; young individuals are particularly under high risk (18). Therefore, radiotherapy should certainly be applied with caution, particularly in younger women with a long life expectancy. In conclusion, this study, the application of postoperative radiotherapy has been found to have no significant influence on the survival rates in low-risk patients with a diagnosis of FIGO stage 1a grade 2 endometrial endometrioid adenocarcinoma. The local recurrence rates were similar in both groups and remarkably lower than the results in previous studies.

Considering the findings of our study and other relevant trials reported previously, we believe that the use of adjuvant radiotherapy is not required in patients of the low-risk group (stage 1a, grade 2) because it fails to improve the survival rates and induces radiation toxicity in susceptible individuals. In this patient group, a close observation should be performed following the primary surgery, and radiotherapy should be considered as a very efficient recovery treatment modality in patients with vaginal relapse.

Ethics Committee Approval: *Ethics committee approval was received for this study from the Local ethics committee of Aegean Obstetrics and Gynecology Education and Research Hospital.*

Informed Consent: *N/A.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - H.İ., M.H., Y.Y.; Design - H.İ., M.H., Y.Y.; Supervision - Y.Y., M.H.; Resource - H.İ., Y.Y., M.H.; Materials - H.İ., G.Ş.E., M.H., Y.Y., T.G.; Data Collection and/or Processing H.İ., G.Ş.E., T.G.; Analysis and/or Interpretation - H.İ., G.Ş.E., A.G.K.; Literature Search - H.İ., G.Ş.E., T.G., A.G.K.; Writing - H.İ., G.Ş.E., Y.Y.; Critical Reviews - H.İ., G.Ş.E., Y.Y., A.G.K.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Blood loss in elective cesarean section: is there a difference related to the type of anesthesia? A randomized prospective study

Hüseyin Aksoy[1], Ülkü Aksoy[2], Burak Yücel[3], Sezin Saygı Özyurt[4], Gökhan Açmaz[4], Mustafa Alparslan Babayiğit[5], Günhan Gökahmetoğlu[6], Turgut Aydın[3]

[1]Department of Obstetrics and Gynecology, Kayseri Military Hospital, Kayseri, Turkey

[2]Department of Obstetrics and Gynecology, Kayseri Memorial Hospital, Kayseri, Turkey

[3]Department of Obstetrics and Gynecology, Kayseri Acıbadem Hospital, Kayseri, Turkey

[4]Clinic of Obstetrics and Gynecology, Kayseri Traininig and Research Hospital, Kayseri, Turkey

[5]Department of Public Health and Epidemiology, Gülhane Military Medical Academy, Ankara, Turkey

[6]Clinic of Anesthesiology, Kayseri Traininig and Research Hospital, Kayseri, Turkey

Abstract

Objective: We aimed to compare the effect of general and spinal anesthesia on maternal blood loss in elective cesarean section (CS).

Material and Methods: This was a prospective randomized study and included 418 healthy pregnant women with a term uncomplicated singleton pregnancy between 37 and 41 weeks of gestation. The study participants were randomly divided into two groups: the general anesthesia group and spinal anesthesia group. CSs were all performed using the same surgical technique, and within the groups, the same anesthetic procedures were used (either general or spinal). The primary outcome for this study was operative blood loss. Hemoglobin and hematocrit concentrations were compared between the two groups.

Results: The preoperative hemoglobin and hematocrit levels were similar in the both groups ($p=0.08$ and $p=0.239$, respectively). Significantly lower operative blood loss was achieved using spinal anesthesia versus general anesthesia during elective CS. The differences between preoperative and postoperative blood values for both the study groups were statistically significant ($p<0.001$).

Conclusion: This study demonstrates that spinal anesthesia is associated with a lower risk of operative blood loss than general anesthesia in low risk patients undergoing elective CS. (J Turk Ger Gynecol Assoc 2015; 16: 158-63)

Keywords: Operative blood loss, cesarean section, anesthesia

Received: 27 February, 2015 **Accepted:** 29 April, 2015 **Available Online Date:** 14 July, 2015

Introduction

Twenty million cesarean sections (CS) are performed worldwide each year (1, 2). The CS rates have steadily increased worldwide over the past decades (3-6) Moreover, Turkey has experienced a rapid increase in the rate of CSs. According to data from the Turkish Ministry of Health and National Institute of Statistics, the CS rate per live births increased from 21.2% in 2003 to 48% in 2011. Although the safety of CSs has improved, it is still associated with greater rates of maternal morbidity and mortality than vaginal delivery (7, 8). CS delivery is associated with severe maternal morbidity, including obstetric hemorrhage, hysterectomy, anemia, blood transfusion, and infection (9-11). Among these operative morbidities associated with CS, obstetric hemorrhage is the leading cause of maternal mortality worldwide. Because of both the potential maternal risks and financial concerns, the increase in the cesarean rate is a serious public health problem (12, 13).

Anesthesia in pregnant women has always been a concern in obstetric surgery. Anesthesia in CS is of particular concern because it affects millions of women worldwide. Despite substantial improvements in anesthetic and surgical techniques, operative blood loss during CS is still an important medical issue (14).

Therefore, this study aims to compare the effects of general and spinal anesthesia on maternal blood loss among women scheduled for elective CS.

Material and Methods

This study is a prospective randomized study. It was performed in a tertiary referral hospital between September 2013 and February 2014. The study protocol was approved by

Address for Correspondence: *Burak Yücel, Kayseri Acıbadem Hastanesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Kayseri, Türkiye.*
Phone: +90 532 600 95 54 e.mail: drburakyucel@gmail.com

DOI:10.5152/jtgga.2015.15034

the local ethics committee of Erciyes University, and informed consent was obtained from each participant. The study population comprised healthy pregnant women who were aged 18–42 years and were scheduled for elective CS. All of the participants had a term uncomplicated singleton pregnancy between 37 and 41 weeks of gestation. In total, 556 healthy [the physical status classification system (ASA) grade I] term (>37 weeks) women scheduled for elective CS delivery under either spinal or general anesthesia were recruited to the study. The preoperative evaluation was consistent with the clinic protocol and included anesthesia counseling and sonographic assessment of the gestational age. The complete blood count and coagulation tests were preoperatively performed. After a preoperative anesthetic evaluation, the patients were randomly divided into two groups: the general anesthesia (GA) and spinal anesthesia (SA) groups. The blood samples for preoperative hemoglobin (Hb) and hematocrit (Htc) concentrations were obtained 1 h before surgery.

The inclusion criteria for this study were as follows: at least 18 years of age, accepting general or spinal anesthesia for CS, no known previous allergic reaction or sensitivity to any of the anesthetic agents, no medical or surgical conditions requiring special attention, no special request for anesthesia or suspected pathology requiring special anesthesia, and no history of obstetric pathology (such as preeclampsia, hypertensive disorders, polyhydramnios, gestational diabetes mellitus, or abnormal placentation). Our exclusion criteria were as follows: participant refusal, abruptio placentae, placenta previa, Rhesus immunization, fetal compromise or anomaly, maternal coagulation abnormality, thrombocytopenia, abnormal preoperative coagulation test results, sepsis, cord prolapse, spinal deformity, fetal distress syndromes, multiple pregnancy, <37 weeks of gestation, known uterine anomaly or fibroid, contraindication to general or regional anesthesia (RA), clinical signs of hypovolemia, antepartum/intrapartum blood transfusion, failed induction of labor, ASA status ≥ II, and any systemic diseases or medication that would affect the coagulation system (such as a current or past history of anticoagulant therapy) and patients who failed SA and required conversion to GA. Moreover, patients who had major operative or anesthesia-related complications were excluded from the analysis. The participants were scheduled for CS, and none of the participants received premedication before the operation.

The primary outcome of this study was operative blood loss that was defined as the difference between the preoperative and postoperative Hb and Htc concentrations. Operative blood loss was calculated as follows: Operative blood loss=preoperative Hb−postoperative Hb and preoperative Htc−postoperative Htc. The same surgeons who were going to perform the operations, informed the participants regarding the procedure. After the participants provided informed written consent, they completed an enrollment questionnaire assessing sociodemographic characteristics and medical information. The medical variables included indication for CS, parity, number of previous CSs, date of last menstrual period, mode of past deliveries, medical course in current pregnancy, and other obstetric and gynecologic history. The final study group comprised 418 subjects. The study participants were randomly assigned into two groups: GA or SA. A computer-generated random number chart Statistical Package for the Social Sciences (SPSS) version 20.0 for Windows (SPSS Inc., Chicago, Illinois, United States) was used for the group randomization. As shown in Figure 1, the GA group comprised 207 participants, and the SA group comprised 211 participants.

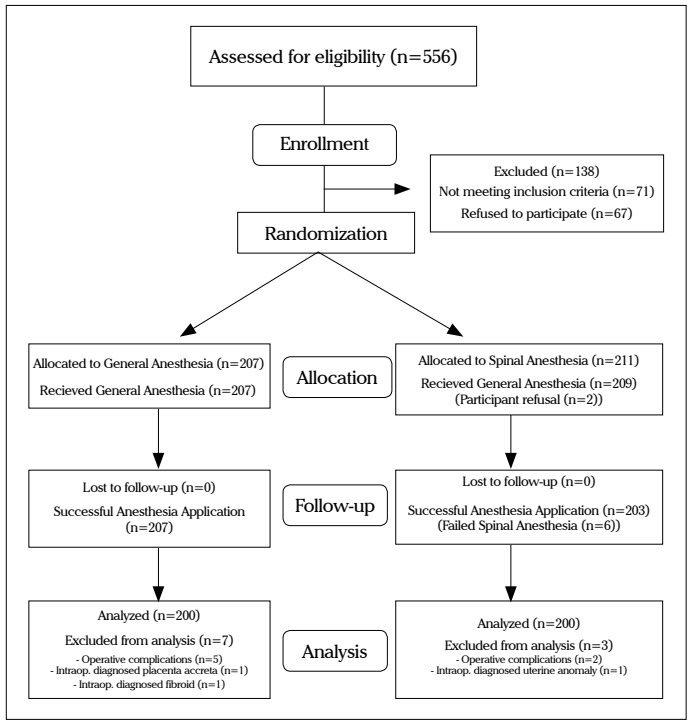

Figure 1. The consort flowchart of study participants

Each subject underwent a comprehensive obstetric and medical exam as well as an obstetric ultrasound to confirm the placentation and gestational week and to exclude any other pelvic or obstetric pathology (such as leiomyoma or abnormal placentation). All of the participants also underwent comprehensive anesthesia counseling and an anesthetic evaluation.

CSs were performed by two obstetricians, each with >6 years of experience, using the same surgical technique, and the surgical details were recorded in a data collection file. The anesthetic was administered by qualified anesthetists with experience in these two anesthetic techniques. The baseline heart rate (HR), noninvasive arterial blood pressure, electrocardiogram (ECG), and arterial oxygen saturation (SpO_2) were monitored, and the data were recorded prior to anesthesia induction. After anesthesia induction, ECG, HR, SpO_2, and respiratory rate were continuously monitored, and blood pressure was measured at 2-min intervals. Before spinal anesthesia, all of the SA group patients received 1000 mL of lactated Ringer solution for preloading. Following preloading, spinal anesthesia was administered at the Lumbal 3-4 or Lumbal 4-5 interspinous level under aseptic technique using a 25-Gauge spinal needle. Hyperbaric bupivacaine 0.5% 8–10 mg with 20 μg fentanyl combined was injected intrathecally over 20 s to achieve a thoracal four sensorial block and then the surgical procedure was allowed to proceed.

In the GA group, GA was induced with 5–7 mg/kg thiopental and 1 mg/kg succinylcholine after preoxygenation. After endo-

tracheal intubation, the patients were ventilated to achieve an end tidal carbon dioxide of 32–35 millimeter of mercury (mmHg), and GA was maintained with 1.5% sevoflurane in oxygen. After delivery, intravenous administration of 2 μg/kg fentanyl, 0.03 mg/kg midazolam, and 0.15 mg/kg rocuronium was initiated, and 1% sevoflurane in 50% oxygen +50% N2O was continued. The anesthesia was discontinued at the end of surgery, and the patients were extubated with a reversal of the drug-induced muscle relaxation.

During surgery, all of the patients were placed in the left lateral supine position to prevent supine hypotension. Immediately following delivery of the infant, slow intravenous bolus dose of 5 international unit (IU) of oxytocin was infused. Additionally, oxytocin infusion (20 IU in 500 mL 0.9% saline over 4 h) was administered. If uterine atony or inadequate uterine contractions were detected by the surgeon, supplemental oxytocin was administered. All of the neonates were evaluated by a pediatrician. In case of hypotension, which is defined as a reduction of the mean arterial pressure by >30% of baseline, the intravenous (IV) fluid infusion rate was increased. If hypotension persisted despite IV fluid loading, 5–10 mg IV ephedrine was administered. Bradycardia, which is defined as the reduction of HR <60 beats per minute (bpm), was immediately treated by injecting 0.5 mg IV atropine.

After surgery, the patients were observed in the recovery room for at least 1 h. The total volume of fluid and all medications administered were recorded. Any blood loss, hypotension, nausea, vomiting, or shivering was also recorded. All of the patients received routine postoperative care. Any postoperative complications were documented. A complete blood count was obtained 12 h after surgery to determine the Hb and Htc concentrations. The follow-up visits were scheduled for 1 week after the operation. No additional follow-up appointments were scheduled. All of the procedures were performed by the same surgical team to eliminate other variables.

Statistical analysis

We planned a study with 220 experimental subjects and 220 control subjects. In a previous study (24), the response within each subject group was normally distributed with a standard deviation of 3.89. If the true difference in the experimental and control means is 2.04, we will be able to reject the null hypothesis that the population means of the experimental and control groups are equal with probability (power) 1. The Type I error probability associated with this test of this null hypothesis is 0.05.

The collected data were analyzed using Statistical Package for Social Sciences software version 17.0 (SPSS Inc., Chicago, IL, United States). The continuous variables were expressed as the mean±standard deviation. The Kolmogorov–Smirnov Goodness of Fit test was used to analyze the sample distribution. The Mann–Whitney U and Student's t-test were used to compare the continuous variables. The paired samples t-test was used to compare the preoperative and postoperative measurements. A two-tailed p value <0.05 was considered statistically significant.

Results

In this study, 556 patients were eligible, whereas 138 patients were excluded. Furthermore, 71 patients refused to participate in the study, and 67 did not meet the inclusion criteria (Figure 1). The final study group included 418 subjects who were randomly divided into two groups. In the GA group, all of the procedures were successfully completed with no complications, and no serious adverse reactions were noted. In six patients in the SA group, SA failed and was converted to GA. These six patients were not included in the analysis. The data of seven patients in the GA group and three in the SA group were also excluded because of intraoperative complications or additional pathological findings. Four hundred patients completed the study, and only data from these 400 patients were used for the analysis.

Mild complications associated with anesthesia, such as nausea, vomiting, shivering, and dizziness, were observed in 12 patients. No severe systemic side effects associated with GA or SA were observed. There was no significant difference between the two groups with respect to the mean patient age, BMI, gravidity, parity, number of nulliparous women or number of previous CSs, as shown in Table 1. The mean age was 26.43±5.71 years in the GA group and 26.37±5.54 years in the SA group. Some demographic and clinical characteristics of two study groups are shown in Table 1. The two study groups were similar in terms of indications for CS as shown in Table 2.

Table 1. Some demographic and clinical characteristics of groups

	General anesthesia (n=200)	Spinal anesthesia (n=200)	p
Age	26.43±5.71	26.37±5.54	0.915
BMI	27.89±4.91	27.62±4.14	0.560
Gravidity	3.18±1.41	3.11±1.32	0.868
Parity	1.51±0.90	1.44±0.84	0.484
Nulliparity	23 (11.5%)	27 (13.5%)	NS
Number of previous CS	1 (0–3)	1 (0–3)	NS

Values are expressed as mean±standard deviation, median (25^{th} percentile–75^{th} percentile) or n (%) as appropriate.
BMI: body mass index; CS: cesarean section; NS: not significant

Table 2. Distribution of indications for cesarean sections of groups

Indication	General anesthesia (n=200)	Spinal anesthesia (n=200)
Previous cesarean section	86 (43%)	83 (41.5%)
CPD	25 (12.5%)	27 (13.5%)
Breech presentation	19 (9.5%)	20 (10%)
Malpresentation	17 (8.5%)	19 (9.5%)
Non-reassuring fetal status	13 (6.5%)	11 (5.5%)
Suspected macrosomia	11 (5.5%)	10 (5%)
Failed induction	10 (5%)	8 (4%)
Others	19 (9.5%)	22 (11%)

CPD: cephalo–pelvic disproportion

Table 3. Comparisons of groups

	General anesthesia (n=200)	Spinal anesthesia (n=200)	p
Preoperative Hb levels	11.81±1.39	12.04±1.21	0.08*
Postoperative Hb levels	10.40±1.39	10.92±1.24	<0.001*
Preoperative Htc levels	35.87±4.00	36.31±3.50	0.239*
Postoperative Htc levels	31.13±3.89	33.17±3.47	<0.001*
Difference of Hb (preoperative–postoperative)	-1.41±.74	-1.12±.68	<0.001**
Difference of Htc (preoperative–postoperative)	-4.74±2.16	-3.14±2.13	<0.001**

Values are expressed as mean±standard deviation.
*Student's t-test
**Mann Whitney U Test
Hb: hemoglobin (gram/deciliter); Htc: hematocrit (%)

The mean preoperative Hb and Htc concentrations were 11.81±1.39 and 35.87±4.00 in the GA group and 12.04±1.21 and 36.31±3.50 in the SA group, respectively (Table 3). There was no significant difference in the preoperative Hb and Htc levels between the two study groups (p=0.08 and p=0.239, respectively). The mean postoperative Hb and Htc levels were 10.40±1.39 and 31.13±3.89 in the GA group and 10.92±1.24 and 33.17±3.47 in the SA group, respectively. The postoperative Hb and Htc values were significantly lower in the GA group than in the SA group (p<0.001). Thus, significantly lower operative blood loss was achieved using SA during elective CS compared with that using GA.

The mean differences between the preoperative and postoperative Hb and Htc values in the GA group were 1.41±0.74 and 4.74±2.16, respectively. The mean differences between the preoperative and postoperative Hb and Htc values in the SA group were 1.12±0.68 and 3.14±2.13, respectively. The differences between the preoperative and postoperative blood values for both study groups were statistically significant (p<0.001) (Figure 2, 3). Four (2%) patients in the GA group required 9 units of blood transfusion, and two (1%) patients in the SA group required 4 units.

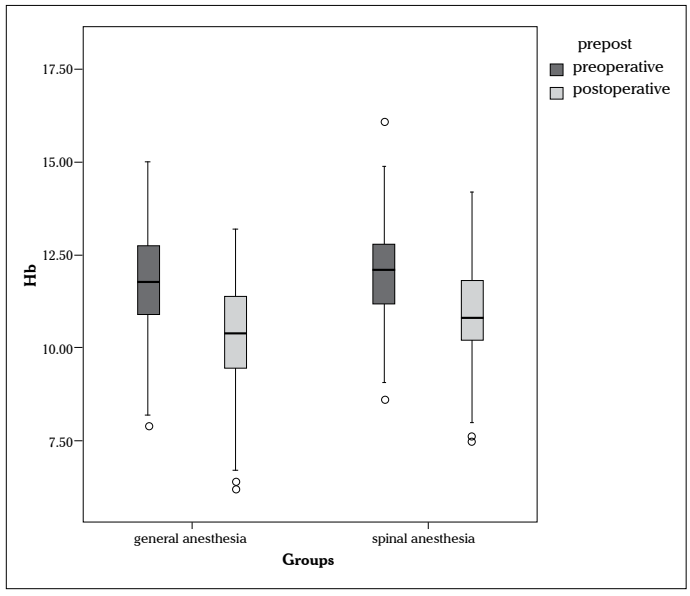

Figure 2. Graphical demonstration of preoperative and postoperative hemoglobin comparisons of groups

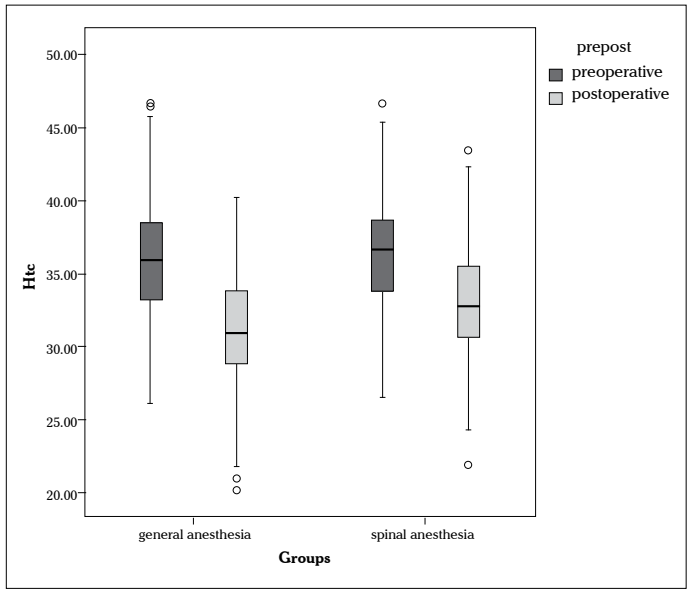

Figure 3. Graphical demonstration of preoperative and postoperative hematocrit comparisons of groups

Discussion

Several clinical studies have been conducted on the obstetric and non-obstetric risk factors for the high operative blood loss in cesarean delivery. A clinical trial conducted by Al-Zirqi et al. (9), evaluating risk factors of obstetric hemorrhage, concluded that uterine atony is the leading cause of obstetric hemorrhage. Several studies performed by different authors have demonstrated that the factors that prevent normal uterine contraction (such as leiomyoma, polihidramnios, uterine rupture, and prolonged labor), abnormal placentation, maternal blood diseases, antepartum/intrapartum blood transfusion, and hypertensive disorders are risk factors for obstetric blood loss (15-17). Other studies have also confirmed that obstetric risk factors, such as parity, gestational age, and fetal macrosomia, contribute to the occurrence of obstetric blood loss (15-17). In 1991, Combs demonstrated that anesthesia is also a risk factor for obstetric hemorrhage (18). It has been reported that adverse uterine contraction and platelet function may be associated with general anesthesia (19).

