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SURGICAL TECHNIQUE

Surgical technique: External iliac (or ilio-obturator) lymph node dissection via laparotomy



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Introduction

The external iliac lymphatic chain is the initial lymph node pathway station for cancer cell metastases from gynecological cancer. Consequently, external iliac lymph node dissection (EILND) is indicated in several carcinologic settings.

For **cervical cancer**, pelvic lymph node staging requires EILND or sentinel lymph node (SLN) biopsy via laparoscopy, usually associated with frozen section pathology examination, for early stage disease: I-A (with emboli) to I-B1 [1]. If the SLN biopsy is negative, an extended hysterectomy is indicated. If the SLN biopsy is positive, lumbo-aortic lymph node dissection (LALND) is performed, usually via laparoscopy without hysterectomy. Thus, management is akin to that for locally advanced cancer. For locally advanced stages: I-B2 to IV-A), laparoscopic lumbo-aortic staging without EILND is indicated through a trans- or retroperitoneal approach, before concomitant radio-chemotherapy. EILND is performed only if there is bulky lymphadenopathy, with the goal of improving the outcome of subsequent radiation therapy.

For **endometrial cancer** [2], three prognostic groups have been defined based on pre-operative findings. For “low risk” cancers (endometrioid grades 1–2, stage I-A), EILND is not recommended. For “intermediate risk” cancers (endometrioid grade 3, stage I-A, grades 1-2, and stage I-B), experienced groups perform SLN biopsy. LALND without EILND is performed if the SLN is positive. Lastly, for “high risk” cancers (endometrioid grade 3, stage I-B and stage \geq II and non-endometrioid cancer), LND is always indicated and associates SLN biopsy and EILND via laparoscopy or laparotomy.

In **vulvar cancer** [3], EILND is only rarely indicated.

Lastly, for **ovarian carcinoma** [4], EILND is theoretically indicated for all stages, and is performed according to the degree of resectability and operability of the patient. Laparoscopy is possible in early stage cancer [5–7]. In case of advanced stage (70% of ovarian cancers are stage IIIC at diagnosis), EILND and LALND are performed via laparotomy in association with cytoreduction of peritoneal tumor.

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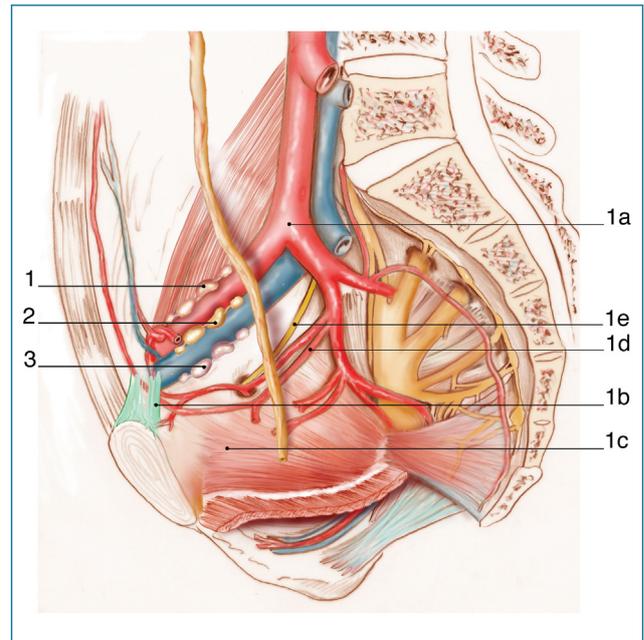
1 Regional anatomy

There are three external iliac lymph node groups:

- lateral: supra-arterial external iliac lymph node chain located between the psoas muscle and the external iliac artery (1);
- middle (inconstant): pre-venous external iliac lymph node chain between the external iliac artery and vein (2);
- medial: sub-venous external iliac lymph node chain located between the external iliac vein and obturator muscle (3).

The anatomic limits of lymph node dissection are:

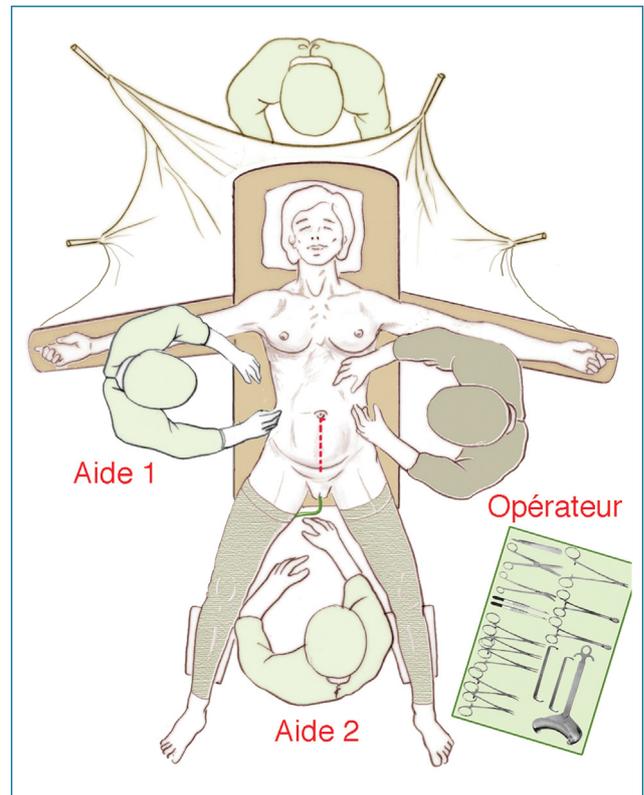
- superior: iliac bifurcation (1a);
- inferior: inguinal ligament or Cooper's ligament (1b);
- lateral: internal obturator muscle (1c);
- medial: umbilical artery (1d);
- deep: obturator nerve (1e).



