

# Para-aortic lymphadenectomy: step by step surgical education video

İlker Selçuk<sup>1</sup>, Murat Öz<sup>1</sup>, Atahan Toyran<sup>1</sup>, İlkan Tatar<sup>2</sup>, Yaprak Engin-Üstün<sup>3</sup>, Deniz Demiryürek<sup>2</sup>

<sup>1</sup>Department of Gynecologic Oncology, University of Health Sciences Turkey, Ankara City Hospital Women's Health Training and Research Hospital, Ankara, Turkey

<sup>2</sup>Department of Anatomy, Hacettepe University Faculty of Medicine, Ankara, Turkey

<sup>3</sup>Department of Obstetrics and Gynecology, University of Health Sciences Turkey, Ankara Etlik Zübeyde Hanım Women's Health and Research Center, Ankara, Turkey

## Abstract

Para-aortic lymph nodes are exclusively important for the staging of gynecologic malignancies. This surgical education video describes the step-by-step technique for para-aortic lymphadenectomy with anatomic landmarks in a cadaver.

**Keywords:** Anatomy, surgery, education, lymphadenectomy, cancer

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## Introduction

Para-aortic lymph nodes are exclusively important for the staging of gynecologic malignancies. Uterine fundal, ovarian, and tubal lymphatics and pelvic lymphatic drainage eventually drain into the para-aortic lymph nodes (1). Lumbar lymph nodes around the aorta and inferior vena cava are classified as para-aortic lymph nodes. Para-aortic lymph nodes could also be divided into four zones clinically; high para-aortic and low para-aortic (also called the lateral aortic nodes), precaval-interaortocaval-preaortic and lateral caval (Figure 1) (2).

### Boundaries of para-aortic lymphadenectomy (Figure 2) (3):

**Right:** Right psoas major muscle, ascending colon, right ureter.

**Left:** Mesentery of descending colon and sigmoid colon, inferior mesenteric vein (IMV), left ureter.

**Caudal:** Mid common iliac level, below the aortic bifurcation.

**Cranial:** Left renal vein.

**Posterior:** Anterior longitudinal ligament.

### Anatomic landmarks and step-by-step technique for para-aortic lymphadenectomy

- Small intestines are packed craniolaterally and mesentery of sigmoid colon is retracted caudolaterally.

- Posterior parietal peritoneum is cut from the level of ileocolic junction to the level of ligament of Treitz.

- Paracaval space is developed; right ovarian vessels and right ureter are identified.

- Horizontal part of duodenum is mobilized and retracted superiorly. Left renal vein is identified.

- The areolar tissue between the left common iliac artery and mesentery of sigmoid colon is opened, in the process the left ureter and inferior mesenteric artery are identified.

- The para-aortic lymph node dissection begins over the right common iliac artery from the mid-level, caudad to cephalad direction. Clinical tip: Here, the superior hypogastric plexus which is anterior to the aortic bifurcation and left common iliac vein at the superior part of the precaval space is dissected and preserved if possible.

- Precaval and preaortic lymph nodes are dissected to the level of left renal vein. Lateral caval lymph nodes will be dissected within the precaval lymph nodes. Clinical tip: While dissecting the precaval lymph nodes, the tributaries of inferior vena cava towards the lymphatic tissue called "fellow's vein" should be carefully dissected and ligated to prevent a hemorrhage or injury.

- Lateral aortic lymph nodes are dissected from the infra-mesenteric region, below the level of inferior mesenteric artery.