Obstetric anesthesia has always been a challenging issue for obstetricians and anesthetists. Anesthesia for CS is of particular importance because it affects millions of women worldwide. Both RA and GA are commonly used during cesarean delivery, and both have advantages and disadvantages. In many countries, particularly developed countries, RA is the preferred anesthetic method for CS (20). There are many advantages

of RA compared with those of GA. Regional anesthetics have been associated with less post-operative pain and less nausea. More importantly, RA reduces the incidence of general anesthetic complications and provides an early bonding between the mother and newborn. However, GA is still commonly used in some countries, primarily because of the greater physician familiarity with it (21-23). Thus, it is important to determine which type of anesthesia is safer for use during CS. To date, only a few studies in the literature have focused on the effect of the type of anesthesia used in CS on obstetric blood loss (16, 24-26). The identification of anesthesia-related risk factors may help to develop specific strategies for reducing obstetric blood loss during CS. In general, these studies have focused on the possible link between the anesthesia type and postpartum hemorrhage after cesarean delivery. In a recent large-scale retrospective study, GA was demonstrated to be an independent risk factor for obstetric hemorrhage; patients receiving GA were 8.15 times more likely to experience obstetric hemorrhage than those receiving RA (26). However, the study data were obtained from the Taiwan National Health Insurance Research Dataset, and the diagnoses of obstetric hemorrhage were based on the International Statistical Classification of Diseases and Related Health Problems codes, which were initially designed for billing rather than medical purposes. A systematic review and meta-analysis conducted by Heesen et al. (25), evaluating the effect of general versus RA on estimated blood loss and transfusion requirements after CS, concluded that GA is associated with a greater amount of blood loss than RA. In further analyses, Heesen et al. (25) found a significant difference in the amount of blood loss associated with epidural anesthesia compared with that associated with GA; however, they did not observe a significant difference in the amount of blood loss associated with SA versus GA. The analysis of the well designed, high-quality studies included in this systematic review found no significant increase in the risk of blood transfusions associated with GA. Another systematic review found a significant increase in the risk of blood transfusions with GA; however, this review was based on poorly designed non-randomized studies. Andrews et al. (24) found that GA with halogenated volatile agents was also associated with a greater risk of maternal blood loss compared with RA; however, this study had some limitations, such as an unequal number of patients in the comparison groups, faulty randomization scheme, lack for proper sample size calculations, and lack of allocation concealment. Although reports on operative blood loss during cesarean delivery are primarily based on small heterogeneous groups of patients or during the postpartum period, it is generally widely accepted that blood loss is greater when GA is used instead of RA. However, the higher blood loss associated with GA is of uncertain clinical relevance.

In our study of low-risk patients undergoing elective CS, we found a significantly higher level of blood loss in patients who received GA compared with patients who received SA. Furthermore, more GA patients required blood transfusions than SA patients. Our results are in agreement with Kim et al. (27) and Lertakyamanee et al. (28). Kim et al. (27) retrospectively compared the 287 elective CS patients and concluded that SA is associated with less blood loss during the CS than GA; however, in contrast, they found no significant difference between the two groups with respect to blood loss two days after surgery. The prospective randomized study of Lertakyamanee et al. (28) reported that patients who received GA had significantly increased postoperative blood loss compared with patients who received RA. Our findings are inconsistent with those of Heesen et al. (25) and Yalinkaya et al. (29). Heesen et al. (25) initially concluded that GA was associated with a larger amount of blood loss than RA; however, in a more detailed analysis, they found that compared with GA, there was significantly less blood lost with epidural anesthesia but not with spinal anesthesia. In a prospective trial, including 200 low risk women undergoing CS, Yalınkaya et al. (29) found no significant difference in the operative blood loss between GA and SA groups; however, this study had major limitations, such as the lack of a randomization scheme, proper sample size, and allocation concealment.

In the study by Kim et al. (27), a comparison of the postsurgery and presurgery mean Hb and Htc levels revealed decreases of 13.5% and 12.6%, respectively, in the GA group and decreases of 9.9% and 8.3%, respectively, in the SA group. In our study, the mean Hb and Htc concentrations were reduced 11.9% and 13.2%, respectively, in the GA group and 9.3% and 8.6%, respectively, in the SA group. The mean differences between the preoperative and postoperative Hb and Htc values in the study by Yalınkaya et al. (29) were 1.65 and 4.29, respectively, for the GA group and 1.65 and 4.43, respectively, for the SA group. In our study, the mean differences between the preoperative and postoperative Hb and Htc values were 1.41 and 4.74, respectively, for the GA group and 1.12 and 3.14, respectively, for the SA group (29). The differences we detected in the HB and Htc values for the GA group were similar to those reported by Yalınkaya et al. (29); however, in our study, the mean differences between the preoperative and postoperative Hb and Htc values in the SA group were lower than those reported by Yalınkaya et al. (29). This discrepancy may be related to the differences in the study protocols and the possible biases in the previous study of Yalınkaya et al. (29).

There are some limitations to our study. The use of a single parameter to determine blood loss is a potential limitation. The inclusion of additional parameters would allow for a more objective assessment of blood loss. However, objective determination of blood loss is very difficult to determine for CSs because of amniotic fluid. Another possible limitation of our study is the lack of an epidural anesthesia (EA) group; the ideal study would include a GA, SA, and EA groups.

CSs have been a long-standing global public health concern (12, 13). Obstetric hemorrhage remains a leading cause of maternal morbidity and mortality in both developed and developing countries. Therefore, the prevention of maternal mortality and morbidity due to obstetric hemorrhage will necessarily involve the use of a safe and effective anesthetic technique that causes less bleeding among other life-saving measures. Because of the large number of women who undergo CS each year, strategies designed to reduce CS-related blood loss are of major public health significance. Thus, the effect of different types of anesthesia on obstetric blood loss must be further clarified. In this study, we investigated how anesthesia types

influence the operative blood loss among women scheduled for elective CS. We hypothesized that women who received GA would have a greater amount of operative blood loss than women who received SA due to adverse uterine contraction and platelet function potentially associated with GA.

In conclusion, our study demonstrated that GA is associated with a higher risk of operative blood loss than SA in low risk patients undergoing elective CS. Although this finding is consistent with several other studies, the clinical relevance of this difference in operative blood loss is unclear. Therefore, there is an obvious requirement for well-designed, large-scale, prospective, randomized, and homogenous studies of all of the anesthetic techniques used in major obstetric surgery and their effect of operative blood loss.

Ethics Committee Approval: *Ethics committee approval was received for this study from the Local Institutional ethics committee of Erciyes University.*

Informed Consent: *Written informed consent was obtained from patients who participated in this study.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - H.A., U.A., B.Y.; Design - H.A., U.A., B.Y.; Supervision - T.A.; Resource - H.A.; Materials - U.A., S.S.Ö., G.A., G.G.; Data Collection and/or Processing - U.A., S.S.Ö., G.A., G.G.; Analysis and/or Interpretation - M.A.D.; Literature Search - H.A., B.Y.; Writing - H.A., B.Y.; Critical Reviews - T.A.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Laparoscopy versus laparotomy for the management of endometrial carcinoma in morbidly obese patients: a prospective study

Özgür Bige[1], Ahmet Demir[2], Bahadır Saatli[3], Meral Koyuncuoğlu[4], Uğur Saygılı[3]

[1]Department of Obstetrics and Gynecology, Tekirdağ Star Medica Hospital, Tekirdağ, Turkey

[2]Clinic of Obstetrics and Gynecology, Elazığ Training and Research Hospital, Elazığ, Turkey

[3]Department of Obstetrics and Gynecology, Dokuz Eylül University Faculty of Medicine, İzmir, Turkey

[4]Department of Pathology, Dokuz Eylül University Faculty of Medicine, İzmir, Turkey

Abstract

Objective: To compare the results of total laparoscopic hysterectomy and total abdominal hysterectomy in morbidly obese women with early stage endometrial cancer.

Material and Methods: This prospective study was conducted on 140 morbidly obese women with body mass indices ≥35 kg/m^2 and presenting with clinical stage 1 endometrial cancer. The patients underwent total laparoscopic hysterectomy (n=70) or total abdominal hysterectomy (n=70), bilateral salpingo-oophorectomy, pelvic lymphadenectomy, and peritoneal washing. Age, parity, menopausal status, weight, height, medical problems, history of previous laparotomy, surgical procedure, operative time, estimated amount of blood loss, preoperative hematocrit, postoperative hematocrit, operative complications, conversion to laparotomy, need for intraoperative or postoperative blood transfusion, intraoperative and postoperative complications, secondary surgery, tumor stage, grade, histology, number of recovered lymph nodes, and visual pain scores of the patients were recorded.

Results: Postoperative complications were significantly higher in the laparotomy group. Hospital stay in the laparoscopy group was significantly lower than that in the laparotomy group. The visual pain scores were significantly higher in the laparotomy group on the first, second, and third postoperative days and on the day of discharge from the hospital. Resuming activity took a significantly longer time in the laparotomy group (34.70 days) than in the laparoscopic group (17.89 days).

Conclusion: With the availability of skilled endoscopic surgeons, most obese women with early stage endometrial cancer can be safely managed by performing laparoscopy with an excellent surgical outcome, shorter hospitalization, less postoperative pain, and faster resumption of full activity. (J Turk Ger Gynecol Assoc 2015; 16: 164-9)

Keywords: Laparoscopy, endometrial carcinoma, morbidly obese patients

Received: 09 February, 2015 **Accepted:** 19 April, 2015 **Available Online Date:** 14 July, 2015

Introduction

Endometrial cancer (EC) is the most common gynecologic malignancy among women in Turkey with an incidence of 8.4 cases per 100.000 (1). The standard modality of management of early EC is surgery via laparotomy. Laparoscopic surgery for EC was first reported by Childers and Surwit in 1992 (2). Recently, diverse studies have demonstrated favorable outcomes of laparoscopic surgery for EC.

Most patients with EC are obese (3). The risk of diabetes, cardiovascular disease, and death due to EC is 6.25 times higher in morbidly obese patients (4). Obesity is one of the common public health problems in Turkey, particularly among women. The Turkish population has a higher rate of obesity than European countries; however, the rate is similar with the United States (5). Obesity and other medical conditions often complicate the surgery, thereby increasing the morbidity and mortality rates of the disease. Obesity makes the laparoscopic approach more difficult (6, 7). However, it has been shown that obese patients are benefitted more from laparoscopy. Laparoscopic staging of EC in obese or morbidly obese patients results in fewer operative complications and faster recovery (8-11).

The aim of this study was to compare the laparoscopic approach with laparotomy in morbidly obese Turkish women with early stage EC women with similar clinical characteristics.

Material and Methods

This prospective study was conducted at the Department of Obstetrics and Gynecology, Dokuz Eylül University School of Medicine, İzmir, Turkey from January 2005 to July 2012. The same surgical team performed the surgeries (US, OB, BS). The subjects were morbidly obese clinical stage 1 EC women, with body mass indices (BMIs) ≥35 kg/m^2. The patients

Address for Correspondence: *Özgür Bige, Tekirdağ Star Medica Hastanesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Tekirdağ, Türkiye.*
Phone: +90 505 707 93 99 e.mail: ozgurbigef@yahoo.com

DOI:10.5152/jtgga.2015.15128

who met the inclusion criteria were offered total laparoscopic hysterectomy (TLH), pelvic lymphadenectomy, and peritoneal washing. The patients who refused laparoscopic management underwent laparotomy and were included in the laparotomy group. Patients who previously underwent retroperitoneal surgery and radiation therapy to the lower abdominal region and had severe cardiopulmonary disease, severe orthopedic problems, enlarged uterus preventing vaginal removal, intraperitoneal disease, cervical involvement, and contraindications to laparoscopy were excluded from the study.

Obesity is classified according to the World Health Organization as class I for a BMI between 30 and 34.9 kg/m^2, class II for a BMI between 35 and 39.9 kg/m^2, and class III for a BMI ≥40 kg/m^2. The patients with a BMI ≥35 kg/m^2 were allowed to participate in the study. Informed consent for each patient and approval of the institutional ethics committee were obtained.

All patients underwent bowel preparation preoperatively. Antibiotics prophylaxis in the form of 1000 mg Cefazoline (Cefozin, Bilim İlaç, İstanbul, Turkey) was administered before the skin incision. A low-molecular-weight heparin, Enoxaparin Sodium 40 mg (Clexane, Sanofi Aventis, İstanbul, Turkey), was injected subcutaneously for antithrombotic prophylaxis starting from 12 h before the surgery and continued for 14 days postoperatively. As surgical staging peritoneal washing, TLH or total abdominal hysterectomy, bilateral salpingo-oophorectomy and bilateral pelvic and/or paraaortic lymphadenectomy were performed.

In addition to the general characteristics of the patients surgical, procedure, operative time (OT), estimated amount of blood loss (EBL), hematocrit levels, operative complications, conversion to laparotomy, need of blood transfusion, secondary surgery, tumor stage, grade, histology, number of recovered lymph nodes, and visual pain scores of the patients were recorded.

The time spent from the entry of the Veress needle to the last suture on skin incision was defined as OT. The time spent for paraaortic lymphadenectomy was calculated separately. Estimating the amount of irrigated fluid and the weight of the swabs helped to calculate EBL. The hemoglobin level lower than 8 g/dL or symptomatic anemia was accepted as indications for erythrocyte suspension transfusion. Ureteral, bowel, bladder, vascular injuries, bleeding requiring blood transfusion, and abdominal wall bleeding were defined as intraoperative complications. Analgesia was controlled by Tradamol (Contramal, Abdi İbrahim, İstanbul, Turkey), and Tenoxicam (Tilcotil, Deva, İstanbul, Turkey) was used to relieve the postoperative pain. The time interval between the surgical intervention and discharge of the patient from the hospital was described as the length of hospital stay. Deep vein thrombosis, pulmonary thromboembolism, ileus, gastrointestinal system bleeding, cellulitis, wound infection or infection requiring antibiotherapy, port site herniation, and evisceration or eventration occurring within 30 days after surgery were determined as postoperative complications. The patients recovered within 3- and 6-month time periods for the first and second years after surgical intervention, respectively.

Surgical intervention

Laparotomy was performed according to the International Federation of Gynecology and Obstetrics (FIGO) staging system defined in 1988 (12). The TLH procedures were performed according to the classification system described by Garry et al. (13). A closed entry technique with the Veress needle and carbon dioxide gas insufflation was used. Following the establishment of pneumoperitoneum, a camera was placed through the umbilicus. Totally, two 10 mm and two 5 mm trocars were inserted into the abdomen. A laparoscopic sealer/divider instrument, 10 mm LigaSure AtlasTM (Valleylab, Covidien, Minneapolis, United States), was used in all procedures. Round ligaments were divided and retroperitoneal spaces were established bilaterally. The uterine arteries were first identified and ligated. Then, the infundibulopelvic ligaments were transsected by LigaSure. Following dissection of the anterior and posterior peritoneum, uterosacral and cardinal ligaments were divided. Vaginal fornixes were delineated and circular colpotomy was performed using unipolar hook cautery. All the specimens were retrieved from the vagina. The vaginal cuff was closed with intracorporal 1/0 Polyglycolide-co-Lactide sutures (Pegelak, Doğsan, Trabzon, Turkey).

All patients underwent pelvic lymph node dissection regardless of the grade of the disease. The paraaortic lymphadenectomy was performed in the case of the surgical stage of IB–IV for all grades or in a case of high-risk histology such as clear cell or papillary serous adenocarcinoma. The external iliac artery and vein, the internal iliac artery and vein, the iliac bifurcation, and the obturator nerve were clearly visible at the end of the pelvic lymphadenectomy. Omentectomy was performed in the cases of high-risk histology. Frozen section analysis was performed in all cases. During paraffin section analysis, tumor deposits and positive lymph nodes were discriminated.

A comparison of patient characteristics between the groups was performed using a two-sample *t* test, Chi square, and Fisher's exact test. The total sample size (n=140) resulted in a power of 80% with an α error of 0.05. All the statistical analyses were performed using the Statistics Software Package for the Social Sciences (SPSS) version 15.0 (SPSS Inc, Chicago, Illinois, United States). Two-tailed p values <0.05 were considered as statistically significant.

Results

Totally, 140 morbidly obese women with clinical early stage EC who met the inclusion criteria were included in the study. The study participants were allocated to either the laparoscopy group (n=70) or the laparotomy group (n=70).

Of 70 patients, six laparoscopic procedures converted to laparotomy. The conversion rate was 6/70 (8.6%). Advanced stage disease (n=3), vascular injury (n=1), dense adhesions (n=1), and intestinal injury (n=1) were considered as underlying causes of conversion to laparotomy. These patients were not excluded from the laparoscopy group in further analysis.

There were no significant differences in age, BMI, comorbidities, previous laparotomy, and operative procedures (Table 1). Table 2 illustrates the International Federation of Gynecology and Obstetrics (FIGO) stages, histologies, and grades of the tumors that were similar among women in both groups. There were significant differences between the two groups with respect

Table 1. Patient characteristics

	TLH (n=70)	TAH (n=70)	p
Age (years)*	55.56±10.62	56.24±10.55	NS
Body mass index (BMI; kg/m^2)*	44.49±6.99	45.90±7.22	NS
Comorbidities**			
One	23 (32.9)	20 (28.6)	NS
≥Two	42 (60.0)	44 (62.9)	NS
Previous Laparotomy**	24 (34.3)	19 (27.1)	NS
Procedure**			
Hysterectomy + PLND	62 (88.57%)	61 (87.14%)	NS
Hysterectomy + PLND+PALND	8 (11.43%)	9 (12.86%)	NS

*mean±SD, ** number, %
TLH: total laparoscopic hysterectomy; TAH: total abdominal hysterectomy; PLND: pelvic lymph node dissection; PALND: paraaortic lymph node dissection; NS: nonsignificant

Table 2. Stage and grade of the operations

	TLH (n=70)	TAH (n=70)	p
FIGO Stage			
I–II	67	68	
III–IV	3	2	
Histology			
Endometrioid	64	63	NS
Papillary serous	2	3	NS
Clear cell	2	2	NS
Endometrial stromal sarcoma	1	0	NS
Mixed mullerian tumor	1	2	NS
Grade (n, %)			
1	36 (51.4%)	40 (57.1%)	NS
2	26 (37.14%)	22 (31.4%)	NS
3	8 (14.28%)	8 (11.4%)	NS

TLH: total laparoscopic hysterectomy; TAH: total abdominal hysterectomy; FIGO: international federation of gynecology and obstetrics; NS: nonsignificant

to OT and EBL. The mean OT was 155.03±37.68 (124-340) min with EBL of 561.86±341.55 (254-1800 mL) and 185.94±30.26 (130-245) min with EBL of 438.29±271.97 (290-1250 mL) in the laparoscopy and laparotomy groups, respectively. There were no significant differences between the number of intraoperative and postoperative blood transfusions and the number of lymph nodes collected (Table 3). The complication rates are illustrated in Table 4. There were no significant differences in the rates of the intraoperative complications of both groups. However, postoperative complications were significantly higher in the laparotomy group.

Table 3. Characteristics of the operations

	TLH (n=70)	TAH (n=70)	p
Operating room time (min)*	155.03±37.68	185.94±30.26	<0.001
Estimated amount of blood loss (mL)*	561.86±341.55	438.29±271.97	<0.05
Intraoperative blood transfusion**	12 (17.1%)	10 (14.2%)	NS
Postoperative blood transfusion**	6 (8.6 %)	7 (10.0%)	NS
Lymph node count*	22.99±6.7	23.53±7.11	NS
Pelvic + Common iliac Paraaortic	10.50±7.23	14.88±5.8	NS

*mean±SD, **n (%)
TLH: total laparoscopic hysterectomy; TAH: total abdominal hysterectomy; NS: nonsignificant

Table 4. Intra- and postoperative complications

	TLH (n=70)	TAH (n=70)	p
Intraoperative complications (n, %)	5 (7.14%)	1 (1.43%)	
Vascular injury requiring intervention	1	-	NS
Bowel injury	2	-	
Bladder injury	1	-	
Hematoma requiring intervention	1	1	
Postoperative complications (n, %)	8 (11.4%)	21 (30.0%)	0.01
Deep vein thrombosis	0	1	
Post incisional or port-site hernia	1	5	
Cellulitis	1	4	
Wound infection	0	3	
Wound dehiscence	0	1	
Ileus	1	2	
Ureterovaginal fistula	0	1	
Acute renal failure	1	0	
Intensive care admission	3	4	
Re-laparotomy	1	0	

TLH: total laparoscopic hysterectomy; TAH: total abdominal hysterectomy; NS: nonsignificant

Of the four intraoperative complications that occurred in the laparoscopy group, one of them required further reoperation by laparotomy and the other required conversion to laparotomy. In the first case, there were dense adhesions, including omentum on the left pelvic side wall due to previous left oophorectomy. Partial omentectomy and adhesiolysis was performed. Acute abdomen developed on the 7th postoperative day. Body temperature, C-reactive protein, and white blood cell levels were

elevated. Sigmoid colon injury was detected after tomographic examination. Colostomy (Hartman) was performed on the same day. The patient started to experience pain on the left leg; hypotension and severe dyspnea developed on the 12th postoperative day. Thrombus in the left external iliac vein and pelvic abscess were detected on ultrasonography. The patient was reoperated. Thrombolectomy and pelvic abscess drainage were performed. Unfortunately, massive internal bleeding developed in the patient 1 h later after completing the operation. A wide damage in the iliac artery was noticed after draining the hematoma. The iliac artery was ligated and femora-femoral bypass was performed. The patient was discharged from the hospital 35 days after the first operation. In the second case, a vascular injury that occurred during the laparoscopic nodal dissection required laparotomy, and bilateral internal iliac arteries were ligated to stop the bleeding.

Hospital stay in the laparoscopy group was significantly lower than that in the laparotomy group. To determine the level of pain or describe the discomfort of the patients, a visual pain scale was used. The visual pain scores were significantly higher in laparotomy group on the first, second, and third postoperative days and on the day of discharge from the hospital. Resuming activity means performing only light household chores. It took a significantly longer time for the laparotomy group (34.70 days) to perform such activities than the laparoscopic group (17.89 days). There was only one recurrence in the laparotomy group but none in the laparoscopic group. There was no occurrence of death intraoperatively and immediately after the operation. The mean follow-up periods were similar (31.14 vs. 34.80 months in the laparoscopy and laparotomy groups, respectively). The death rates were same in the two groups. In the laparotomy group, one patient died because of pelvic recurrence after 24 months postoperatively and one patient died because of cardiac reasons 61 months postoperatively. In the laparoscopy group, two patients died during the follow-up period. One was due to urosepsis and the other was due to acute pyelonephritis and secondary bacteraemia after 20 and 24 months of the follow-up period, respectively (Table 5). The 3-year progression-free survival for the laparoscopy group was 100% and 98.57% in the laparotomy group. The corresponding 3-year overall survival rates were 97.14% and 98.57% in the laparoscopy and laparotomy groups, respectively.

Table 5. Postoperative follow-up characteristics of the operations

	TLH (n=70)	TAH (n=70)	p
Postoperative hospital stay (days)*	4.64±4.68	10.36±5.69	<0.001
Postoperative pain (VAS)*			
First day	4.13±1.54	6.60±1.23	<0.001
Second day	2.80±0.94	5.67±1.94	<0.001
Third day	2.27±0.88	4.66±1.97	<0.001
At the time of discharge from the hospital	1.96±0.89	4.41±2.17	<0.001
Resuming full activity*	17.89±11.52	34.70±18.21	<0.001
Recurrence**	0	1 (1.42%)	NS
Death**	2 (2.86%)	2 (2.86%)	NS
Follow-up period (months)*	31.14±19.00	34.80±16.55	NS
Progression-free survival** (3 years)	70 (100%)	69 (98.57%)	NS
Overall survival** (3 years)	68 (97.14%)	69 (98.57%)	NS

* mean±SD, ** n (%)
TLH: total laparoscopic hysterectomy; TAH: total abdominal hysterectomy; VAS: visual pain score; NS: nonsignificant

Discussion

Obese women are at a risk for developing EC (14). They have greater surgical and anesthetic risks. The recovery and wound healing take a longer time (15). Laparoscopic surgery for EC in obese patients as an alternative to laparotomy has been the subject of many studies during the past 10 years, and it has been associated with fewer operative complications and more rapid recovery (8-11). However, the results of the trials comparing laparotomy with laparoscopy are indiscriminate because of the heterogeneity of the inclusion criteria, surgical techniques, and extent and rate of lymphadenectomy performed. Therefore, to prevent the selection bias, our study was performed only in one center by the same surgical team. All the participants underwent pelvic lymph node dissection systematically and were followed by the same clinicians postoperatively in the clinic and after being discharged from the hospital.

The current study shows a significantly shorter operating room time and higher EBL in the laparoscopy group. The increase in blood loss may be secondary to the frequent use of irrigation and suctioning, limited number of options to stop the bleeding, and reduced vision during laparoscopy. Although there was a significant difference in EBL, the rates of intraoperative and postoperative blood transfusions were not different.

The mean operating room time was significantly shorter in laparoscopic surgery, contrary to most reports published previously (8, 10, 11, 16). Faster entry into the abdomen via a closed establishment of the pneumoperitoneum in laparoscopic access and well-trained endoscopic surgeons are the main factors that shorten the OT in laparoscopic surgery. The entry and closure of the abdomen took quite a long time, which lengthens the OT in patients in the laparotomy group.

Lymph node count has been used as a marker for the quality of staging in EC. Therefore, lymphadenectomy is an important step in gynecologic oncology. There were conflicting evidences in the literature regarding lymph node counts (8-11). Tumor staging should be accurate. The interobserver variability can be seen among pathologists about the evaluation of positive lymph nodes and tumor deposits (17). In addition to interpathologist variations, BMI also influences the final lymph node count in EC staging (18). We performed complete pelvic lymphadenectomy to all patients to increase the strength of the study. To prevent interpathologist variations, frozen and paraffin section analyses were performed by the same pathologists who are experienced in the gynecologic oncology field. In the cur-

rent study, the average lymph node counts are not statistically different according to the procedure performed.

Several studies have demonstrated that laparoscopy causes lesser complications than laparotomy in obese women (7, 8, 16, 19-24). In the current study, there was no significant difference between both the groups with respect to the incidence of operative complications. However, postoperative complications were significantly higher in the laparotomy group. The most common complications were post-incisional hernia, cellulitis, and wound infections. The wound complications were significantly lower in the laparoscopy group (2.85% vs. 18.57%, p=0.002) than the laparotomy group because of a smaller wound size. Deep vein thrombosis, ileus, and intensive care admissions were also lower in the laparoscopy group.

The conversion rate to laparotomy changes between 7.5% and 36% and increases proportionally with BMI (7, 8, 25). A higher conversion rate has been described in patients with a high BMI (23). The conversion rate was 8.6% in our study and consistent with the literature. Two of the four intraoperative complications in the laparoscopy group resulted in conversion to laparotomy. In the first case, a vascular injury that occurred during the laparoscopic nodal dissection required laparotomy, and the bilateral internal iliac arteries were ligated to stop the bleeding. In the second case, the ileum was injured during adhesiolysis because of a previous appendectomy. A linear incision was formed 4 cm in length, the injured region was resected, and end-to-end anastomosis was performed laparotomically. In the first case of other two intraoperative complications without conversion to laparotomy, the urinary bladder was injured and repaired laparoscopically. In the second case, the sigmoid colon and iliac artery injuries were detected postoperatively. Both patients also fully recovered and had no permanent damage.

With respect to hospital stay, laparotomy in the obese patients prolongs hospital stay (7, 8, 10, 11, 15, 26-28). Similarly, in our study, there was a significant difference (5.2 vs. 12.8 days, p<0.001) between women who underwent laparoscopy and those who underwent laparotomy. This difference mostly originated from the higher rate of postoperative complications in the laparotomy group.

We observed that patients managed by laparoscopy experience significantly less pain on the first, second, and third postoperative days and also on the day of discharge from the hospital. They resumed full activity sooner than the laparotomy group. The smaller incisions, absence of bowel manipulation, and less exposure during laparoscopy to air decreases the postoperative pain and ileus and allows early ambulation and early discharge from the hospital.

Only one case of recurrence has been detected after a 36-month follow-up period in a study cohort. Four patients died because of various reasons. In the laparoscopy group, two patients died because of urosepsis and acute pyelonephritis with secondary bacteraemia after 20 and 24 months of follow-up periods, respectively. Postoperatively, in the laparotomy group, two patients died because of pelvic recurrence and cardiac disease after 24 and 60 months after discharge, respectively. None of the patients died for reasons connected to the operation. There was no significant difference with respect to either the overall survival or progression-free survival between the laparoscopy group and the laparotomy group.

Our study is a prospective but not a randomized study. Some patients that should have been operated by the laparoscopic route according to randomization demanded to be operated by laparotomy. This is a limitation of our study. Recently, robotic surgery has been used in gynecologic cancers. A comparison of laparoscopic versus robotic surgery in morbidly obese EC patients may be the subject of future studies.

In conclusion, obese women are at a higher risk of developing EC. The type of surgical management of the disease in morbidly obese women affects the operative morbidity. With the availability of skilled endoscopic surgeons, a laparoscopic approach does not increase the intraoperative morbidity related to surgery and it has favorable surgical outcomes, shorter hospitalization, less postoperative pain, and faster resumption of full activity postoperatively.

Ethics Committee Approval: *Ethics committee approval was received for this study from the Local Institutional ethics committee of Dokuz Eylül Üniversity Faculty of Medicine.*

Informed Consent: *Written informed consent was obtained from patients who participated in this study.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - Ö.B., A.D., U.S.; Design - Ö.B., A.D., B.S.; Supervision - Ö.B., B.S., U.S.; Resource - Ö.B., A.D., U.S.; Materials - Ö.B., A.D., M.K.; Data Collection and/or Processing - Ö.B., B.S., U.S.; Analysis and/or Interpretation - Ö.B., A.D., B.S.; Literature Search - Ö.B., B.S., U.S.; Writing - Ö.B., A.D., U.S.; Critical Reviews - Ö.B., U.S., M.K.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Normal ranges of biorbital and interorbital distances in healthy Turkish pregnancies at 19–23 weeks of gestation and correlation with craniofacial structures

Halil Gürsoy Pala, Burcu Artunç-Ülkümen, Faik Mümtaz Koyuncu, Yıldız Uyar, Yeşim Bülbül-Baytur

Department of Obstetrics and Gynecology, Division of Perinatology, Celal Bayar University Faculty of Medicine, Manisa, Turkey

Abstract

Objective: We aimed to determine the normal ranges for biorbital (BOD) and interorbital distances (IOD) during the second trimester in Turkish women with normal pregnancies and to assess the correlation between BOD, IOD, and other fetal craniofacial structures and biometric parameters.

Material and Methods: Our retrospective study comprised 1328 women with singleton normal pregnancies who had undergone ultrasonography (USG) examinations at 19–23 weeks of gestation in the second trimester screening. The measurements of BOD and IOD were obtained with the coronal section of the fetal face at the plane of orbits.

Results: Mean BOD was 3.4±0.33 cm, whereas mean IOD was 1.28±0.24 cm. Correlation analysis revealed that BOD was significantly correlated with IOD, transcerebellar diameter (TCD), cisterna manga (CM), nuchal fold (NF), nasal bone (NB), biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), femur length (FL), and gestational week. There was a significant relation between IOD and the lateral ventricle posterior horn, TCD, CM, NF, NB, BPD, HC, AC, and FL.

Conclusion: The reference ranges obtained in our study enabled accurate evaluation of BOD and IOD in the second trimester of normal pregnancies. USG detection of fetal orbital biometric anomalies may alert the clinician for different anomalies associated with abnormal development of eye. (J Turk Ger Gynecol Assoc 2015; 16: 170-3)

Keywords: Biorbital distance, interorbital distance, mid-trimester scan, Turkish population

Received: 31 March, 2015 **Accepted:** 19 April, 2015 **Available Online Date:** 14 July, 2015

Introduction

The anomalies of the fetal face, including orbits, can be detected on ultrasonography (USG) (1). On USG, the orbitas appear as hypoechoic circles in the skull of fetus with the echogenic circle of the lens within it. USG can be used to measure the biorbital distance (BOD) and interorbital distance (IOD) in particular (2). Furthermore, these values can be useful for the estimation of gestational age. Prenatal evaluation of fetal orbit growth is superior for the early assessment of some facial and cranial abnormalities (3, 4). Moreover, many morphological parameters that are revealed on USG in the second trimester of pregnancy are reported to be associated with genetic abnormalities (5, 6). The ocular biometric parameters can be helpful in detecting anomalies involving the fetal orbital development that can be indicative of aneuploidy and various anomalies (7).

The growth and improvement of the face are associated to the forebrain development (8). Therefore, the defects of the cerebral and face are usually related to each other (7), and the biometry of the orbits could be a practical USG value for early assessment of some abnormalities related to the maldevelopment of the fetal orbits.

The aim of second trimester USG scan is to obtain exact diagnostic knowledge for optimized perinatal management with best possible results for fetus and mother. This protocol is used to conclude the age of gestation and obtain the measurements of fetus to determine the growth anomalies in late pregnancy (9).

Therefore, the objectives of our study were to determine normal ranges of BOD and IOD at 19–23 weeks of gestation in Turkish women with normal pregnancies and to assess the correlation between BOD, IOD, and other fetal craniofacial structures and biometric parameters.

Material and Methods

This retrospective study comprised 1328 women with singleton pregnancies who had undergone USG examinations between May 2013 and September 2014 at our perinatology outpatient clinic at 19–23 weeks of gestation for the second trimester screening. All the pregnant women provided their

Address for Correspondence: *Halil Gürsoy Pala, Celal Bayar Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Perinatoloji Bilim Dalı, Manisa, Türkiye.*

Phone: +90 505 525 23 32 e.mail: gursoypala@yahoo.com

DOI:10.5152/jtgga.2015.15062

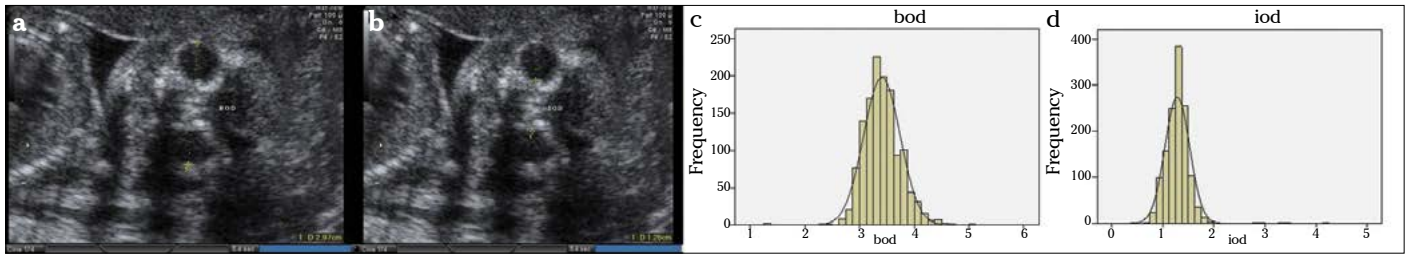

Figure 1. a-d. Measurement of biorbital distance (BOD) in coronal plane (a), Measurement of interorbital distance (IOD) in coronal plane (b), Distribution of BOD values of healthy fetuses in second trimester (c), Distribution of IOD values of healthy fetuses in second trimester (X-axis: BOD and IOD values) (Y-axis: Frequencies) (d)

Table 1. Demographic and ultrasonographic features of the study

n: 1328	Mean	Standard deviation	Minimum	Maximum
Age	28.07	5.61	17	43
Gestational week	20.48	2.24	19	23
Lateral ventricle posterior horn (mm)	4.7	2.04	2.82	9.77
Cisterna magna (mm)	4.08	1.7	2.22	9.07
Nuchal fold (mm)	4.93	3.8	2.4	5.9
Nasal bone (mm)	4.85	1.08	2.81	6.4
Transcerebellar diameter (mm)	22.04	2.73	19.04	25.35
Biparietal diameter (cm)	5.19	0.5	3.97	5.98
Head circumference (cm)	18.41	4.46	6.21	24.12
Abdominal circumference (cm)	17.47	1.88	14.67	22.9
Femur length (cm)	3.77	0.5	2.9	4.88

informed consent for the second trimester scan. Women with multiple pregnancies; chronic systemic disease, such as vasculitis, connective tissue disorder, diabetes, and hepatic or renal failure; and pregnancies with fetal structural or chromosomal anomaly, preeclampsia, and intrauterine growth retardation were not included in the study. The age of gestation was calculated from the first day of the last menstruation and confirmed again by the USG crown-rump length value of the first trimester. The maternal age and parity were also recorded. The local institutional ethics committee approved our study.

Ultrasound exams were performed with a GE Voluson 730-Pro system and a RAB 3.5 MHz array abdominal probe (GE Medical Systems, Milwaukee, WI). All examinations were performed with the use of a transabdominal probe by two operators who had completed the internet-based course on antenatal surveillance and were also accredited with the "Certificate of Competence" by Fetal Medicine Foundation. Examinations were conducted by one of the operators, while the other operator was independently observing the measurements. Head circumference (HC), biparietal diameter (BPD), abdominal circumference (AC), and femur length (FL) were measured for fetal biometry.

As a part of the mid-trimester, BOD and IOD were measured in all fetuses. The measurements of BOD and IOD were obtained with the coronal section of the fetal face at the plane of orbits in which the USG image was symmetrical with the two eye balls of largest and equal diameter (4). The orientation of the probe was re-adapted during successive viewing till the optimal sight of the orbits was possible. BOD is clarified as the distance between the lateral borders of two orbits (Figure 1a); IOD is clarified as the distance between the medial borders of two orbits (Figure 1b) (4). Freeze-frame USG functions and electronic calipers were set for the measurements of orbitas. BOD and IOD were measured three times, the mean value was obtained, and orbital measurements at gestational age were also recorded (10).

Transcerebellar diameter (TCD), cisterna magna (CM), and nuchal fold (NF) were measured on the transcerebellar plane. Lateral ventricle posterior horn (VP) was measured on the transventricular plane. Nasal bone (NB) was measured on the median sagittal facial profile plane.

Statistical analysis was performed with SPSS v.20 (SPSS Inc., Chicago, Illinois, United States). The results of the study were expressed as mean±standard deviation. Spearmen's correlation analysis was used to investigate the association between BOD, IOD, and other parameters. A p value <0.05 was considered to be statistically significant.

Results

In this study, 1328 scans at 19–23 weeks of gestation were included. Mean maternal age was 28.07±5.61, while mean gestational age was 20.48±2.24 weeks. Mean BOD was 3.4±0.33 cm, while mean IOD was 1.28±0.24 cm. The distribution of BOD and IOD values of healthy fetuses in the second trimester is shown in Figure 1c, d. The demographic and ultrasonographic features of the study are shown in Table 1.

Correlation analysis revealed that BOD was significantly correlated with IOD ($r=0.395$, $p<0.001$), TCD ($r=0.404$, $p<0.001$), CM ($r=0.181$, $p<0.001$), NF ($r=0.226$, $p<0.001$), NB ($r=0.879$, $p<0.001$), BPD ($r=0.816$, $p<0.001$), HC ($r=0.844$, $p<0.001$), AC ($r=0.857$, $p<0.001$), FL ($r=0.816$, $p<0.001$), and gestational week ($r=0.558$, $p=0.002$). There was significant relation between IOD and Vp ($r=0.116$, $p<0.001$), TCD ($r=0.966$, $p<0.001$), CM ($r=0.065$, $p=0.03$), NF ($r=0.538$, $p<0.001$), NB ($r=0.884$, $p<0.001$), BPD ($r=0.569$, $p=0.002$), HC($r=0.527$, $p=0.005$), AC ($r=0.609$, $p=0.001$), and FL ($r=0.516$, $p=0.006$). Correlation analysis is shown in Table 2.

Table 2. Correlation analysis of biorbital and interorbital distances with other second trimester craniofacial structures and fetal biometry parameters

	Biorbital distance		Interorbital distance	
	r	p	r	p
TCD	0.404	<0.001	0.966	<0.001
NF	0.226	<0.001	0.538	<0.001
NB	0.879	<0.001	0.884	<0.001
Gestational week	0.558	0.002	0.267	0.1
BPD	0.816	<0.001	0.569	0.002
HC	0.844	<0.001	0.527	0.005
AC	0.857	<0.001	0.609	0.001
FL	0.816	<0.001	0.516	0.006

p<0.05 was significant
TCD: transcerebellar diameter; NF: nuchal fold; NB: nasal bone; BPD: biparietal diameter; HC: head circumference; AC: abdominal circumference; FL: femur length

Discussion

When performing a second trimester USG scan, the evaluation of the face is believed to be an important feature of fetal anatomic survey (9). It is useful in diagnosing associated brain abnormalities, (7) and is also associated for a genetic syndrome (11). Birnholz et al. (12) examined a relation between delayed cerebral development and reduced ocular growth. We examined highly significant correlation between IOD and BOD with craniofacial measurements. Our study results confirm previous hypotheses regarding the association between the growth of the eyes and facial and brain structures. Therefore, the reference ranges for fetal BOD and IOD that we determined appear to reflect the expected fetal development and adds valuable knowledge regarding the growth and development of the brain and facial structures.

In this study, we used the coronal section to measure BOD and IOD because the lateral edges of BOD and IOD could be better defined in coronal section than in the transverse section. The determination of the reference ranges for fetal BOD and IOD may prove to be important in allowing detection of hypo and hypertelorism. Abnormal BOD and IOD measurements could be associated with a broad range of detectable anomalies (13). The most common abnormalities are cleft lip-palate, facial asymmetry, agenesis of corpus callosum, holoprosencephaly, craniosynostosis, microcephaly, macrocephaly, and chromosome anomalies, such as trisomy 21, 18, and 13, and triploidy (14). BOD and IOD may be used to evaluate the normal growth and development of the eye and as a complementary device in the elaboration of different anomalies associated to cranial and facial malformations.

BPD, HC, AC, and FL have been used to evaluate fetal biometry. Moreover, there are several studies regarding fetal eye biometry (15). Jeanty et al. (16) studied the normal fetal orbital biometry. Previous growth charts for the fetal eye have mainly focused on the bony distances (10-12). It is critical to determine the normal values of eye growth during the second trimester of normal gestations. Our study revealed that in a Turkish population, gestational age is significantly correlated to biorbital diameter. This data may be helpful in pregnancies at risk for chromosomal disorders, which include fetal orbital abnormalities. Further studies are required to determine whether these measurements, alone or in combination with other ultrasonographic cranial or facial values, prove to be a useful device to screen fetuses for genetic diseases.

The main limitations of this study were the retrospective single center design and the lack of the postnatal long term outcomes. The advantage of our study was the large sample size for statistical significance. Future multi-center prospective studies with postnatal long term outcomes may be determined with the use of BOD and IOD alone or in combination with other ultrasonographic measurements for chromosomal abnormality screening.

In conclusion, to the best of our knowledge, this study is first to demonstrate normal ranges of BOD and IOD during the second trimester in a healthy Turkish population. The orbital diameter measurement results of our study may contribute as reference values of our population for further studies. Fetal orbital biometric anomalies may be accompanied with other structural anomalies. Furthermore, a normal second trimester USG scan cannot absolutely exclude abnormal development of the orbitas because some of the ocular defects are detected during the late periods of pregnancy.

Ethics Committee Approval: *Ethics committee approval was received for this study from the Local Institutional ethics committee of Celal Bayar University.*

Informed Consent: *Written informed consent was obtained from patients who participated in this study.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - H.G.P., B.A.U.; Design - H.G.P., B.A.U., Y.B.B.; Supervision - Y.B.B.; Resource - H.G.P., B.A.U., F.M.K., Y.U., Y.B.B.; Materials - H.G.P., B.A.U., F.M.K., Y.U., Y.B.B.; Data Collection and/or Processing - H.G.P., B.A.U.; Analysis and/or Interpretation - H.G.P., B.A.U.; Literature Search - H.G.P.; Writing - H.G.P., B.A.U.; Critical Reviews - F.M.K., Y.U., Y.B.B.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Glyceryl trinitrate for the treatment of preterm labor

Şafak Çalışkan[1], Mehmet Ali Narin[2], Faruk Suat Dede[3], Raziye Narin[4], Hülya Dede[5], Ömer Kandemir[3]

[1]Clinic of Obstetrics and Gynecology, Nazilli State Hospital, Aydın, Turkey

[2]Department of Obstetrics and Gynecology, Erzincan University Faculty of Medicine, Erzincan, Turkey

[3]Clinic of Obstetrics and Gynecology, Etlik Zübeyde Hanım Training and Research Hospital Ankara, Turkey

[4]Clinic of Obstetrics and Gynecology, Numune Training and Research Hospital, Adana, Turkey

[5]Clinic of Obstetrics and Gynecology, Zekai Tahir Burak Training and Research Hospital, Ankara, Turkey

Abstract

Objective: This study was conducted to compare the tocolytic efficacy of glyceryltrinitrate (GTN) with that of magnesium sulfate (MgSO4) and to investigate serum nitric oxide metabolites before and after tocolysis.

Material and Methods: In total, 48 women between 27 and 34 weeks' gestation with threatened preterm labor and intact membranes were randomly allocated to receive either GTN or $MgSO_4$ tocolysis. Main outcome measures included tocolytic efficacy and maternal side effect(s) of the tocolytic agent. Obstetric and neonatal outcomes as well as pretreatment and posttreatment nitric oxide (NO) metabolites were assessed.

Results: Forty-one patients were included into the final analysis. Uterine contraction cessation times were 3.66±1.28 and 6.83±3.47 hours for GTN and MgSO4 groups, respectively. Similarly, maternal side effects were significantly lower in the GTN group than in the MgSO4 group, and no serious maternal side effects were recorded. Serum NO metabolite levels before treatment were significantly lower in the treatment groups than in the controls. Serum nitrite levels were significantly increased after tocolytic treatment both in $MgSO_4$ and GTN groups.