*This video presentation will demonstrate the basic surgical steps of para-aortic lymphadenectomy for fellow gynaecological oncologists and gynaecologists, with a detailed view of anatomical landmarks to improve the surgical education.*

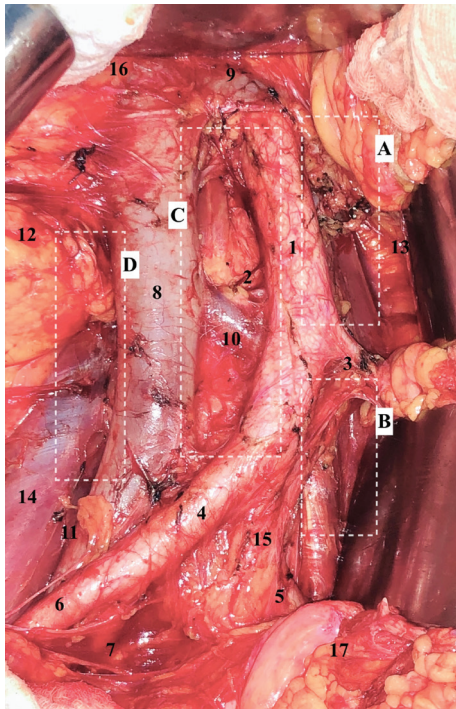
**Address for Correspondence:** İlker Selçuk

*e.mail:* ilkerselcukmd@hotmail.com ORCID: [orcid.org/0000-0003-0499-5722](https://orcid.org/0000-0003-0499-5722)

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**Figure 1.** Para-aortic lymph node zones; A. Supramesenteric lateral aortic nodes, B. Inframesenteric lateral aortic nodes, C. Inter-aortocaval nodes, D. Lateral caval nodes

1. Aorta, 2. Lumbar artery, 3. Inferior mesenteric artery, 4. Right common iliac artery, 5. Left common iliac artery, 6. Right external iliac artery, 7. Right internal iliac artery, 8. Inferior vena cava, 9. Left renal vein, 10. Lumbar vein, 11. Right common iliac vein, 12,13. Retracted peri renal adipose tissue, 14. Psoas major muscle, 15. Radiating fibers of superior hypogastric plexus, 16. Retracted duodenum, 17. Retracted sigmoid colon

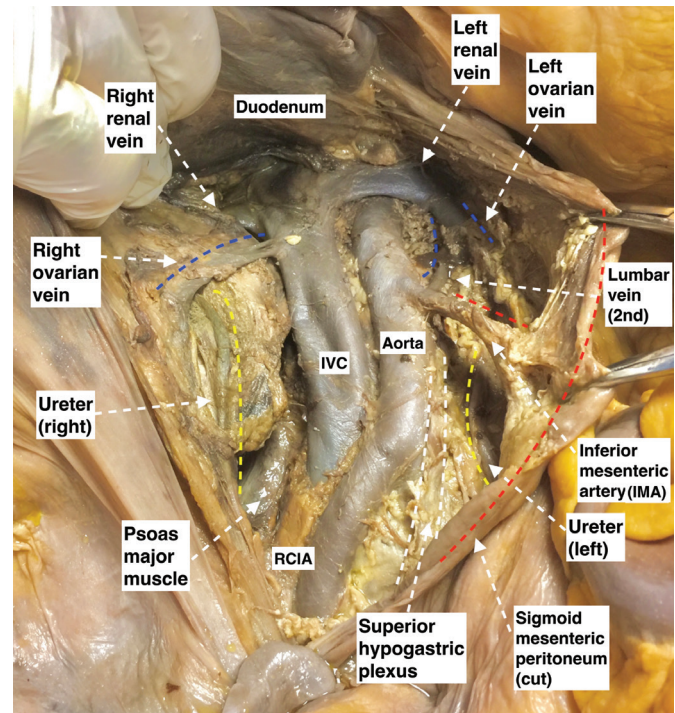
- Lateral aortic lymph nodes, cranial to the level of inferior mesenteric artery, are identified by sharp and blunt dissection from the mesentery of the descending and sigmoid colon and underlying left Gerota's fascia.
- Lateral aortic lymph nodes are dissected from the supra-mesenteric region, between the inferior mesenteric artery and left renal vein.

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#### Video 1.



<https://www.doi.org/10.4274/jtga.galenos.2019.2019.0117.video1>



**Figure 2.** Relevant anatomic landmarks of para-aortic lymphadenectomy on cadaver.

IVC: Inferior vena cava, IMA: Inferior mesenteric artery, RCIA: Right common iliac artery

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

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