Conclusion: GTN effectively delays preterm delivery and reduces neonatal morbidity and mortality with less maternal side effects and seems to be an effective and safe alternative to $MgSO_4$. (J Turk Ger Gynecol Assoc 2015; 16: 174-8)

Keywords: Glyceryl trinitrate, nitric oxide, magnesium sulfate, tocolysis

Received: 28 January, 2015 **Accepted:** 24 March, 2015 **Available Online Date:** 14 July, 2015

Introduction

Preterm delivery is defined as birth before 37 completed weeks of gestation (1). Preterm birth complicates up to 10% of pregnancies and is the major cause of perinatal morbidity and mortality (2, 3). Despite advances in perinatal medicine, the incidence continues to increase (4, 5). The aim of tocolysis is to reduce neonatal morbidity and mortality by delaying birth, enabling corticosteroid administration or maternal transfer to a tertiary care center (6, 7). However, currently available tocolytics have poor efficacy and have not improved neonatal outcomes; furthermore, tocolytic agents have many maternal and fetal side effects, which generally limit their clinical usefulness (6). Human and animal studies suggest that nitric oxide (NO) is involved in the complex interplay of molecular activities, which regulate myometrial contractility (8-10). NO synthesis has been increased during pregnancy for maintaining a quiescent uterus and decreased during labor, thereby allowing uterine contractility to proceed to delivery (11-13). Some limited clinical studies have demonstrated that NO donors such as glyceryl trinitrate (GTN) can arrest preterm labor with less maternal/fetal side effects compared with other agents (14-17). However, contradictory data have been reported, stating that NO donors may have no myometrial effect or may decrease myometrial activity (18-20). In most of these studies, GTN was compared with betamimetics; however, there has been no comparison of GTN with magnesium sulfate in terms of tocolytic activity and safety. The aim of the present study was to compare the efficacy and safety of GTN with those of magnesium sulfate ($MgSO_4$) for the treatment of preterm labor.

Material and Methods

This prospective, randomized, controlled study was conducted at the Obstetrics Department of a tertiary, referral, teaching, and research hospital. The study protocol was approved by the institutional research and local ethics committee.

Study participants

In total, 48 women from $27^{0/7}$weeks to $34^{0/7}$weeks of gestation who were in threatened preterm labor were randomly allocated to receive either GTN (n=25) or $MgSO_4$ (n=23) tocolysis, and the control group consisted of 25 pregnant women who were between the same gestational age and had no signs of threatened preterm labor.

Preterm labor was defined as the clinical diagnosis of at least two painful, regular uterine contractions every 10 minutes and evidence of cervical change (change in Bishop score or Bishop score>6). Inclusion criteria were single pregnancy

Address for Correspondence: *Mehmet Ali Narin, Erzincan Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Erzincan, Türkiye. Phone: +90 542 512 82 82 e.mail: mali_narin@yahoo.com*

DOI:10.5152/jtgga.2015.15016

with intact amniotic membrane, reassuring fetal heart rate (FHR) tracing, and no contraindication for tocolysis. Exclusion criteria included multiple pregnancy, nonreassuring FHR tracing, hypotension (blood pleasure <80/50 mmHg), unexplained vaginal bleeding, placenta previa, preterm premature rupture of membranes, chorioamnionitis, cervical cerclage during present gestation, urinary system infection, maternal systemic disease, fetal growth restriction, and sensitivity or contraindication to nitrates or magnesium sulfate.

Eligible women were then approached to participate in the trial, and after final recruitment, the study protocol was explained to the patients and informed consents were obtained. The patients were randomized into two treatment groups according to software-generated random allocation sequence. The random allocation sequence was held by only one author during the entire trial period. The tocolytic drug was changed in four patients from the $MgSO_4$ group and in three patients from GTN group, and these patients were excluded from the study in accordance with the study design (Figure 1). In conclusion, 19 patients in the $MgSO_4$ group and 22 patients in GTN group were included in the final analysis. All the groups were matched with regard to maternal age, gestational age, and parity.

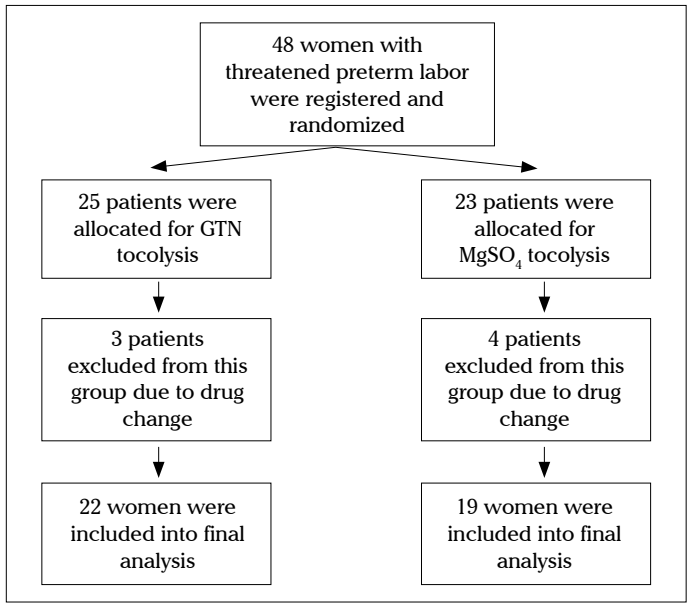

Figure 1. Patient randomization in the study

Table 1. Demographic characteristics of the study population

	$MgSO_4$	GTN	Control	p
Age⌘	25.53±4.94	24.04±4.65	25.09±3.44	0.555
Gravida*	2.0±1.71	1.0±1.33	1.0±1.53	0.712
Parity*	0.0±0.83	0.0±1.23	0.0±1.43	0.889
The number of living children*	0.0±0.83	0.0±0.73	0.0±0.53	0.691
Gestational age at diagnosis (weeks)⌘	31.4±3.0	32±2.0	31.6±3.0	0.731

⌘ Presented as mean±SD
* Presented as median±SD
GTN: glyceryl trinitrate; $MgSO_4$: magnesium sulfate

Study design

At the time of initial assessment, blood samples were collected for routine tests and serum nitrate and nitrite levels, following which maternal sedation with 10 mg intramuscular (IM) diazepam (Diazem®, Deva, Turkey) and hydration with 500 mL Ringer's lactate and with 500 mL 5% dextrose solution were performed. Betamethasone (Celestone Chronodose®, Schering Plough, Turkey) was administered at 12 mg IM every 24 hours for a total of two doses to all the patients for promoting fetal lung development. Patients could not be treated with sedation and hydration underwent $MgSO_4$ or GTN treatment.

$MgSO_4$ was performed; a loading dose of 6 g was given over 20 to 30 minutes and followed by an infusion of 3 g/hour. During tocolytic therapy, deep tendon reflexes, vital signs, fluid intake, and urinary output were measured hourly. Patients were followed with continuous fetal monitoring. Despite adequate blood levels of magnesium, if there was ongoing uterine activity, $MgSO_4$ tocolysis was changed to GTN tocolysis and those patients were excluded from the study. $MgSO_4$ treatment was continued for 12 hours after contractions had disappeared.

GTN patches 0.4 mg/h (Nitroderm® 10 transdermal therapeutic system (TTS), Novartis Pharma, Turkey) were applied to the skin of the patients' abdomen. After 1 hour from the application of the patches, if there was ongoing uterine activity, a second patch was applied. At 24 hours after the initiation of treatment, the patches were removed. At 3 hours from application, if no changes were demonstrated in the uterine activity, GTN tocolysis was changed to $MgSO_4$ tocolysis and those patients were excluded from the study. Maternal blood pressure was measured every 30 minutes for the first 3 hours and hourly thereafter after the placement of the patch. Side effects (e.g., hypotension, headache, dizziness, fatigue, tachycardia, facial flushing, itching) during the study period were recorded. Tocolytic treatment was stopped when patients experienced more severe adverse effects related to the tocolytic agent. Moderate headache was treated with paracetamol.

Bishop scores, total number of contractions in 10 minutes, the time interval between the initiation of the tocolytic treatment and resolving of uterine contractions, maternal side effect(s) of the tocolytic agent were compared between treatment groups. In addition, gestational age at delivery, mode of delivery, birth weights, Apgar scores, neonatal intensive care unit (NICU) admission, serum nitrate and nitrite levels, blood pressure, and pulse rate measurements were compared between all groups (treatment groups and controls).

Statistical analysis

All data collected were evaluated with Statistical Package for Social Sciences (SPSS, version 14, Chicago, Illinois, United States). For statistical analysis, Kruskal–Wallis, chi-square, and ANOVA tests were performed, and data were expressed as mean±SD or median±SD as appropriate. Statistical significance was defined as $p<0.05$.

Results

Demographic characteristics of the patients were similar in all the groups (Table 1). While pretreatment Bishop scores and total number of uterine contractions in 10 minutes were not

Table 2. Obstetric and perinatal data of patients

Data	$MgSO_4$	GTN	Control	p
Bishop score⌘	4.0±1.53	4.0±1.96		0.996
Total number of contractions in 10 minutes	4.13±1.06	4.54±1.22		0.584
The time interval between the initiation of the tocolytic agent and resolving of uterine contraction (hours)	6.83±3.47	3.66±1.28		0.002
Prolongation of gestation (days)	37.00±21.44	35.68±21.43		0.855
Gestational age at birth (weeks)	36.73±1.83	36.59±2.06	39.53±1.14	<0.01
Birth weight (g)	2810±540	2929±346	3312±333	0.01
Apgar score (1. minute)⌘	8.2±1.0	8.4±0.5	8.5±1.2	0.413
Cesarean delivery*	6 (40)	8 (36.4)	6 (28.6)	0.765
Neonatal intensive care unit admission*	2 (13.3)	1 (4.54)	0 (0)	0.210

Data is presented as mean±SD
⌘ Presented as median±SD
* Presented as number and (%)
GTN: glyceryl trinitrate; $MgSO_4$: magnesium sulfate

Table 3. Blood nitrate and nitrite levels in the treatment group before and after treatment

	$MgSO_4$	GTN	Control	p
Nitrate 1 (microM)[a]	21.32±5.15	25.71±19.47	32.10±9.94	0.067
Nitrate 2 (microM)[b]	17.77±3.88	22.70±7.43	32.10±9.94	<0.01
Nitrite 1 (microM)[c]	8.65±0.57	8.97±0.81	11.82±1.21	<0.01
Nitrite 2 (microM)[d]	11.66±1.39	11.20±1.35	11.82±1.21	0.259

[a]Nitrate 1: Pretreatment nitrate levels
[b]Nitrate 2: Nitrate levels after the treatment
[c]Nitrite 1: Pretreatment nitrite levels
[d]Nitrite 2: Nitrite levels after the treatment
(microMol=microM)
GTN: glyceryl trinitrate; $MgSO_4$: magnesium sulfate

significantly different between $MgSO_4$ and GTN groups, the time interval between the initiation of the tocolytic agent and resolving of uterine contractions was significantly shorter in GTN group (3.66±1.28 hours) than in the $MgSO_4$ group (6.83±3.47 hours). However, no significant difference was found between the treatment groups with regard to the overall prolongation of pregnancy, which is regarded as the determinant of success in the treatment of preterm delivery. This period was 37.00±21.44 days for $MgSO_4$ tocolysis and 35.68±21.43 days for GTN tocolysis (Table 2). Although there were no significant differences between $MgSO_4$ and GTN groups in terms of the gestational age at delivery (36.73±1.83 and 36.59±2.06, respectively) and birth weight (2810±540 and 2929±346, respectively), these parameters were significantly higher in the control group (Table 2). Apgar scores, cesarean delivery, and NICU admission rates were found to be similar between the treatment and control groups (Table 2).

Serum nitrate and nitrite levels before and after tocolytic treatment in the study and control groups are shown in Table 3. Serum nitrate and nitrite levels were significantly lower in the treatment groups than in the controls before tocolytic treatment. After tocolytic treatment, serum nitrate levels were found to be decreased in both $MgSO_4$ and GTN groups; however, this decrease did not reach statistical significance. Although serum nitrite levels were significantly increased after tocolytic treatment in $MgSO_4$ and GTN groups, no significant difference was found between the treatment and control groups in terms of serum nitrite levels after tocolytic therapy (Table 3). Blood pressure values after treatment were significantly lower in the treatment groups than in the control group; however, there was no statistically significant difference between $MgSO_4$ and GTN groups with respect to decreasing blood pressures after treatment. Although the mean pulse rate was found to be significantly increased after treatment in the treatment groups, the increase in the pulse rate was greater in GTN group than in the $MgSO_4$ group. Similarly, maternal side effects were significantly lower in the GTN group than in the $MgSO_4$ group (Table 4). Flushing was the most frequent side effect in the $MgSO_4$ group; however, it was not severe enough to require termination of treatment.

Discussion

The present study has demonstrated that GTN successfully stopped preterm uterine contractions in a shorter duration of time than $MgSO_4$ before 34 weeks' gestation and seemed to be

Table 4. Maternal adverse events recorded during the treatment

Adverse event*	$MgSO_4$	GTN
Headache	2 (13.3%)	3 (13.6%)
Palpitation	1 (6.6%)	2 (9.1%)
Dizziness	2 (13.3%)	-
Nausea	1 (6.6%)	-
Flushing	4 (26.6%)	-
Total	7 (66.4%)	5 (22.7%)

*Presented as number and percent
GTN: glyceryl trinitrate; $MgSO_4$: magnesium sulfate

more effective than $MgSO_4$ when patients had more frequent contractions and required emergency tocolysis. However, the overall gestation prolongation times were similar for both GTN and $MgSO_4$, and this denotes that both the agents have similar tocolytic activity. Lees et al. (14) demonstrated that pregnancy was prolonged up to 34 days in 13 patients treated with 10 mg GTN despite their relative small sample size. In another multicenter study, Lees et al. (19) compared the effect of ritodrine with that of GTN and demonstrated that the mean prolongation of gestation was 36.9 days for ritodrine and 35.8 days for GTN; however, this difference was not significant. These gestation prolongation times were consistent with our results; however, in a randomized, double-blind, placebo-controlled study, Smith et al. have found that GTN patches have prolonged pregnancy for 22 days (21). This difference may have resulted from different patient selection criteria.

NO, a free radical synthesized by a family of enzymes known as NOS, is an important physiological regulator of uterine contractility (22). NO inhibits uterine contractility by various mechanisms, including the reduction of intracellular calcium levels via protein kinase C, activation of calcium pumps, and suppression of the expression of gap junctions consisting of proteins called connexin 43 (Cx43), resulting in the facilitation of action potential propagation from one cell to another (23-25). Endogenous metabolism of NO gives rise to plasma and urinary nitrite (NO_2) and nitrate (NO_3). The serum levels of the NO metabolites reflect NO activity in human. Nitrite is a better indicator than nitrate. Therefore, the measurement of metabolites of NO, nitrite, and nitrate in plasma/urine/amniotic fluid/vaginal secretions could be used to evaluate NO activity in humans. The reduction of serum NO metabolites levels, particularly nitrite levels, in active spontaneous preterm labor and in the active phase of induced labor at term has been shown, and it is most likely to be an indicator of a downward regulation of NO production with the onset of labor (26). The results of our study have demonstrated that serum nitrate and nitrite levels before treatment were significantly lower in the treatment groups than in the controls and serum nitrite levels were significantly higher after tocolytic treatment. Similarly, higher serum nitrite levels have been shown in patients without labor than in those with preterm or term labor (26). It may suggest that the beneficial effect of $MgSO_4$ and GTN on the treatment of preterm labor depends on the increase in serum NO metabolite levels.

The present study indicated significantly lower blood pressures and higher pulse rates in treatment groups. However, these findings have improved in a few hours of treatment and were not severe enough to require the termination of treatment. A randomized, double-blind, placebo trial including 74 infants born to transdermal nitroglycerin-treated mothers has indicated that transdermal nitroglycerin may reduce neonatal morbidity and mortality as a result of decreased risk of birth before 28 weeks but can cause significantly more maternal side effects (27). However, according to our results, maternal side effects were found to be significantly lower in the GTN group. It may arise from their relatively larger sample size (n=74). Although there are several reports in the literature indicating a significant decrease in the blood pressure and increase in the pulse rate after GTN tocolysis, many reports have also indicated minor changes, which do not require any interventions, in the above-mentioned vital signs (28-31).

In conclusion, in the light of our results, GTN seems to be safe, well-tolerated, and as effective as several commonly used labor-delaying medications. In addition, it has less side effects. Therefore, it may be an appropriate alternative for the treatment of preterm labor.

The limitations of our study were the small sample size and short-term follow-up period. Further trials are required to clarify this subject.

Ethics Committee Approval: *Ethics committee approval was received for this study from the Local Institutional ethics committee of Ankara Etlik Zübeyde Hanım Training and Research Hospital.*

Informed Consent: *Written informed consent was obtained from patients who participated in this study.*

Peer-review: *Externallypeer-reviewed.*

Author Contributions: *Concept - Ş.Ç., M.A.N.; Design - Ş.Ç.; Supervision - S.D., H.D.; Resource - Ş.Ç., M.A.N., R.N.; Materials - Ş.Ç.; Data Collection and/or Processing - ŞÇ., M.A.N., R.N.; Analysis and/or Interpretation - Ş.Ç.; Literature Search - Ş.Ç., M.A.N.; Writing - Ş.Ç., M.A.N.; Critical Reviews - S.D., H.D., Ö.K.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Possible role of DaVinci Robot in uterine transplantation

Christos Iavazzo[1], Ioannis D. Gkegkes[2]

[1]Department of Gynecological Oncology, Christie Hospital, Manchester, United Kingdom

[2]Department of Surgery, General Hospital of Attica "KAT", Athens, Greece

Abstract

Minimally invasive surgery, specifically robotic surgery, became a common technique used by gynecological surgeons over the last decade. The realization of the first human uterine transplantation commenced new perspectives in the treatment of uterine agenesia or infertility in women with history of hysterectomy at a young age. Robot-assisted technique may enhance the safety of the procedure by facilitating the microvascular anastomosis, vaginal anastomosis, and ligaments' fixation. This study proposes the formation of a multicenter collaboration group to organize a protocol with the aim to clarify the possible role of robotic surgery in uterine transplantation. (J Turk Ger Gynecol Assoc 2015; 16: 179-80)

Keywords: Uterine transplantation, da Vinci® Robot, ethics, robotics

Received: 13 March, 2015 **Accepted:** 05 May, 2015 **Available Online Date:** 14 July, 2015

Introduction

The first human uterine transplantation was attempted in Saudi Arabia in 2002. However, necrosis of the graft occurred 99 days after surgery; thus, the attempt failed (1) that was followed by a lot of criticism. The second case was a 21-year-old patient with Mayer-Rokitansky-Kuster-Hauser syndrome in Turkey who achieved normal cycles and an implanted embryo post transplantation (2). Moreover, recently nine women in Sweden successfully received a transplanted uterus (3). The 6-month results of the first clinical uterus transplantation trial revealed that the durations of donor and recipient surgery ranged from 10 to 13 h and from 4 to 6 h, respectively. No immediate perioperative complications occurred in any of the recipients, and after 6 months, seven uteri remained viable with regular menses. Mild rejection episodes occurred in four of these patients that were effectively reversed by corticosteroids. The two losses of grafts were because of acute bilateral thrombotic uterine artery occlusions and persistent intrauterine infection (3). The indications of uterine transplantation include women with a history of hysterectomy at a young age for malignant uterine tumors or benign diseases, such as fibroids or adenomyosis; history of emergency peripartum hysterectomy; and history of congenital uterine infertility e.g., Mayer-Rokitansky-Kuster-Hauser syndrome (4).

Robotic surgery became a common technique used by gynecological surgeons over the last decade (5, 6). Three-dimensional view, improved dexterity, infiltration of a surgeon's natural tremor, and less operator fatigue are the main advantages of robot-assisted surgery (7, 8). In contrast, robotic surgery has some drawbacks, among which increased costs, requirement for a larger operating room because of the bulky machinery, and necessity of a specific training for the surgical team.

In the literature, only 12 cases of uterine transplantation have been described, all of which have been approached with the open technique (1-3, 9). The robot-assisted approach was never described or proposed in the field of uterus transplantation. Therefore, we suggest a new (robotic) approach in the already challenging uterine transplantation. The aim is to form a multicenter collaboration group to organize protocols in animal models as well as humans after ethical approval to clarify the possible role of da Vinci® Robot in uterine transplantation. Two different protocols are proposed: initially, one for animal models, such as sheep or non-human primates and the second one for humans after the possible success in the animal models. Specifically, the sheep and non-human models have been demonstrated to be superior models to that of the pig because the uterus has a relatively smaller size and the vasculature is of similar dimension as that of humans (10, 11). The lack of experience in the field and the small number of suitable candidates for the procedure renders the need of a multicenter approach essential.

The surgical technique should include the following steps:

- Hysterectomy of the donor uterus with preserved uterine vessels all the way to internal iliacs plus extended round and uterosacral ligaments.
- Ex vivo preparation of vessels.
- In lithotomy position, the laparoscope arm is introduced through a 12-mm transumbilical trocar with either an open technique or with a direct 4- puncture technique. In a 25°–

Address for Correspondence: *Christos Iavazzo, Department of Gynecological Oncology, Christie Hospital, Manchester, United Kingdom. Phone: +00447512131949 e.mail: christosiavazzo@hotmail.com*

DOI:10.5152/jtgga.2015.15045

30° Trandelenburg position, three 8-mm trocars are inserted under direct visualization at the left and right iliac fossae. A 10-mm trocar is positioned 2-cm cranial to the umbilicus and midway to the left trocar. An accessory 5- or 10-mm trocar can be placed midway and a 2-cm cranial to the umbilicus and right trocar in case of obese patient. In cases of patients with adhesions or large uteri, an extra 5- or 10-mm trocar may be positioned 10 cm lateral and caudal to the right 8-mm trocar. All trocars are separated by a distance of 8–10 cm to avoid instrument crowding.

- Entry of the graft through the vaginal wall.
- The vaginal wall of the excised uterus is anastomosed with the vaginal stump using the prosthetic valve-suturing technique used in cardiac valve replacement.
- Vascular anastomosis (internal iliac arteries of the donor uterus that are end-to-end anastomosed with that on the recipient as well as the uterine veins that are end-to-end anastomosed with internal iliac veins and proximal utero-ovarian veins).
- Fixation of ligaments.

The concept of uterus transplantation has already raised various ethical concerns (12). Organ transplantations are considered as life-saving operations or at least as an intervention that offer a significant improvement of a recipient's quality of life (13). Despite the fact that uterus transplantation does not offer health benefit for the recipient, the birth of a child may have an important impact on the quality of life of a woman, entering in this way in the definition and the scope of classic transplant. Moreover, the social acceptance of women with infertility depends on the cultural background of every society. In particular, in Islamic countries, the social respect for women is directly correlated with the childbearing ability of the woman. This particular cultural characteristic was probably the reason why the first uterus transplantation was performed in an Arab country (1). Nevertheless, uterus transplantation can be perceived as "reverse surrogacy," a form of surrogate motherhood where the received uterus takes the role of the surrogate in the recipient's body (13).

The main advantages of such a protocol would be the possible easier technique of micro-vascular anastomosis, three-dimensional (3D) view, wrist-like motion of the robotic arms, possible lower blood loss, possible fewer wound complications, reduced length of hospital stay, and faster return to normal activities (14). However, some could argue against such a technique by highlighting the disadvantages and possible limitations; for example, the decision regarding how the donor uterus is going to be inserted in the abdominal cavity, the fact that there is no previous experience, and the continuous argument of ethical concerns regarding uterine transplantation. Therefore, animal studies are initially suggested.

It is necessary for an experienced multidisciplinary transplantation team to extensively evaluate the recipient and donor and to obtain informed consent after discussing the major risks related to surgery, immunosuppression, and possible future pregnancy. Candidates for this operation should be carefully selected. To achieve the optimal possible results, a multispecialty approach is suggested, including careful assessment of the patient by an obstetrician, a gynecologist who is well-trained in both robotic gynecologic surgery and uterine transplantation, a vascular surgeon, an anesthetist, and a psychologist.

Conclusion

We believe that the use of a robot-assisted technique may enhance the safety of the procedure by facilitating the microvascular anastomosis, vaginal anastomosis, and ligaments fixation. Reduction of the parietal trauma to a minimum, results in a cosmetic and functional outcome that is likely to be superior to that of open laparoscopic techniques. Future studies will be necessary to confirm the long-term safety of such protocols.

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - C.I.; Design - C.I., I.D.G.; Supervision - C.I., Resource - C.I., I.D.G.; Materials - C.I., I.D.G.; Data Collection and/or Processing - I.D.G.; Analysis and/or Interpretation - C.I., I.D.G.; Literature Search - I.D.G; Writing - C.I., I.D.G.; Critical Reviews - C.I., I.D.G.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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This article will be credited by TMA within the scope of CME/CPD.

Parasitic myoma after laparoscopic surgery: a mini-review

Hakan Erenel, Osman Temizkan, Begüm Aydoğan Mathyk, Suat Karataş

Clinic of Obstetrics and Gynecology, Şişli Hamidiye Etfal Training and Research Hospital, İstanbul, Turkey

Abstract

The aim of this review is to summarize the cases of parasitic myomas after laparoscopic surgery. A literature search was performed using the PubMed database for the period of January 1997 to December 2014. We used the following keywords: "laparoscopic hysterectomy," "laparoscopic myomectomy," "morcellation," "parasitic fibroids," "parasitic myomas," and "leiomyomatosis." A total of 29 articles meeting the selection criteria were included in our review, describing 53 patients who underwent surgery for parasitic myomas. Parasitic myoma is a rare condition resulting from the small fibroid fragments left after morcellation and can be either asymptomatic or symptomatic. Although it is rare, patients should be informed about the risk of this condition after laparoscopic surgery. It is important for surgeons to look for small fibroid fragments during and after morcellation and make an effort to remove every piece of tissue. (J Turk Ger Gynecol Assoc 2015; 16: 181-6)

Keywords: Laparoscopic hysterectomy, laparoscopic myomectomy, morcellation, parasitic fibroids, parasitic myomas

Received: 18 January, 2015 **Accepted:** 29 April, 2015 **Available Online Date:** 14 July, 2015

Parasitic myoma is a term used to describe a myoma of extrauterine nourishing. Although uterine myomas are the most common female tumors, parasitic myomas are rare pathologic structures of uncertain etiology. One theory suggests that pedunculated subserosal myomas become separated from the uterus and receive blood supply from other adjacent organs, such as the bowel, peritoneum, omentum, or mesentery (1). Peritoneal metaplasia is another theory that describes the pathogenesis of myomas in unexpected fields of abdomen. The development of multiple nodules on peritoneal surfaces is referred to as leiomyomatosis peritonealis disseminata (LPD), which was first described in 1952 by Wilson et al. (2). Different pathological mechanisms related to hormonal factors, genetic basis, pregnancy, oral contraceptive pills, and prior surgery have been described in the literature. Estrogen exposure can stimulate metaplasia and differentiation of subperitoneal mesenchymal stem cells to smooth muscle cells (3). LPD is usually considered as a premenopausal benign condition; however, malignant transformation and postmenopausal status have also been observed in exceptional cases (4, 5). A recent report showed that currently, there are approximately 200 cases of LPD (6). In the last decade, there have been increasing reports of parasitic myomas after laparoscopic surgery, which have been newly classified as iatrogenic parasitic myomas (7). These myomas are related to the small fibroid fragments left after morcellation that could have detached from the uterus and developed blood supply from adjacent organs. In this paper, we aimed to summarize and discuss the various reports of parasitic myomas after laparoscopic uterine surgery.

This systematic review was conducted in accordance with the PRISMA guidelines. Literature search was performed using the PubMed database for the period of January 1997 to December 2014. We used following keywords: "laparoscopic hysterectomy," "laparoscopic myomectomy," "morcellation," "parasitic fibroids," "parasitic myomas," and "leiomyomatosis." Specifically, reports written in English language and in which patients with parasitic myoma underwent laparoscopic uterine surgery were considered eligible for our review. Articles including patients who underwent laparotomy or vaginal surgery or who were operated on account of retained myoma in the initial surgery were excluded. Reports with malignant pathology results were also excluded from our review. The flow chart for the study selection process is shown in Figure 1. From the selected articles, the number, size, receptor status, location of parasitic myomas, usage of morcellator in previous surgery, and type of previous laparoscopic uterine surgery were determined.

After the initial literature search, 36 articles were identified for review. However, after screening the language, 2 reports were excluded because they were not written in English. Of the remaining 34 reports, 5 did not meet the inclusion criteria and were thus excluded (4 reports involved previous laparotomy and 1 involved retained myoma in an initial surgery). Consequently, 29 reports were finally included in our review, describing 53 patients who underwent surgery for parasitic myomas. The average age of the patients at diagnosis was 40 years (range: 24–57 years). Of the total patients selected, 31 (59%) had undergone laparoscopic myomectomy, 12 (23%)

Address for Correspondence: *Hakan Erenel, Şişli Hamidiye Etfal Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, İstanbul, Türkiye. Phone: +90 506 309 29 95 e.mail: hakanerenel@yahoo.com*

DOI:10.5152/jtgga.2015.15242

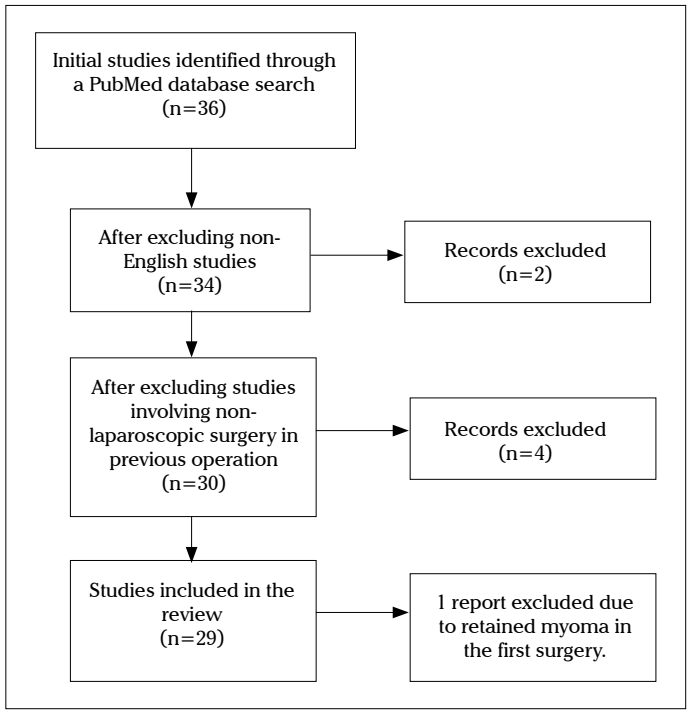

Figure 1. Flow chart of the literature search

had undergone laparoscopic subtotal hysterectomy, 6 (11%) had undergone total laparoscopic hysterectomy, 3 (6%) had undergone laparoscopic-assisted myomectomy, and 1 had undergone laparoscopic endometriosis surgery. In addition, 28 of the 53 patients (53%) had complained of abdominal pain; however, 13 of 53 patients (25%) were asymptomatic. The average time between the initial laparoscopic uterine surgery and the onset of symptoms related to parasitic myomas was 57 months (range:2–192 months). In the selected studies, parasitic myomas were most commonly found in the colon serosa and pouch of Douglas. The largest observed myoma was sized 30 cm and was attached to the omentum. Because we excluded malignant cases, all the cases reported in this review refer to a benign pathology. The list of all studies considered in this review is provided in Table 1.

In 1909, parasitic myomas were first described as rare pathologic structures believed to be pedunculated subserosal myomas that twist from the uterine pedicle and survive by neovascularization of adjacent organs such as the omentum and mesenteric vessels (1, 8). The first report describing parasitic myomas after laparoscopic surgery was published in 1997 (9). Morcellation was not performed in this case and the parasitic myoma was located near the trocar sleeve and had grown into the abdominal wall. Parasitic myomas can be found in variable locations. They are commonly reported in the pelvic region; however, Sinha et al. (10) have reported a case of parasitic myoma under the diaphragm. The degree of Trendelenburg position may be related to the location of parasitic myomas. Thus, we propose that the International Federation of Gynecology and Obstetrics (FIGO) classification system for uterine myomas and parasitic myomas should classify parasitic myomas on the basis of their locations in the mesentery, omentum, bowel wall, or peritoneum.

A retrospective study has shown a prevalence of 0.9% for parasitic myomas after laparoscopic surgery using morcellation (11). Because the symptoms of parasitic myomas are not specific, the number of case reports with asymptomatic presentation should not be underestimated (12-16). In our review, 13 of 53 patients (25%) were asymptomatic. Small and asymptomatic parasitic myomas can be overlooked at follow-up.

Our review also consisted of reports on pelvic adenomyotic masses after laparoscopic subtotal hysterectomies in the literature (17, 18). Morcellation of the uterus rather than that of the myoma could be associated with adenomyotic masses. Other issues related to uterine morcellation include the dissemination of occult malignancies including uterine sarcoma and its possible negative effect on patient prognosis. Morcellation within a surgical bag can be a safe option to prevent dissemination of undetected uterine malignancies (19) and can also prevent the scattering of small myoma fragments, which is probably the most important risk factor for iatrogenic parasitic myomas.

The literature shows variable intervals between the first surgery and the diagnosis of parasitic myomas, ranging from 2 to 192 months. Circulating hormone levels and the receptor status can affect the onset of clinical symptoms and potential growth patterns. Our literature review indicates that different descriptions are used for the pathogenesis of parasitic myomas, including disseminated peritoneal leiomyomatosis, parasitic peritoneal leiomyomatosis, multiple ectopic myomas, and peritoneal leiomyoma (12, 20-22). Disseminated peritoneal leiomyomatosis is a rare spontaneous condition that should be differentiated from iatrogenic parasitic myomas (23). Thus, we recommend the establishment of a nomenclature to eliminate the pathogenic diversity of parasitic myomas in the literature.

With advances in gynecologic laparoscopic surgery, iatrogenic parasitic myomas after laparoscopic uterine surgery became a new issue. In our review, 48 of 53 patients were reported between 2007 and 2014. Most of these cases involved a history of morcellation. Morcellation of myomas during myomectomy and morcellation of the uterus during hysterectomy appear to be risk factors for iatrogenic parasitic myomas. LaCoursiere et al. (24) reported a case of retained fragments after laparoscopic total hysterectomy, which showed endocervical fragments in the cul de sac.

In our review, 25% of patients were asymptomatic, which can be related to the size and location of parasitic myomas. On the other hand, a review of the literature showed different sizes of myomas that were located on the bowel wall. Further studies should demonstrate the necessity of surgery for the treatment of asymptomatic small parasitic myomas because these myomas can attach very firmly to the bowel or mesentery. Leren et al. (25) have reported a case of intestinal perforation during surgery for parasitic myomas measuring 5 cm. Aust et al. (26) have reported a case of parasitic myoma resembling ovarian malignancy in which surgery was performed by a gynecologic oncologist. Extensive and complicated surgery may be required for parasitic myomas. Patients should be informed about this extensive surgery. The pararectal fossa, abdominal wall trocar site, omentum, appendix, paravesical space, gastric serosa, intestinal serosa, subcutaneous tissue, lumbar region, rectus

Table 1. Literature search of articles about parasitic myomas after laparoscopic surgery

First author, Year	No of patients	Symptoms	Age of patient	Previous surgery	Morcellator use	Months since first surgery	Location	No of parasitic myomas (largest diameter)	Histo pathology Receptor	Other findings
Ostrzenski et al. (9) 1997	1	Palpable mass	43	LM	No	2	Abdominal rectus muscle	1 10 mm	Leiomyoma ?	Mass had grown to 2.5×2 cm during medical treatment
LaCoursiere et al. (24), 2005	1	Pain, dyspareunia	36	TLH	Yes	10	Pelvic sidewall, bowel serosa, cul de sac	4 (4 mm, 5 mm, 7 mm, 7 mm)	Leiomyoma ?	Cul de sac lesions were cervical and endocervical tissues
Hilger et al. (17), 2006	1	Pain	44	LASH	Yes	12	Right ovary, cervical stump, rectovaginal septum	3 (40 mm, 40 mm, 30 mm)	Adenomyosis ?	
Paul et al. (12), 2006	1	Asymptomatic	28	LM	Yes	30	Port site peritoneum, right paracolic gutter	3 -	Leiomyoma ?	
Donnez et al. (27), 2006	1	Pain, dyspareunia	53	LASH	Yes	60	Pelvic mass in the pararectal fossa	1 40 mm	Adenomyosis	
Donnez et al. (18), 2007	8	Pain, dyspareunia	? (40–48)	LASH	Yes	? (24–108)	Pelvis, cervical stump	? 45 mm (20–80 mm)	Adenomyosis ?	Estrogen alone was given as hormone replacement therapy to 5 patients who had undergone bilateral ophorectomy
Sinha et al. (10), 2007	2	Pain, mass palpable	41, 48	LM, TLH LM, LASH	Yes	36, 96	Sigmoid colon serosa, lateral pelvic wall, pouch of Douglas under the dome of the diaphragm	3, 1 (150, 80, 70 –100 mm)	Leiomyoma PgR+ ER+	
Takeda et al. (13), 2007	1	Asymptomatic	39	Gasless LM	Yes	72	Omentum, round ligament, pelvic peritoneum, vesicouterine, and peritoneum of Douglas pouch	Multiple (10–60 mm)	Leiomyoma PgR+ ER−	
Kumar et al. (20), 2008	1	Abdominal distension, breathlessness	24	LM	Yes	9	Attached to the omentum and descending colon	6 (30–300mm)	Leiomyoma ?	Reported as disseminated peritoneal leiomyomatosis, preoperative GnRH injection relieved breathlessness
Moon et al. (28), 2008	1	Palpable mass	34	LM	Yes	36	Abdominal wall trocar site	1 32 mm	Leiomyoma ?	
Epstein et al. (29), 2009	1	Pelvic pain on pressure	30	LM	Yes	18	Omentum, sigmoid colon	2 (30 mm, 80 mm)	Leiomyoma ?	
Kho et al. (30), 2009	7	Pain (5), dyspareunia, menorrhagia	39 (32–50)	LM (6) Laparoscopic endometriosis surgery	Yes	75 (2–204)	Bowel mesentery (4), appendix, paravesical space, pararectal space, inguinal canal, rectovaginal septum, bladder wall	?	Leiomyoma ?	
Miyake et al. (31), 2009	1	Asymptomatic	36	LM (2)	Yes	72	In the peritoneal cavity at multiple sites including the gastric serosa, intestinal serosa, omentum, and cul de sac	Multiple (10–180 mm)	Leiomyoma ?	Biopsy of the gastric submucosa via endoscopy showed a smooth muscle tumor that did not originate from the gastrointestinal system
Thian et al. (32), 2009	1	Asymptomatic	35	LM	Yes	29	Pouch of Douglas, subcutaneous nodule in the anterior abdominal wall	Multiple (>50) (20–135 mm)	Leiomyoma ?	Reported as leiomyomatosis peritonealis disseminata

Table 1. Continued

Sinha et al. (33), 2009	1	Pain	42	LM	Yes	36	Pouch of Douglas, right lumbar region	2 (70 mm, 60 mm)	Leiomyoma ?	
Wada-Hiraike et al. (34), 2009	1	Palpable mass	31	LAM	No	48	Abdominal rectus muscle	1 87 mm	Leiomyoma ?	Grown to 105 mm after 6 months
Pezzuto et al. (22) 2010	1	Metrorrhagia	45	LM	Yes	144	Pedunculated to the perirectal peritoneum	2 (30 mm, 50 mm)	Leiomyoma ?	Reported as peritoneal leiomyomas
Larrain et al. (14), 2010	4	Asmyptomatic, pain (2), genital bulge	49 (39–57)	LM (2) TLH (2)	Yes	99 (36–192)	Pouch of Douglas (2), presacral peritoneum, anterior vaginal wall	1 60 mm (50–70 mm)	Leiomyoma, adenomyosis ?	
Ordulu et al. (35), 2010	1	Asymptomatic	48	LASH	Yes	84	Small bowel, abdomen, pelvis	16 (6–90 mm)	Leiomyoma	Reported as disseminated peritoneal leiomyomatosis
Aust et al. (26) 2011	1	Pain	41	TLH	?	36	Rectosigmoid colon, descending colon	2 (130 mm, 70 mm)	Adenomyoma ?	Surgery performed by a gynecologic oncologist
Cucinella et al. (11), 2011	4	Asymptomatic (2), palpable mass, and pain	40 (35–48)	LM	Yes	69 (24–108)	Pelvic parietal peritoneum, anterior parietal peritoneum, GI tract, left paracolic fossa	3 (1–5) 29 mm (4–60 mm)	Leiomyoma ?	
Sesti et al. (21), 2012	1	Palpable masses	41	Gasless LM	No	120	Abdominal rectus muscle	6 (5–38 mm)	Leiomyoma ?	Reported as multiple ectopic leiomyomas
Takeda et al. (15), 2012	1	Asymptomatic	29	Gasless LAM	Yes	24	Retrovesical peritoneum	1 14 mm	Leiomyoma PgR+ ER−	After 2 years of spontaneous-conception, 7-cm mass at 35 weeks, excised at CS
Leren et al. (25), 2012	3	Pain (2), asymptomatic	48 (46–50)	LM	Yes	61 (42–96)	Peritoneum, abdominal wall, colon transversum, cecum, pelvic abdominal wall, rectum, cervix, and small intestine	5 (1–12) 25 mm (10–50 mm)	Leiomyoma, adenomyoma ?	Intestinal perforation in 1 case
Takeda et al. (16), 2013	1	Asymptomatic	31	LAM	Yes	84	Anterior parietal peritoneum, pouch of Douglas, omentum	Multiple ?	Leiomyoma PgR+ ER+	Case with MEN 1 syndrome and situs inversus totalis
Temizkan et al. (36), 2014	1	Abdominal pain, constipation, dyspareunia, and dysmenorrhea	35	LM	Yes	48	Colon serosa, mesentery, pouch of Douglas, bladder	5 (30–70 mm)	Leiomyoma PgR+ ER+	
Huang et al. (37), 2014	1	Asymptomatic	34	LM	Yes	84	Small intestine serosa, left tube	2 (60 mm, 20 mm)	Leiomyoma ?	
Yi et al. (38), 2014	3	Asymptomatic, pain (2)	42 (36–46)	LASH LM, TLH	?	36 (24–60)	Pouch of Douglas, trocar incision site, uterosacral ligament	1 (25 mm, 40 mm, 50 mm)	Leiomyoma ?	
Ramesh et al. (39), 2014	1	Pain	48	TLH	Yes	3	Oblique abdominal muscles	1 60 mm	Leiomyoma ?	

LAM: laparoscopic-assisted myomectomy; LASH: laparoscopic subtotal (supracervical) hysterectomy; LM: laparoscopic myomectomy; TLH: total laparoscopic hysterectomy; PgR: progesterone receptor; ER: estrogen receptor; CS: Cesarean section; GnRH: gonadotropin-releasing hormone; MEN 1: Multiple endocrine neoplasia type 1

muscle, bowel mesentery, and uterine tube are other locations for parasitic myomas (27-39). In the case by Kumar et al. (20) preoperative gonadotropin-releasing hormone (GnRH) injection relieved breathlessness; however, it was not effective in reducing the size of the mass significantly. Medical treatment of parasitic myomas located on the bowel wall or mesentery and the clinical course of asymptomatic small parasitic myomas should be analyzed in further studies.

The receptor status was not available in most reports. Given that the receptor status and hormone levels can affect the clinical course, further studies are needed to investigate the importance of the receptor status and hormones.

Conclusion

Fibroid remnants after laparoscopic myomectomy/hysterectomy are risk factors for the growth of fibroid tissue in the peritoneal cavity with unexpected localizations. Despite its rarity, patients should be informed about this risk. It is important for surgeons to look for small fibroid fragments during and after morcellation and accordingly make efforts to remove every piece of tissue. Furthermore, of the different types of morcellators available, it is important to select the one that provides less tissue scattering. Moreover, at the end of surgery, the pelvis should be irrigated in the reverse Trendelenburg position and surgeons should be aware of the late-onset symptoms of the disease.

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - H.E., O.T., B.A.M., S.K.; Design - B.A.M., S.K.; Supervision - H.E., O.T.; Resource - H.E., B.A.M., S.K.; Materials - H.E., B.A.M., S.K.; Data Collection and/or Processing H.E., B.A.M., S.K.; Analysis and/or Interpretation - H.E., O.T.; Literature Search - H.E., B.A.M., S.K.; Writing - H.E., B.A.M.; Critical Reviews - H.E., O.T., B.A.M.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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G-spot augmentation with autologous fat transplantation

Christian Herold[1], Melodi Motamedi[1], Uwe Hartmann[2], Sixtus Allert[1]

[1]Department of Plastic and Aesthetic Surgery, Sana Klinikum Hameln Pyrmont, Hameln, Germany

[2]Department of Psychiatry, Social Psychiatry, and Psychotherapy, Division of Psychology, Hannover Medical School, Hannover, Germany

Abstract

Lipofilling for G-spot augmentation is appealing because long-term persistence of the fat is expected to be very good. We report the case of a 29-year-old patient who requested G-spot augmentation to enhance sexual sensation. Autologous fat (8 cc) that was harvested from the trochanteric area was injected. Although there are few published data acknowledging the presence of the G-spot, the patient was satisfied with the procedure and no side effects occurred. Nevertheless, evaluation with standard questionnaires, such as Fragebogen zur Lebenszufriedenheit (FLZ) and Kurzfragebogen für sexuelle Probleme (KFSP-F), did not indicate the positive effects on subjective well-being and sexual parameters of a surgical G-spot augmentation. Studies comprising a larger series of patients are required before substantiated recommendations regarding the benefits and risks of this procedure will be possible. (J Turk Ger Gynecol Assoc 2015; 16: 187-8)

Keywords: G-spot, fat transplantation, FLZ, KFSP-F, questionnaire

Received: 06 February, 2015 **Accepted:** 20 May, 2015 **Available Online Date:** 14 July, 2015

Introduction

The G-spot had been described more than 60 years ago by the German gynecologist Gräfenberg (1). This area on the anterior wall of the vagina is 10–20 mm in diameter and is said to be approximately 5 cm above the ostium of the urethra. In some women, this area is highly sensitive and stimulation may quickly lead to orgasm (2). Although anatomical and biochemical studies have failed to provide evidence regarding the G-spot and only case studies and anecdotal observations support its presence (3), the demand for surgical G-spot augmentation is increasing. Hyaluronic acid or autologous fat are the described fillers for this procedure (4).

Case Presentation

We report the case of a 29-year-old patient who requested G-spot augmentation to enhance sexual sensation. This patient also consulted our clinic for augmentation/mastopexy and thigh lift as well as for liposuction of the trochanteric region. Therefore, it was decided to use autologous fat in this patient. After informed consent was obtained from the patient, she was administered general anesthesia and was operated in the supine position with straddled legs. Fat graft was harvested by the water-assisted liposuction technique (Body Jet® and LipoCollector 3® System, Human Med, Schwerin, Germany). The urethra was secured with a catheter that also stabilized the anterior vaginal wall and made the injection technique simpler. After insertion of a speculum, an injection of 8-cc fat graft (Figure 1) was administered strictly in the submucosal layer 5 cm away from the introitus of the urethra, taking care not to injure the urethra and bladder and not to perforate the vaginal wall a second time because this would result in the fat graft leaking from the injection site. A 18-G sharp needle (BD, Franklin Lakes, NJ, USA) and a 5-cc syringe (BD, Franklin Lakes, NJ, USA) were used. No sutures or dressings were used, and the patient was recommended not to have sexual intercourse for 1 week following the surgery. The postoperative course was uneventful, and the patient did not report any pain at the injection site.

Postoperatively, the patient presented to our clinic for follow-up and reported an initial increased ability to stimulate the amplified G-spot during the first 2 weeks that normalized after the first 2 weeks. The patient was asked to complete the Fragebogen zur Lebenszufriedenheit (FLZ) questionnaire, a standard tool for the evaluation of satisfaction and happiness in life, 1 and 20 months postoperatively. The item Spouse/Partner was rated preoperatively and one month postoperatively as “very happy,” stanine 9, meaning within the highest 4% of the representative sample for normative comparison, and stanine 5, meaning average satisfaction after 20 months. The item Sexuality was rated preoperatively and postoperatively at all time points as “rather unhappy,” stanine 3, meaning within the lowest 23% of the representative sample for normative comparison. The item Self was rated preoperatively and postoperatively after one month “rather unhappy,” stanine 3, meaning within the lowest 23% of the representative sample for normative comparison, but stanine 5, meaning average satisfaction after 20 months.

Address for Correspondence: *Christian Herold, Department of Plastic and Aesthetic Surgery, Sana Klinikum Hameln Pyrmont, Hameln, Germany. Phone: +49 5151 97 1245 e.mail: christianherold@gmx.de*

DOI:10.5152/jtgga.2015.15027

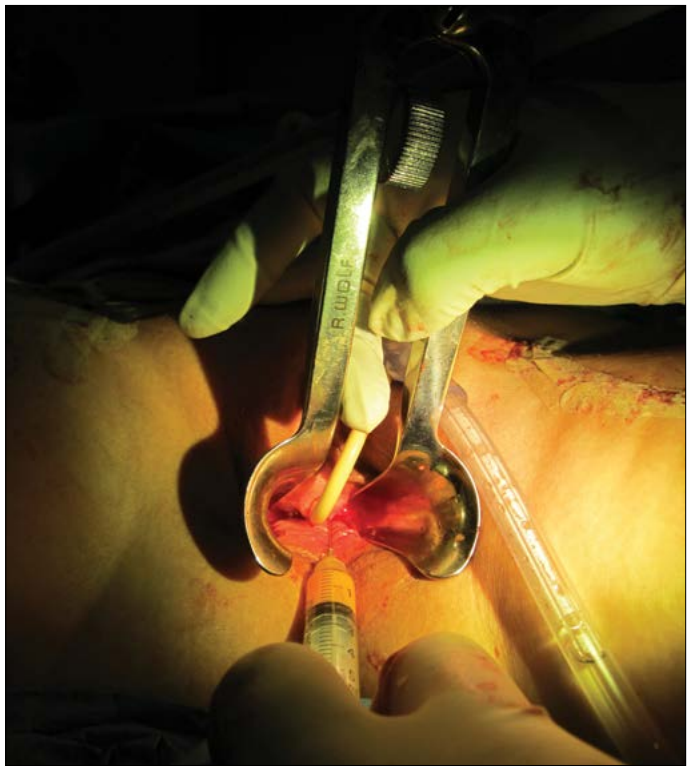

Figure 1. After insertion of a speculum, a strict submucosal injection of 8-cc fat graft was administered using a 18-G needle and a 5-cc syringe in the area of the G-spot 5 cm away from the introitus of the urethra, taking care not to injure the urethra and bladder

The Kurzfragebogen für sexuelle Probleme (KFSP-F) questionnaire is a German adaptation of the brief index of sexual functioning for women (5). This 28-item questionnaire was employed to assess problems in five major dimensions of female sexuality (desire, arousal, orgasm, sexual pain, and sexual satisfaction). KFSP-F as well as FLT questionnaires have been validated for people living in Germany. Nevertheless, they have not been explicitly validated for Turkish women. KFSP-F was applied preoperatively and postoperatively. Postoperatively at both time points, the patient reported a greater importance of a satisfying sexual life and a stronger sexual desire as well as a higher willingness to initiate sexual activity. Nevertheless, she was not able to reach orgasm during vaginal sexual intercourse neither before nor after G-spot amplification. At all time points, auto stimulation was the only way for the patient to reach orgasm.

Discussion

The evidence to support the presence of the G-spot is weak (3). Published scientific data highlight the fact that the G-spot does not even exist. In a recent review, Puppo et al. (6) proposed that G-spot amplification is an unnecessary and inefficacious procedure. Nevertheless, introital injections of hyaluronic acid have been able to increase sexual satisfaction (4, 7). It is unclear whether these finding are based on the anatomical changes or rather based on imagination of the patients treated. Autologous fat transplantation has also been used to amplify the G-spot area. In a book article, Gress (4) describes an amelioration of sexual stimulation after autologous fat transplantation in 52% of his patients. In these patients, 5–12-cc fat graft had been injected. Lipofilling to amplify the G-spot area is appealing because long-term persistence of the fat is expected to be very good. Exact volumetric measurements are missing; however, because of the very good vascularity of the vaginal mucosa, volume survival rates should be superior to the breast tissue, where survival rates of >70% have been demonstrated using magnetic resonance imaging volumetry (8).

Despite all positive preliminary results (4), patients seeking G-spot augmentation should be thoroughly informed as dyspareunia, infection, or scarring are possible complications (9).

To the best of our knowledge, the effect of G-spot amplification has not been previously investigated by applying standard questionnaires. The results of this case report did not indicate positive effects on subjective well-being and sexual parameters of a surgical G-spot augmentation. A larger series of patients is required before substantiated recommendations regarding the possible benefits and risks of this procedure will be possible; the scientific evaluation of the presented case at least fails to prove any efficiency.

Ethics Committee Approval: *N/A.*

Informed Consent: *Written informed consent was obtained from patient who participated in this case.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - C.H., M.M., S.A.; Design - C.H., S.A.; Supervision - S.A., U.H.; Resource - S.A.; Materials - M.M., C.H., S.A., U.H.; Data Collection and/or Processing - M.M., C.H., S.A., U.H.; Analysis and/or Interpretation - M.M., C.H., S.A., U.H.; Literature Search - M.M., C.H., U.H.; Writing - M.M., C.H. S.A., U.H.; Critical Reviews - M.M., C.H., S.A., U.H.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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Vaginal angiomatosis: differential diagnosis of a rare case

Flavio Grauso[1], Giancarlo Balbi[1], Maria Luisa D'Aponte[2], Andrea Ronchi[3], Roberto Russo[3], Francesca Falcone[1], Enrico Michelino Messalli[1]

[1]Department of Woman, Child and General and Specialized Surgery, Second University of Naples, Naples, Italy

[2]Department of Surgical Pathology, ASL NA1, Naples, Italy

[3]Department of Anatomic Pathology and Cytopathology, University of Naples "Federico II", Naples, Italy

Abstract

Vaginal angiomatosis is regarded as part of a very rare entity of benign vascular tumors of the female genital tract. The incidence of these tumors is extremely low. The rarity of this disease and lack of distinctive features poses a problem of differential diagnosis. We present the case of a 51-year-old female with grade III uterine prolapse and a bleeding vaginal wall mass. Violaceous irregular soft tissue with hemorrhagic spots was observed in the lower third of the posterior vaginal wall. The patient underwent surgery for colpohysterectomy with vaginal wall mass excision. Surgical excision was curative, and no recurrences were observed after 12 months of follow-up. The aim of our study is to present a rare but representative case. This will hopefully increase the level of awareness regarding this condition so that physicans will keep it in mind during differential diagnosis of similar clinical cases. Furthermore, it highlights the important role of pathological examination for the definitive diagnosis of angiomatosis. (J Turk Ger Gynecol Assoc 2015; 16: 189-91)

Keywords: Angiomatosis, vagina, hemangioma tumor

Received: 09 February, 2015 **Accepted:** 13 May, 2015 **Available Online Date:** 14 July, 2015

Introduction

Vaginal angiomatosis is considered as a very rare entity of benign vascular tumors of the female genital tract. The incidence of these tumors is extremely low and this percentage is further reduced if we take into account only vaginal angiomatosis. The rarity of this disease and lack of distinctive features poses a problem of differential diagnosis. Benign vascular lesions of the female genital tract are localized more frequently in the ovary followed by the vulva and more rarely in the cervix and vagina (1). Symptoms depend on the size, location, and histological type of the lesion. Small benign vascular lesions can be asymptomatic, whereas more extensive lesions may be associated with important clinical manifestations such as abnormal vaginal bleeding, infertility, spontaneous abortions, and fetal loss. Benign vascular lesions of the female genital tract can rapidly grow during pregnancy; therefore, they may cause important complications (2), and pregnant women with genital angiomatosis may require cesarean section (3). The histological type of the lesion may affect the onset of symptoms because bleeding from arteriovenous malformation can be more intense and difficult to control (4). Color Doppler ultrasound examination is often able to add useful features to diagnosis (4). Benign vascular lesions of the female genital tract may occur as isolated lesions or coexist with other hemangiomas involving the skin or other organs or can be part of a complex syndrome such as Klippel–Trénaunay–Weber syndrome (4), tuberous sclerosis, hereditary hemorrhagic telangiectasia, and blue rubber bleb nevus syndrome. Vaginal angiomas are classified on the basis of histological appearance as capillary, cavernous venous, or arteriovenous (5). The aim of our study is to present a rare but representative case. This will hopefully increase the level of awareness regarding this condition so that physicans will keep it in mind in the differential diagnosis of similar clinical cases.

Case Presentation

We present the case of a 51-year-old female with grade III uterine prolapse and a bleeding vaginal wall mass. The patient reported symptoms, such as difficulty in evacuation caused by the uterine prolapse and vaginal bleeding caused by ulcerated posterior vaginal wall mass. The patient history had no specific feature associated with angiomatosis, and all laboratory parameters are within the normal range. She had two spontaneous vaginal delivery without episiotomy or lacerations. Our patient had no history of neoplasia or other diseases, such as hypertension, chronic venous insufficiency, or acquired immune deficiency syndrome. The physical examination revealed grade III uterine prolapse with an increased volume of uterus, a hypertrophic elongated cervix, and bilateral labial hypertrophy. Violaceous irregular soft tissue is present in the lower third of vaginal wall (Figure 1). The lesion had

Address for Correspondence: *Enrico Michelino Messalli, Department of Woman, Child and General and Specialized Surgery, Second University of Naples, Naples, Italy. Phone: +390815665601 e.mail: emessalli@alice.it*

DOI:10.5152/jtgga.2015.15018

a maximum longitudinal diameter of 20 mm with hemorrhagic spots in the posterior vaginal wall. Ultrasound examination confirmed the findings of the physical examination. Color Doppler ultrasound examination of the pelvic region revealed high-grade pelvic venous varicosity without arteriovenous shunts or vascular malformations. The patient underwent surgery for colpohysterectomy with vaginal wall mass excision, left salpingo-oophorectomy (because of the presence of a benign ovarian cyst), and vaginoplasty. Microscopic examination was performed on paraffin-embedded sections that were stained with hematoxylin and eosin (H&E) (Bio-Optica, Milano, Italy). The histopathological examination revealed marked acanthosis and hyperkeratosis of the cervical and vaginal epithelium that were related to uterine prolapse. In addition, histological examination of both the anterior and posterior vaginal walls demonstrated diffuse fibrosis of the sub epithelial connective tissue containing numerous vascular elements lined by flattened endothelium. These predominantly included not only venous vessels with irregularly dilated lumens with occasional herniations forming vascular lacunae but also vessels of arterial and capillary type (Figure 2). The former had thick walls, including smooth muscle cells; the latter appeared to form foci of proliferation that were clustered adjacent or in the thickness of the wall of some venous lacunae or within an organized thrombus (Figure 3). Some venous lumens demonstrated intravascular papillary proliferation of the endothelium. Endothelial cells revealed no nuclear atypia or mitotic figures. Immunohistochemistry was performed on formalin-fixed paraffin-embedded tissue block with a panel of monoclonal antibodies against different antigens (Bio-Optica, Milano, Italy). Staining for immunohistochemical endothelial markers cluster of differentiation 34 (CD34) and Wilms' tumor 1 (WT1) highlighted the increased vascular density and confirmed the endothelial nature of the almost solid clusters of capillaries. The muscular wall of the arterial vessels was positive after staining for smooth muscle actin and desmin. Staining for proliferation marker Ki67 revealed focal positivity in the basal layer of the vaginal epithelium; however, no positivity was detected in endothelial cells. These morphological and immunohistochemical characteristics enabled a diagnosis of vaginal angiomatosis. After 12 months follow-up, no relapse occurred. Our institution is a teaching hospital, and the patient signed an informed consent for the use of examination results and/or biological material for educational purposes as well as for the publication of this case report and any accompanying images.

Discussion

Angiomatosis of vagina is very rare and is often an incidental finding because of the small size of the tumors and their asymptomatic nature (6). It is difficult to clinicoradiologically differentiate angiomatosis from other neoplastic conditions. Angiomatosis should be distinguished from the other vascular tumors, particularly capillary hemangioma, cavernous venous hemangioma, arteriovenous malformation (AVM), and papillary endothelial hyperplasia (PEH) apart from bacillary angiomatosis, juvenile hemangioma, pyogenic granuloma, angiokeratoma, Kaposi's sarcoma, and angiosarcoma.

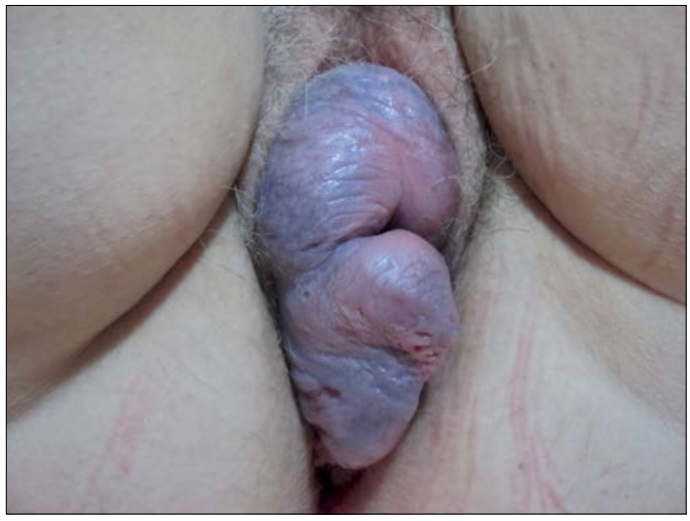

Figure 1. Violaceous irregular soft tissue with hemorrhagic spots in the lower third of the vaginal wall

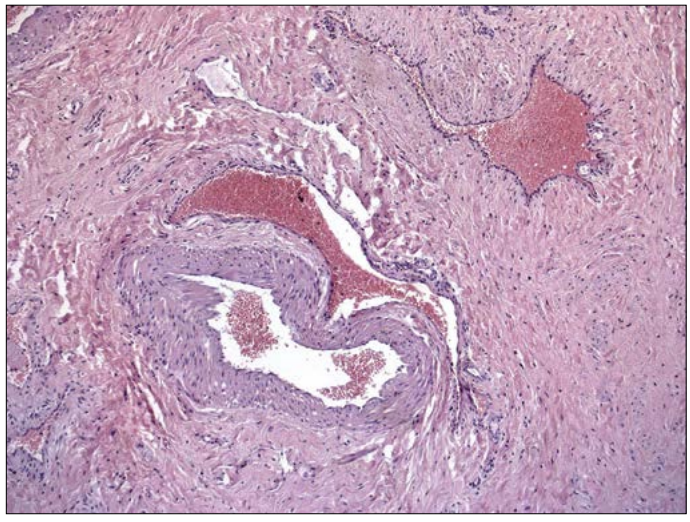

Figure 2. Arterial vessel with thick walls, including smooth muscle cells coexisting with venous vessels [hematoxylin and eosin (H&E), 5×]

PEH (Masson's tumor) occurs in the lumen of a dilated venous vessel in the vicinity of an organizing thrombus. It is probably a reactive lesion rather than a neoplastic one that incidentally arises during the organization process of older thrombi (7). In our case, histopathological exam revealed the presence of similar papillary structures in some vascular lumens; however, PEH is a focal lesion and usually does not involve arteries.

AVMs are fast-flow vascular malformations comprising a complex vessel network that directly connects feeding arteries to draining veins. The intervening normal capillary network is absent, and the microscopic appearance is characterized by the presence of both veins and arteries with dilated lumens. AVM shows similar morphological characteristics of angiomatosis; however, it is a focal but not well demarcated lesion, whereas angiomatosis occurs all over the body at multiple sites (5). Furthermore, our case demonstrated some features that were always absent in AVM-like clusters of capillaries.

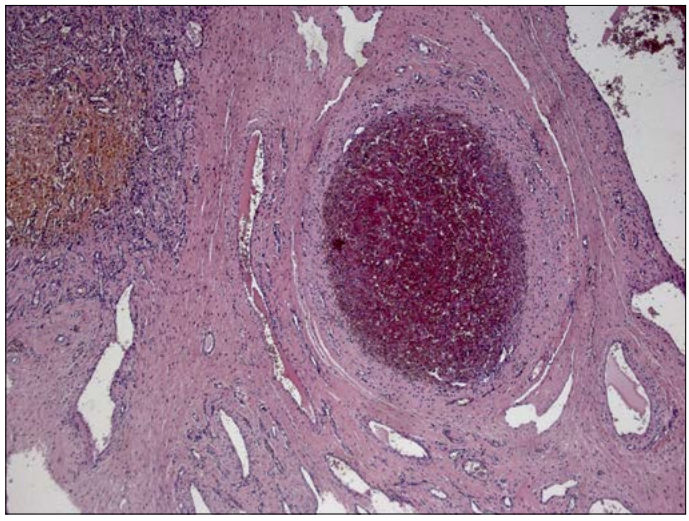

Figure 3. Proliferation of capillaries within an organized thrombus (right) and scattered in the deeper layers of the vaginal wall (left) [hematoxylin and eosin (H&E), 5×]

Non infiltrating margins of the lesion, absence of remarkable nuclear atypias, or mitosis rules the diagnosis of malignancies.
Majority of the cases of angiomatosis involving the pelvis and thigh are reported in Klippel–Trenaunay–Weber syndrome (8). This syndrome is characterized by localized angiomatosis, venous varicosities, and asymmetric osseous hypertrophy of the ipsilateral extremity (3). Our patient did not demonstrate any other systemic abnormality; therefore, she could be an even rarer presentation of angiomatosis outside Klipper–Trenaunay–Weber syndrome. A large angiomatosis could carry a high risk of intravascular coagulation and Kasabach–Merritt syndrome (9). This syndrome, usually affecting infants and also known as hemangioma with thrombocytopenia, leads to decreased platelet counts and sometimes other bleeding problems that can be life threatening. Patients uniformly demonstrate severe thrombocytopenia, low fibrinogen levels, high fibrin degradation products (due to fibrinolysis), and microangiopathic hemolysis (10). Hence, early diagnosis is required to avoid such disastrous complications.
Bacillary angiomatosis is a form of angiomatosis associated with a bacteria of the *Bartonella* genus. It can manifest in people with acquired immune deficiency syndrome and rarely appears in those who are immunocompetent. Cutaneous bacillary angiomatosis is characterized by the presence of lesions on or under the skin. Appearing in numbers from one to hundreds, these lesions may take several forms: papules or nodules that are red, globular, and non blanching with a vascular appearance; purplish nodules sufficiently similar to Kaposi's sarcoma; and purplish lichenoid plaque or subcutaneous nodule that may have ulceration similar to a bacterial abscess. Fever and bacteremia are other conditions frequently observed. In our case, features indicative of bacillary angiomatosis were absent.
In conclusion, accurate clinicoradiological examination is required to appropriately define the lesion and to detect associated congenital anomaly. Pathological examination is essential to arrive at a definite diagnosis and to exclude a possibility of malignant vascular tumor. Surgical excision is curative, and no recurrences are usually observed.

Ethics Committee Approval: *N/A*

Informed Consent: *Written informed consent was obtained from patient who participated in this case.*

Peer-review: *Externally peer-reviewed.*

Author Contributions: *Concept - F.G., E.M.M.; Design - F.G., E.M.M., A.R.; Supervision - E.M.M., M.L.D., G.B.; Resource - R.R., F.F.; Materials - F.G., E.M.M., A.R.; Data Collection and/or Processing - A.R., R.R., M.L.D.; Analysis and/or Interpretation - F.G., F.F., M.L.D.; Literature Search - R.R., F.F., A.R.; Writing - F.G., A.R., R.R.; Critical Reviews - E.M.M., G.B.*

Conflict of Interest: *No conflict of interest was declared by the authors.*

Financial Disclosure: *The authors declared that this study has received no financial support.*

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What is your diagnosis?

A 29-year-old well-adjusted male presented with complaints of cyclical hematuria and pain for 6 months and a loss of libido and erectile dysfunction for 2 years. Although he had a predominantly male phenotype as evidenced by the male body habitus and normal virilization, he had gynecomastia. Hormonal analysis revealed low levels of serum testosterone (170 ng/dL) and elevated levels of luteinizing hormone (13.1 mIU/mL), follicle-stimulating hormone (FSH) (12.3 mIU/mL) and estradiol (85.5 pg/mL). On ultrasound (Figure 1a, b) and magnetic resonance imaging (MRI), an undescended testis was observed in the left inguinal canal. The right testis was not visualized, but an ovary with multiple follicles was observed on the right side. A rudimentary blood-filled uterus was observed in the right hemipelvis alongside the right ovary with abnormal communication with the prostatic urethra (Figure 2a, 2b). Intravenous pyelogram was normal. Chromosomal analysis revealed a 46, XX karyotype.

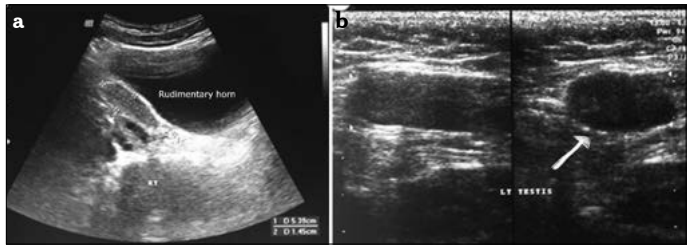

Figure 1. a, b. Ultrasound image showing a uterus-like structure with an ovary on the right side (a); ultrasound image showing testis in the inguinal region on the left side (b)

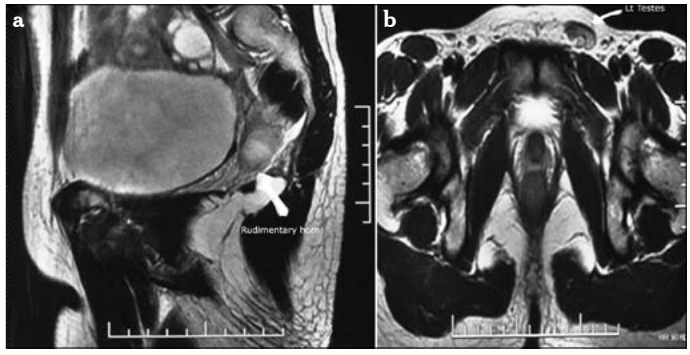

Figure 2. a, b. T2-weighted MRI images showing a rudimentary blood-filled horn with ovary on the right side (a); T2-weighted MRI images showing testis on the left side in the inguinal region (b)

Address for Correspondence: *K. Aparna Sharma, Department of Obstetrics and Gynecology, All India Institute of Medical Sciences, New Delhi, India. Phone: +919711824415 e.mail: kaparnasharma@gmail.com*

DOI:10.5152/jtgga.2015.15023

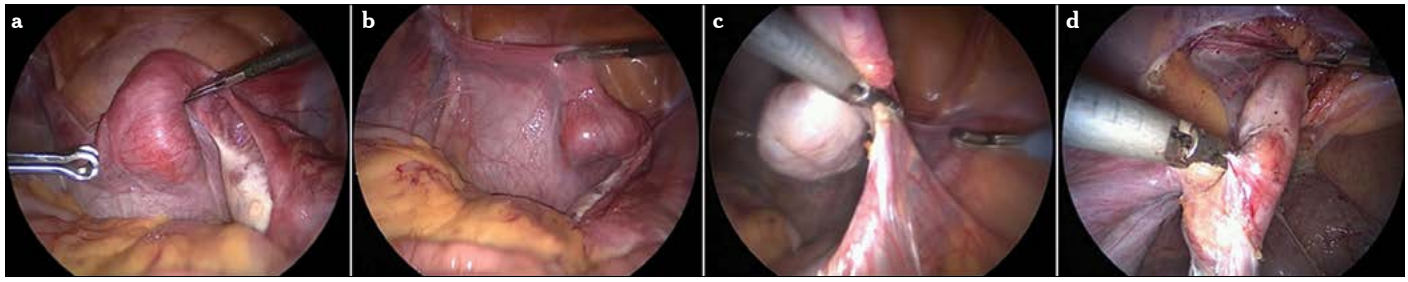

Figure 3. a-d. Laparoscopic findings showing rudimentary horn with the right fallopian tube and ovary (a); laparoscopic findings showing left testis in the inguinal canal (b), right salpingo-ovariotomy (c), and left orchidetomy (d)

Answer

Laparoscopy revealed an ovary and a rudimentary uterine horn on the right side and inguinal testes on the left side (Figure 3a, 3b). The patient underwent laparoscopic rudimentary uterine horn excision with right salpingo-ovariotomy (Figure 3c) and left orchidectomy (Figure 3d). Histopathological examination revealed a small uterus with an ovary on one side with normal ovarian parenchyma and testis on the other with testicular parenchyma with marked tubular atrophy and hyalinization with Leydig cell hyperplasia.

Ovotesticular disorder of sex development (ovotesticular DSD) (earlier known as true hermaphroditism) is a very rare disorder in which an infant is born with the internal reproductive organs (gonads) of both sexes (female ovaries and male testes) (1, 2). The gonads can be of any combination, ovary, testes, or combined ovary and testes (ovotestes). The external genitalia can either be ambiguous or can range from normal male to normal female. Here we describe a case of ovotesticular DSD who was raised as a male and who presented in adulthood because of failing testicular function.

In true hermaphrodites, it is rare to witness a well-adjusted adult male presenting so late with hematuria. In this case, gynecomastia at puberty is indicative of a functional ovary. The male external genitalia, sexual orientation, and intact erectile function till the early twenties are suggestive of a well-functioning testis. Testicular failure due to dysgenetic changes has been reported in true hermaphrodites (3). In our case, there is a possibility of failing testicular function and a dominance of ovarian function resulting in loss of libido and initiation of menstruation. Most of the reported cases have ambiguous genitalia with a uterus, cervix, or vagina; however, complete male phenotype is scarcely observed in patients with ovotesticular DSD. In one of the reports by Dutta et al. (4), a 15-year-old phenotypic male presented with three episodes of cyclical hematuria and biochemically normal serum testosterone levels with elevated gonadotropins levels. In another report (5), an 18-year-old male patient presented with bilateral scrotal pain with scrotal swelling and bilateral gynecomastia and a 46, XX karyotype.

Because of the rarity of the condition, the most appropriate management remains uncertain. In our case, the patient was raised as a male and presented unusually late at the age of 29 years. The decision for bilateral gonadectomy was taken in view of subnormal testicular function as evidenced by low testosterone and raised gonadotropin levels. This was later confirmed by the histopathology of the testes. Furthermore, the patient was very apprehensive regarding even 4%–5% risk of malignancy in the inguinal testes and preferred to have it removed.

Kandala Aparna Sharma[1], Vatsla Dadhwal[1], Ashish Kumar Saini[2], Sumita Agarwal[1], Shobha Kandpal[1]

[1]Department of Obstetrics and Gynecology, All India Institute of Medical Sciences, New Delhi, India

[2]Department of Urology, All India Institute of Medical Sciences, New Delhi, India

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Use of operative laparoscopy in single incision and natural orifice transvaginal surgery

To the Editor,

I read with interest the article titled "Single-incision-two port laparoscopic tubal ligation: A cost comparison and technique description" by Drs Nicel Taşdemir, Remzi Abali, Cem Çelik, Erson Aksu, and Didem Akkuş. J Turk Ger Gynecol Assoc 2015; 16: 30-1 that was published online on March 1, 2015 (1). The authors compare the traditional 2-port laparoscopy with a single incision using two 5 mm trocars. We had a different experience while using a laparoscope with an operative channel to place a bipolar cautery in tubal ligations; thus, limiting to a one-port laparoscopy. Furthermore, we used a laparoscope with a 6-mm operative channel to place different instruments in single incision (2) and in natural orifice transvaginal cholecystectomies (3). The operative laparoscope is not a new instrument; however, it should not be disregarded and is probably still utilized in many hospitals. It is my opinion that revisiting laparoscopy techniques using this operative laparoscope could further enhance the concepts of minimally invasive surgery.

Daniel Tsin

Department of Gynecology, Division of Natural Orifice Surgery, New European Surgical Academy, Berlin, Germany

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Author's Response

We thank the authors for their valuable comments on our study. Minimally invasive surgery has come to the fore in many areas (1-3). Many minimally invasive surgical techniques have been developed; therefore, many different techniques for this type of surgery are available (4). The most important limitation of minimally invasive surgery is cost. Single-port laparoscopy also involves additional costs. With the techniques that we described, material costs decreased approximately six times (from 365 Euros to 66 Euros) (5). The aim of this article was to show that we can perform minimally invasive surgery at a lower cost. We agree that revisiting laparoscopic techniques using operative laparoscopes could further enhance the concept of minimally invasive surgery. We hope that this technique and the authors' suggestions would lead to an increase in the use of minimally invasive surgery.

Nicel Taşdemir

Department of Obstetrics and Gynecology, Namık Kemal University Faculty of Medicine, Tekirdağ, Turkey

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Address for Correspondence: *Daniel Tsin, Department of Gynecology, Division of Natural Orifice Surgery, New European Surgical Academy, Berlin, Germany*
Phone: (917) 226-0185 e.mail: lasergyn@aol.com

DOI:10.5152/jtgga.2015.15067

JTGGA CME/CPD CREDITING

Questions on the article titled "*Parasitic myoma after laparoscopic surgery: a mini-review*" within the scope of CME/CPD

1. Which of the following is wrong about parasitic myomas?
   a) Parasitic myomas after laparoscopic surgery are rarely asymptomatic
   b) Intestinal complications have been reported during the surgery for parastic myomas
   c) Pouch of Douglas is the most common location for parasitic myomas after laparoscopic surgery
   d) The first report describing parasitic myomas after laparoscopic surgery was published in 1997
   e) Adenomyotic masses after laparoscopic surgery have been reported in the literature

2. Which of the following is not a risk factor for leiomyomatosis peritonealis disseminata?
   a) Genetic basis
   b) Oral contraceptive pills
   c) Pregnancy
   d) Endometriosis
   e) Prior surgery

3. What is the most common presenting symptom of parasitic myomas?
   a) Palpable mass
   b) Abdominal pain
   c) Asymptomatic
   d) Abdominal distention
   e) Dysmenorrhea

4. Which location is more common for iatrogenic parasitic myomas?
   a) Lumbar region
   b) Trocar site
   c) Uterine tube
   d) Bowel mesentery
   e) Colonic serosa

5. Which of the followings is wrong about the effects of insulin in obese women?
   a) Extensive and complicated surgery may be required for parasitic myomas
   b) Most of the cases involved a history of morcellation
   c) Parasitic myomas have been reported in areas far from the pelvis, including the diaphragm
   d) There is a FIGO classification system for parasitic myomas based on location
   e) Symptoms of parasitic myomas are not specific

6. Which of the following is wrong about parasitic myomas after laparoscopic surgery?
   a) In the last decades, there have been increasing reports of parasitic myomas
   b) Laparoscopic myomectomy is the only surgery related to the iatrogenic parasitic myomas
   c) Receptor status and hormone levels can affect the clinical course
   d) The degree of Trendelenburg position may be related to the location of parasitic myomas
   e) Necessity of extensive surgery because of the location of parasitic myomas should be discussed with the patient

JTGGA CME/CPD CREDITING

Answer form for the article titled *"Parasitic myoma after laparoscopic surgery: a mini-review"* within the scope of CME/CPD

1st Question	A	B	C	D	E

2nd Question	A	B	C	D	E

3rd Question	A	B	C	D	E

4th Question	A	B	C	D	E

5th Question	A	B	C	D	E

6th Question	A	B	C	D	E

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CONGRESS CALENDAR

INTERNATIONAL MEETINGS

05-07 September, 2015	**International Pelviperineology Congress** İstanbul, Turkey http://www.pelviperineology2015.org/
17-19 September, 2015	**The 22nd World Congress on Controversies in Obstetrics, Gynecology & Infertility (COGI)** Budapest, Hungary http://www.congressmed.com/cogi/
18-20 September, 2015	**NESA Days 2015** Berlin, Germany http://www.nesacademy.org
17-21 October, 2015	**ASRM Annual Meeting Baltimore** Maryland, United States http://www.asrmannualmeeting.org
29 October - 1 November, 2015	**The 9th ESIGOG / 1st ISIDOG European Conference** Latvia, Riga http://www.isidog-riga2015.com/
07 November, 2015	**5th Stuttgarter Gynakologen-Herbsttag** Stuttgart, Germany
15-19 November 2015	**AAGL 2015 Global Congress on Minimally Invasive Gynecology,** Las Vegas, Nevada https://www.aagl.org/

NATIONAL MEETINGS

14-17 October, 2015	**7th National Urogynecology Congress** İstanbul, Turkey http://www.urojinekoloji2015.org/eng/
15-18 October, 2015	**15th National Congress of Perinatal Medicine** Muğla, Turkey www.perinatoloji2015.org
29 October - 1 November, 2015	**5th Reproductuve Medicine & Surgery Congress** Antalya, Turkey http://www.utd2015.org/
29-31 October, 2015	**Turkey Maternal Fetal Medicine and Perinatology Association Ultrasonography Course** İstanbul, Turkey http://tmftp.org/
12-14 November, 2015	**12th Traditional Zekai Tahir Burak Days** Ankara, Turkey http://www.ztbgunleri2015.org/
11-15 May, 2016	**XI Turkish German Gynecologic Congress** Antalya, Turkey http://www.tajev2016.org

TÜRKÇE ÖZLER-EYLÜL 2015

Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 126-136 DOI:10.5152/jtgga.2015.15038

Plasenta tutunma anomalisi tanısında üç boyutlu çok kesitli Doppler görüntülemenin doğruluğu

Alaa M. Abdel Moniem[1], Ahmed Ibrahim[2], Sherif A. Akl[2], Loay Aboul-Enen[1], Ibrahim A. Abdelazim[3]

[1]Department of Ultrasound and Fetal Care Unit, Ain Shams University, Cairo, Egypt
[2]Department of Obstetrics and Gynecology, Ain Shams University, Cairo, Egypt
[3]Department of Obstetrics and Gynecology, Ain Shams University, Cairo, Egypt and Ahmadi Kuwait Oil (KOC) Company Hospital, Ahmadi, Kuwait

ÖZ

Amaç: Çalışmanın amacı plasenta tutunma anomalisi (PTA) tanısında üç boyutlu çok kesitli Doppler görüntülemenin (3D MSV) doğruluğunu belirlemektir.

Gereç ve Yöntemler: PTA şüphesi taşıyan ve hamileliğinin 28.hafta ve üzerinde olan 50 hamile kadın bu prospektif çalışmaya dahil edildi. Gebelik süresi, plasental yerleşim ve PTA varlığı şüphesine neden olan bulguları doğrulamak amacıyla tüm katılanlara trans-abdominal gri-skala ultrason taraması yapıldı. Daha sonra da PTA tanısını doğrulamak için, 3D power Doppler ve de 3D MSV Doppler uygulandı. PTA tanısında 3D MSV Doppler doğruluğunu tespit etmek amacıyla, intraoperatif bulgular ve acil histerektomi ile çıkarılan uterinin histopatoloji sonuçları preoperatif sonografik bulgularla karşılaştırıldı.

Bulgular: 3D MSV Doppler, 3D power doppler ile karşılaştırıldığında, PTA tanısal kriterlerinin doğruluğunu ve belirleyicilik değerlerinin artırmıştır. PTA vakalarında zor plasental ayrım ve önemli ölçüdeki intraoperatif kan kaybını belirlemek için, periferik subplasental alanın üzerindeki kalabalık damarların 3D power Doppler kullanılarak elde edilen duyarlılığı ve negatif prediktif değeri (NPD) (sırasıyla % 79.6 ve %82.2), 3D MSV doppler kullanarak sırasıyla %82.6 ve %84'e yükseldi. Ayrıca PTA vakalarında acil histerektominin tespiti için, uterin seroza-mesane ara yüzünün bozulmasının 3D power Doppler kullanılarak elde edilen duyarlılık, özgüllük ve pozitif prediktif değeri (PPD), 3D MSV Doppler ile sırasıyla %100, %71.8 ve %50'a yükseldi.

Sonuç: Üç boyutlu MSV Doppler, PTA tanısını netleştirmek için, 3D power Doppler veya renkli Dopplere ek olarak faydalı bir yöntemdir.

Anahtar Kelimeler: Çok kesitli görüntü, Doppler, plasenta tutunma anomalisi

Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 137-144 DOI: 10.5152/jtgga.2015.15251

Over kanser hastalarından oluşan geniş bir kohort çalışmada florodeoksiglikoz pozitron emisyon tomografisi/bilgisayarlı tomografinin diagnostik ve prognostik açıdan değerlendirilmesi ve serum kanser antijen-125 (CA125) ile ilişkisi

Laura Evangelista[1], Maurizia Dalla Palma[2], Michele Gregianin[1], Margherita Nardin[3], Anna Roma[2], Maria Ornella Nicoletto[2], Giovanni Battista Nardelli[4], Vittorina Zagonel[2]

[1]Radiotherapy and Nuclear Medicine Unit, Istituto Oncologico Veneto IOV – IRCCS, Padova, Italy
[2]Medical Oncology Unit, Istituto Oncologico Veneto IOV – IRCCS , Padova, Italy
[3]Oncological Radiology Unit, Istituto Oncologico Veneto IOV – IRCCS , Padova, Italy
[4]Department of Gynecological Sciences and Human Reproduction, University of Padova, Padova, Italy

ÖZ

Amaç: Over kanserli (OK) hastalarda nükseden hastalık, tedaviye verilen yanıt ve hastaların uzun dönem takibinde 18F-florodeoksiglikoz (FDG) pozitron emisyon tomografisi/bilgisayarlı tomografinin (PET/BT) etkinliği, kanser antijen-124 (CA125) düzeyleri ve bu modalitenin bu altkümedeki prognostik anlamı ile ilişkili olarak değerlendirildi.

Gereç ve Yöntemler: 2005 ve 2015 yılları arasında, hastanemizde FDG PET/BT uygulanan ve OK'den etkilenen 125 hasta retrospektif olarak değerlendirildi. PET/BT endikasyonları 78 hastada hastalığın nüksü, 29 hastada tedaviye yanıt değerlendirmesi ve 18 hastada takip olarak belirlendi. FDG PET/BT sonuçları histopatoloji sonuçları ve en az 6 aylık takip süresinde gözlemlenen radyolojik progresyon ile karşılaştırıldı. Uzun dönem takip medyan 33 ay olarak bulundu. Farklı klinik ortamlar açısından diagnostik doğruluk değerlendirildi. Global sağkalım (GS), FDG PET/BT sonuçları ve CA125 seviyeleri hem Kaplan-Meier hem de Cox regresyon analizleri ile değerlendirildi.

Bulgular: CA125 sonuçları 62 hastada pozitif (>35 UI/mL) ve 63 hastada negatif (% 49 ve %51) olarak bulundu. CA125 duyarlılık ve özgüllüğü sırasıyla %72 ve %91 olarak tespit edildi. PET/BT görüntüleme, nükseden hastalığın değerlendirilmesinde duyarlılığı %98.6 ve özgüllüğü %77.8 olarak, tedavinin değerlendirilmesi açısından da duyarlılığı 72.7% ve özgüllüğü %88.9 olarak ortaya koydu. Diğer yandan, takip aşamasında değerlendirilen 18 hastada duyarlılık % 82.3 olarak tespit edildi. FDG PET/BT uygulandığında negatif CA125 değeri varlığında, negatif PET/BT durumunda ve PET ile periton reküransı ve uzak metastaslara dair kanıt belirlenmediğinde, GS oranı anlamlı ölçüde daha yüksekti. Çok değişkenli regresyon analizine göre, sadece yaş ve PET ile belirlenen periton reküransı kötü prognozun bağımsız prediktörleri olarak saptandı.

Sonuç: Over kanserinden şüphelenilen ve hatta tümör belirteci CA125 değeri normal aralıkta olan hastalarda FDG PET/BT ile metabolik görüntülemenin faydalı olduğu kanıtlanmıştır. Pozitif PET/BT tarama sonucu ve PET'de periton reküransı varlığı, yaklaşık 30 ay sonra ortaya çıkan kötü prognoz ile ilişkili bulunmuştur.

Anahtar Kelimeler: Over kanseri, FDG-PET/BT, CA125, hastalıksız sağkalım, genel sağkalım

Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 145-148 DOI: 10.5152/jtgga.2015.15074

Yeni bir partogram tipi kullanımının sezaryen oranları üzerindeki etkisi

Georgios Vlachos[1], Panagiotis Tsikouras[1], Bachar Manav[1], Grigorios Trypsianis[1], Vasileios Liberis[1], Sakellarios Karpathios[2], Georgios Galazios[1]

[1]Department of Obstetrics and Gynecology, Democritus University of Thrace, Alexandroupolis, Greece
[2]Department of Obstetrics and Gynecology, Emeritus Assistant Professor, 1st University Alexandra Hospital, Athens, Greece

ÖZ

Amaç: Bu çalışmanın amacı, doğum izlemede kullanılan yeni bir partogram tipinin sezaryen oranlarına katkısını değerlendirmektir.

Gereç ve Yöntemler: Çalışmaya iki gruba bölünmüş, komplike olmayan tekil gebeliği olan hamileler dahil edildi. Doğumun izleminde iki tip partogram kullanıldı. Birinci grupta klasik WHO partogram (A) kullanıldı. İkinci grupta ise, servikal dilatasyon ve aşağı doğru inen başın pozisyonunun (B) değerlendirildiği ve rapor edildiği yeni bir partogram tipi kullanıldı. Doğumun süresi ve sezaryen oranları hesaplandı ve her iki grupta karşılaştırıldı.

Bulgular: Doğum süresinde (aktif doğum aşamasının başlamasından doğum zamanına kadar geçen süre) (dt1+dt2+dt3) ($p<0.001$, A: medyan: 318.4±10.4 dk. , B: 246.56±8.28 dk.) ve sezaryen oranlarında istatiksel olarak önemli bir azalma kaydedildi ($p<0.001$, A: 89 ve B: 49).

Sonuç: Yeni partogram tipinin, uzamış doğum insidansını azaltma ve sezaryen oranlarını düşürme gibi potansiyel faydaları bulunmaktadır.

Anahtar kelimeler: Yeni partogram tipi, sezaryen oranı, doğum yönetimi

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Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 149-152 DOI: 10.5152/jtgga.2015.15087

Menapozlu kadınlarda uyku kalitesinin değerlendirilmesi: Pittsburg Uyku Kalitesi İndeksi ve polisomnografi sonuçları

Kağan Ağan[1], Recep Özmerdivenli[1], Yıldız Değirmenci[2], Mete Çağlar[3], Alper Başbuğ[3], Ege Güleç Balbay[4], Mehmet Ali Sungur[5]

[1]Düzce Üniversitesi Tıp Fakültesi, Psikoloji Anabilim Dalı, Düzce, Türkiye
[2]Düzce Üniversitesi Tıp Fakültesi, Nöroloji Anabilim Dalı, Düzce, Türkiye
[3]Düzce Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Düzce, Türkiye
[4]Düzce Üniversitesi Tıp Fakültesi, Göğüs Hastalıkları Anabilim Dalı, Düzce, Türkiye
[5]Düzce Üniversitesi Tıp Fakültesi, Biyoistatistik ve Tıbbi Bilişim Anabilim Dalı, Düzce, Türkiye

ÖZ

Amaç: Bu çalışmanın amacı menapoz dönemindeki kadınlarda sübjektif uyku kalitesini araştırmak ve olası uyku bozukluklarını objektif olarak polisomnografi (PSG) ile doğrulamak ve tanı koymaktır.

Gereç ve yöntemler: Altmış yedi menapozlu kadın çalışmaya alındı. Sosyo-demografik özellikler ve menapozun özellikleri kaydedildi. Subjektif uyku kalitesi Pittsburg Uyku Kalitesi İndeksi (PUKİ) ile değerlendirildi. Uyku bozukluklarını doğrulamak ve altta yatan sebebin ileri tanısı için, PUKİ skoru 5' in üzerinde olan, onam vermiş kadınlara PSG değerlendirmesi yapıldı.

Bulgular: Normal PSG değerlendirmesi olan kadınların ortalama PUKİ skoru 12,00±3,16 iken, anormal PSG değerlendirmesi olan kadınların ortalama PUKİ skoru 11.00±2.32 idi ($p=0.466$).

Kadınların % 59.7' sinin ($n=40$) uyku kalitesi kötüydü. Bunların 11' inde (% 64.7) PSG değerlendirme sonuçları anormaldi ve obstrüktif uyku apne sendromu tanısı aldı (OUAS). % 54.5 ' u hafif OUAS iken, % 27.3 ' ünde orta, % 18.2 ' sinde ileri OUAS vardı.

Sonuç: PUKİ ve PSG değerlendirmeler, uyku problemlerinin saptanmasına olanak sağlayacak ve menapozdaki uyku bozukluklarının altta yatan sebeplerine göre tedavi seçeneklerine ışık tutacaktır.

Anahtar kelimeler: Menapoz, uyku bozukluğu, Pittsburg uyku kalite indeksi, polisomnografi

Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 153-157 DOI: 10.5152/jtgga.2015.15163

Figo evre 1a grade 2 endometrioid tip endometrial adenokarsinomda adjuvant radyoterapi gerekli mi?

Abdurrahman Hamdi İnan[1], Gülçin Şahin Ersoy[2], Yusuf Yıldırım[3], Tutku Gürbüz[1], Ayşe Gül Kebapçılar[4], Merih Hanhan[5]

[1]Ardahan Devlet Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Ardaha, Türkiye
[2]Marmara Üniversitesi Pendik Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, İstanbul, Türkiye
[3]Erzincan Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Jinekolojik Onkoloji Bölümü, Erzincan, Türkiye
[4]Selçuk Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Konya, Türkiye
[5]İzmir Aegean Kadın Hastalıkları ve Doğum Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Jinekolojik Onkoloji Bölümü, İzmir, Türkiye

ÖZ

Amaç: International Federation of Gynecology and Obstetrics (FIGO) evre 1a - grade 2 endometrioid tip endometrial adenokarsinom vakalarında adjuvan radyoterapinin sağ kalıma ve lokal rekürrenslere etkisinin araştırılmasıdır.

Gereç ve Yöntemler: Tedavi ve takipleri yapılan FIGO evre 1a - grade 2 endometrioid adenokarsinomlu 82 hastaya ait dosyalar incelendi. Postoperatif adjuvan radyoterapi verilen 59 hasta adjuvan radyoterapi almayan 23 hastalık kontrol grubu ile rekürrens ve metastaz varlığı ile sağkalım süreleri açısından karşılaştırıldı.

Bulgular: Adjuvan radyoterapi alan grupta ve kontrol grubunda local rekürrens oranı sırasıyla %4,3, %1,7 (p=0,485), uzak metastaz oranı %4,3, %6,9 (p=1,000), ortalama sağkalım süresi 83,6±38,7 ve 81,5±37,5 ay (p=0,828) olarak saptandı.

Sonuç: Sunulan çalışmada adjuvant radyoterapi uygulamasının düşük risk grubu (Evre 1A ve Grade I-II) hastalarında sağkalıma olumlu bir katkı sağlayamadığı saptanmıştır. Radyasyon toksisitesi açısından da ciddi bir risk oluşturan postoperatif radyoterapi prokolünün bu hasta grubunda kullanımı tartışmalıdır. Sözkonusu hastalar primer cerrahi girişimi takiben yakın gözetim altında tutulmalı ve vajinal relapsların yönetiminde kurtarma tedavisi olarak radyoterapinin çok etkin bir tedavi modalitesi olduğu unutulmamalıdır.

Anahtar kelimeler: Endometrium kanseri, adjuvan radyoterapi, ortalama yaşam süresi

Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 158-163 DOI: 10.5152/jtgga.2015.15034

Elektif sezaryanlarda kan kaybı: Anestezi türüne ilişkin bir fark var mı? Bir randomize prospektif çalışma

Hüseyin Aksoy[1], Ülkü Aksoy[2], Burak Yücel[3], Sezin Saygı Özyurt[4], Gökhan Açmaz[4], Mustafa Alparslan Babayiğit[5], Günhan Gökahmetoğlu[6], Turgut Aydın[3]

[1]Kayseri Askeri Hastane, Kadın Hastalıkları ve Doğum Anabilim Dalı, Kayseri, Türkiye
[2]Kayseri Memorial Hastanesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Kayseri, Türkiye
[3]Kayseri Acıbadem Hastanesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Kayseri, Türkiye
[4]Kayseri Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Kayseri, Türkiye
[5]Gülhane Askeri Medikal Akademi, Halk sağlığı ve Epidemiyoloji Anabilim Dalı, Ankara, Türkiye
[6]Kayseri Eğitim ve Araştırma Hastanesi, Anesteziyoloji Anabilim Dalı, Kayseri, Türkiye

ÖZ

Amaç: Bu çalışmada genel veya spinal anestezinin elektif sezaryan ile doğumlarda anne kan kaybı üzerinde etkisinin olup olmadığı araştırılmıştır.

Gereç ve Yöntemler: Prospektif randomize kontrollü çalışmamıza sezaryen ameliyatı ile doğumu planlanan sağlıklı, tekiz 37 ila 41 gestasyonel haftalık gebeliği olan 418 hasta dahil edilmiştir. Hastalar randomize edilerek 2 gruba ayrılmıştır: Genel anestezi grubu ve spinal anestezi grubu. Tüm sezaryen ile doğum operasyonları benzer cerrahi teknik ile uygulanmıştır. Gruplardaki anestezi prosedürleri de benzer idi. Birincil sonuç verisi kan kaybı idi ve karşılaştırma hemoglobin ve hematokrit sonuçları üzerinden yapıldı.

Bulgular: Sezaryen operasyonları öncesi hemoglobin ve hematokrit değerleri iki grupta benzerdi (sırasıyla, $p=0.08$ ve $p=0.239$). Spinal anestezi uygulanan grupta daha az kan kaybı gözlendi. Her iki grup için ameliyat öncesi ve sonrası hemoglobin ve hematocrit değerleri istatistiksel olarak anlamlı düzeyde farklı idi ($p<0.001$).

Sonuç: Bu çalışma düşük riskli elektif sezaryen ile doğum yapan hastalarda spinal anestezinin genel anesteziye oranla daha az kan kaybı ile ilişkili olduğunu göstermiştir.

Anahtar kelimeler: cerrahi kan kaybı, sezaryen doğum, obstetrik anestezi

Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 164-169 DOI: 10.5152/jtgga.2015.15128

Morbid obes erken evre endometrium kanserli hastaların tedavisinde laparoskopi ve laparotominin karşılaştırılması

Özgür Bige[1], Ahmet Demir[2], Bahadır Saatli[3], Meral Koyuncuoğlu[4], Uğur Saygılı[3]

[1]Tekirdağ Star Medica Hastanesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Tekirdağ, Türkiye
[2]Elazığ Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Elazığ, Türkiye
[3]Dokuz Eylül Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, İzmir, Türkiye
[4]Dokuz Eylül Üniversitesi Tıp Fakültesi, Patoloji Anabilim Dalı, İzmir, Türkiye

ÖZ

Amaç: Morbid obes erken evre endometrium kanserli kadınlarda total laparoskopik histerektomi ile total abdominal histerektominin sonuçlarını karşılaştırmaktır.

Gereç ve Yöntemler. Bu prospektif calışma vücut kitle indeksi 35 kg/m^2 ve daha büyük olan evre 1 endometrium kanser nedeniyle başvuran 140 morbid obes kadın üzerinde yapıldı. Hastalara total laparoskopik histerektomi (n=70) veya total abdominal histerektomi (n=70),bilateral salfingooferektomi , pelvik lenfadenektomi ve periton yıkama işlemeleri uygulandı.Yaş, parite, menopozal durum, ağırlık, boy, tıbbi problemler, önceki laparotomi hikayesi, cerrahi prosedür, operasyon süresi, tahmini kan kaybı, preoperatif ve post operatif hemotokrit, operasyona bağlı komplikasyonlar, laparotomiye dönüş, intraoperatif ve postoperatif kan tranfüzyon ihtiyacı , intraoperatif ve postoperatif komplikasyonlar, ikincil cerrahi, tümör evresi, graydi ve histolojisi, toplanan lenf nodu sayısı, görsel ağrı skorları kayıt edildi.

Bulgular: Laparatomi grubunda postoperatif komplikasyonlar anlamlı olarak yüksekti. Hastanede kalış süresi laparoskopi grubunda anlamlı olarak farklıydı (4.64 vs 10.36 gün, P< 0.001). Görsel ağrı skorları laparotomi grubunda postoperatif birinci, ikinci ve üçüncü günler ile hastaneden taburcu olunan günde anlamlı olarak yüksekti. Günlük normal aktiviteye dönüş laparotomi grubunda (34.70 gün) laparoskopi grubuyla (17.89 gün) karşılaştırıldığında anlamlı olarak daha uzun süre almaktadır.

Sonuç: Becerikli endoskopik cerrahların varlığında erken evre endometrium kanserli kadınların çoğunluğu laparoskopi ile tedavi edilirken, mükemmel cerrahi sonuçlar, kısa hastanede kalış süresi, daha az postoperatif ağrı, hız bir şekilde tam günlük aktiviteye dönüş eldeedilebir.

Anahtar kelimeler: Laparoskopi, endometrial karsinoma, morbid obese hastalar

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Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 170-173 DOI: 10.5152/jtgga.2015.15062

19-23 haftalık sağlıklı Türk gebelerde biorbital ve ınterorbital mesafelerin normal dağılımı ve kafa-yüz yapıları ile korelasyonu

Halil Gürsoy Pala[1], Burcu Artunç-Ülkümen[1], Faik Mümtaz Koyuncu[1], Yıldız Uyar[1], Yeşim Bülbül-Baytur[1]

[1]Celal Bayar Üniversitesi Tıp Fakültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Manisa, Türkiye

ÖZ

Amaç: İkinci trimester boyunca normal Türk gebelerde Biorbital (BOD) ve Interorbital (IOD) mesafeler için normal dağılımı saptamayı ve BOD, IOD ile diğer kafa-yüz yapıları ve biyometrik parametrelerin korelasyonunu belirlemeyi amaçladık.

Gereç ve yöntemler: Retrospektif çalışmamız, ikinci trimester taraması için 19-23. Gebelik haftaları arasında USG yapılan 1328 normal, tekil gebeliği içermektedir. BOD ve IOD ölçümleri, fetal yüzün koronal kesitinde orbital düzlemde elde edilmiştir.

Tartışma: Ortalama BOD 3.4±0.33 cm'di. Ortalama IOD 1.28±0.24 cm'di. Korelasyon analizinde; BOD anlamlı olarak IOD, transserebellar çap (TCD), cisterna magna (CM), ense pilisi (NF), burun kemiği (NB), biparyetal çap (BPD), kafa çevresi (HC), karın çevresi (AC), femur uzunluğu (FL) ve gebelik haftası ile korele olduğu saptandı. IOD ve lateral ventrikül arka boynuzu, TCD, CM, NF, NB, BPD, HC, AC, FL arasında istatistiksel olarak anlamlı ilişki mevcuttu.

Sonuç: Çalışmamızda var olan referans dağılım, ikinci trimester normal gebeliklerinde BOD ve IOD doğru değerlendirilmesine katkıda bulunmuştur. USG ile tespit edilen fetal orbital biyometrik anormallikler, anormal göz gelişimi ile ilişkili değişik anomaliler için değerlendirme gerektirir.

Anahtar kelimeler: Biorbital mesafe, interorbital mesafe, ikinci trimester taraması, Türk populasyonu

Özgün Araştırma

J Turk Ger Gynecol Assoc 2015; 16: 174-178 DOI: 10.5152/jtgga.2015.15016

Preterm eylem tedavisinde gliseril trinitrat

Şafak Çalışkan[1], Mehmet Ali Narin[2], Faruk Suat Dede[3], Raziye Narin[4], Hülya Dede[5], Ömer Kandemir[3]

[1]Nazilli Devlet Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Aydın, Türkiye

[2]Erzincan Üniversitesi Tıp Fkültesi, Kadın Hastalıkları ve Doğum Anabilim Dalı, Erzincan, Türkiye

[3]Etlik Zübeyde Hanım Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Ankara, Türkiye

[4]Numune Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Adana, Türkiye

[5]Zekai Tahir Burak Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, Ankara, Türkiye

ÖZ

Amaç: Bu çalışmada gliseril trinitrat (GTN) ve magnezyum sülfatın(MgSO4) tokolitik etkileri ile tedavi öncesi ve sonrası serum nitrik oksit(NO) metabolit seviyeleri araştırılmıştır.

Materyal ve Metod: Erken membran rüptürü olmayan, preterm eylem tehdidi tanısıyla takip edilen ve gebelik haftası 27 ile 34 hafta arasında değişen toplam 58 hasta randomize edilerek GTN veya MgSO4 tedavisi uygulandı. Her iki grupta tedavinin tokolitik etkinliği ve maternal yan etkileri değerlendirildi. Obstetrik ve neonatal sonuçlar ile birlikte, tedavi öncesi ve sonrası NO metobolit seviyeleri kaydedildi.

Bulgular: Çalışma kriterlerini karşılayan 41 hastanın sonuçları analiz edildi. Uterus kontraksiyonlarının durması GTN ve MgSO4 için sırasıyla 3.66 ± 1.28 ve 6.83 ± 3.47 saat olarak ölçüldü. GTN grubunda maternal yan etkiler MgSO4 grubuna göre belirgin olarak daha az gözlenmekle birlikte her iki grupta da ciddi yan etkiler izlenmedi. Tedavi grubunda kontrol grubuna göre serum NO metabolit seviyeleri, tedavi öncesine göre daha düşüktü. Hem GTN hem de MgSO4 tedavisi alan grupta serum nitrit seviyesi tokolitik tedavi sonrası yüksek olarak ölçüldü.

Sonuç: GTN preterm doğumu geciktirmede ve dolayısıyla neonatal morbidite ve mortaliteyi azaltmada MgSO4 kadar güvenli ve etkin bir tedavi yöntemi olarak görülmekte ayrıca maternal yan etkileri daha az oranda izlenmektedir.

Anahtar Kelimeler: Gliseril trinitrat, nitrikoksit, magnezyum sülfat, tokoliz

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Derleme

J Turk Ger Gynecol Assoc 2015; 16: 179-180 DOI: 10.5152/jtgga.2015.15045

Uterin transplantasyonunda DaVinci Robot kullanımının olası rolü

Christos Iavazzo[1], Ioannis D. Gkegkes[2]

[1]Department of Gynecological Oncology, Christie Hospital, Manchester, United Kingdom

[2]Department of Surgery, General Hospital of Attica "KAT", Athens, Greece

ÖZ

Minimal invasiv cerrahi, özellikle robotik cerrahi, son on yılda jinekoloji cerrahları tarafından yaygın olarak kullanılmaya başlanan bir tekniktir. İlk insan uterin transplantasyonunun gerçekleştirilmesiyle, uterin agenezi ve genç yaşta histerektomi öyküsü olan kadınlarda infertilite tedavisinde yeni perspektifler ortaya çıkmaya başlamıştır. Robot destekli yöntem mikrovasküler anastomoz, vajinal anastomoz ve bağ dokusu fiksasyonunu kolaylaştırarak işlemin güvenliğini geliştirebilir. Bu çalışma, uterin transplantasyonunda robotik cerrahinin olası rolünü açıklığa kavuşturmak amacıyla bir protokol düzenlemek için çok merkezli bir işbirliği grubunun oluşturulmasını önermektedir.

Anahtar kelimeler: Uterin transplantasyonu, da Vinci® Robot, etik, robot teknolojisi

Derleme

J Turk Ger Gynecol Assoc 2015; 16: 181-186 DOI: 10.5152/jtgga.2015.15242

Laparoskopik cerrahi sonrası parazitik myom: literatür derlemesi

Hakan Erenel[1], Osman Temizkan[1], Begüm Aydoğan Mathyk[1], Suat Karataş[1]
[1]Şişli Hamidiye Etfal Eğitim ve Araştırma Hastanesi, Kadın Hastalıkları ve Doğum Kliniği, İstanbul, Türkiye

ÖZ

Bu derlemenin amacı laparoskopik cerrahi sonrası gelişen parazitik myom olgularını gözden geçirmektir. PubMed veritabanı kullanılarak Ocak 1997 ve Aralık 2014 tarihleri arasındaki literatür taraması yapılmıştır.“Laparoskopik histerektomi”, “laparoskopik myomektomi”, “morselasyon”, “parazitik fibroidler”, “parazitik myomlar” ve “leiomyomatozis” anahtar sözcükleri kullanılmıştır. Derlemeye seçim kriterlerine uygun 53 parazitik myom cerrahisi geçirmiş vaka sunumu içeren 29 makale dahil edilmiştir. Parazitik myom morselasyon sonrası hastada kalan küçük myom parçalarından gelişen, semptomatik veya asemptomatik olabilen nadir bir durumdur. Nadir görülmesine rağmen hastalar laparoskopik cerrahi sonrası oluşan bu durumun riski hakkında bilgilendirilmelidir. Morselasyon sırasında ve sonrasında küçük myom parçalarını takip etmek, her bir parçayı çıkarmak için çaba göstermek cerrah açısından önemlidir.

Anahtar kelimeler: Laparoskopik histerektomi, laparoskopik myomektomi, morselasyon, parazitik fibroidler, parazitik myomlar, leiomyomatozis

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Olgu Sunumu

J Turk Ger Gynecol Assoc 2015; 16: 187-188 DOI: 10.5152/jtgga.2015.15027

Otolog yağ transplantasyonu ile G-noktası büyütme

Christian Herold[1], Melodi Motamedi[1], Uwe Hartmann[2], Sixtus Allert[1]
[1]Department of Plastic and Aesthetic Surgery, Sana Klinikum Hameln Pyrmont, Hameln, Germany
[2]Department of Psychiatry, Social Psychiatry, and Psychotherapy, Division of Psychology, Hannover Medical School, Hannover, Germany

ÖZ

G-noktası büyütme için lipofil çekici görünmektedir, çünkü yağın uzun dönem kalıcılığının çok iyi olması beklenir. Bu çalışmada cinsel zevki artırmak amacıyla G-noktası büyütme işlemi isteyen 29 yaşında bir hasta vakası sunulmaktadır. Trokanterik alandan alınan otolog yağ (8 cc) enjekte edildi. G-noktasının varlığını onaylayan az sayıda yayınlanmış veri olmasına rağmen, hasta işlemden memnundu ve herhangi bir yan etki görülmedi. Bununla birlikte, Fragebogen zur Lebenszufriedenheit (FLZ) ve Kurzfragebogen für sexuelle Probleme (KFSP-F) gibi standart anketlerle yapılan değerlendirmeler, cerrahi G-noktası büyütme işleminin sübjektif iyilik hali ve cinsel parametreler üzerinde pozitif etkileri olduğunu ortaya koymamıştır. Bu işlemin faydaları ve risklerine ilişkin doğrulanmış önerilerde bulunmadan önce, daha geniş hasta serilerini kapsayan çalışmalara gereksinim duyulmaktadır.

Anahtar kelimeler: G-noktası, yağ transplantasyonu, FLZ, KFSP-F, anket

Olgu Sunumu

J Turk Ger Gynecol Assoc 2015; 16: 189-191 DOI: 10.5152/jtgga.2015.15018

Vajinal anjiyomatoz: nadir bir vakanın ayırıcı tanısı

Flavio Grauso[1], Giancarlo Balbi[1], Maria Luisa D'Aponte[2], Andrea Ronchi[3], Roberto Russo[3], Francesca Falcone[1], Enrico Michelino Messalli[1]

[1]Department of Woman, Child and General and Specialized Surgery, Second University of Naples, Naples, Italy
[2]Department of Surgical Pathology, ASL NA1, Naples, Italy
[3]Department of Anatomic Pathology and Cytopathology, University of Naples "Federico II", Naples, Italy

ÖZ

Vajinal anjiyomatöz, kadın genital sisteminde çok nadir olan benign vasküler tümör oluşumunun bir parçası olarak düşünülmektedir. Bu tümörlerin insidansı oldukça düşüktür. Bu hastalığın nadirliği ve ayırıcı özelliklerin eksikliği bir ayırıcı tanı problemi oluşturmaktadır. Bu çalışmada 3.evre uterin prolapsusu ve kanayan vajinal duvar kitlesi olan 51 yaşındaki bir bayan hasta vakası sunulmaktadır. Posterior vajinal duvarın en alt bölümünde hemorajik noktalarla birlikte morumsu renkte düzensiz yumuşak doku gözlendi. Hastaya vajinal duvar kitlesi eksizyonu ile birlikte kolpohisterektomi ameliyatı uygulandı. Cerrahi eksizyon küratifti ve hastanın takibinin 12.haftasında herhangi bir rekürans gözlenmedi. Çalışmamızın amacı nadir fakat örnek bir vaka sunmaktır. Bu çalışmanın bu durumla ilgili farkındalık düzeyini artıracağını ve böylece benzer klinik vakaların ayırıcı tanısında hekimler tarafından akılda tutulacağını umuyoruz. Ayrıca çalışmamızda, anjiyomatozun kesin tanısı için yapılan patolojik muayenenin önemli rolü de vurgulanmaktadır.

Anahtar kelimeler: Anjiyomatoz, vajina, hemanjiyom tümör