2 Patient position and incision

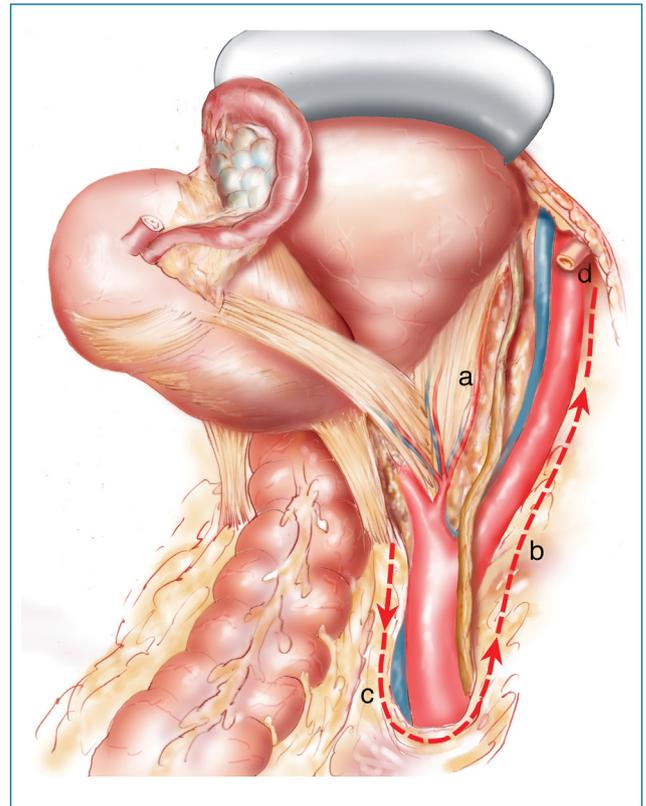
The patient is positioned supine, in slight Trendelenburg, with both arms extended and legs apart (double team approach). A bladder catheter is inserted.

A low midline (infra-umbilical) incision is made in the rare circumstances where EILND alone is performed. Otherwise, the midline incision is supra and infra-umbilical (cytoreductive surgery or associated LALND).



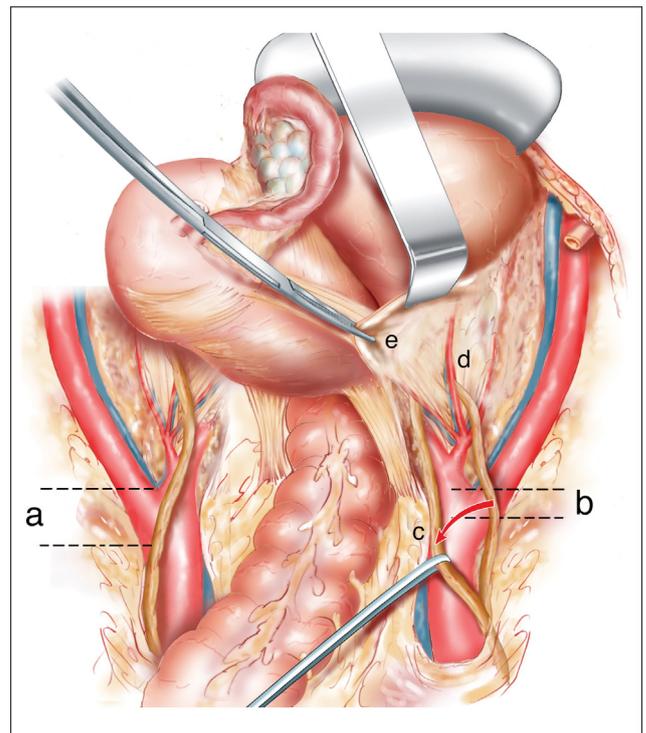
3 Peritoneal approach

The umbilical artery is identified first (a). The peritoneum is incised laterally between the lumbo-ovarian pedicle and the external iliac vessels (b), extending from the paracolic gutter (c) to the round ligament of the uterus, which is then divided (d).



4 Ureterolysis

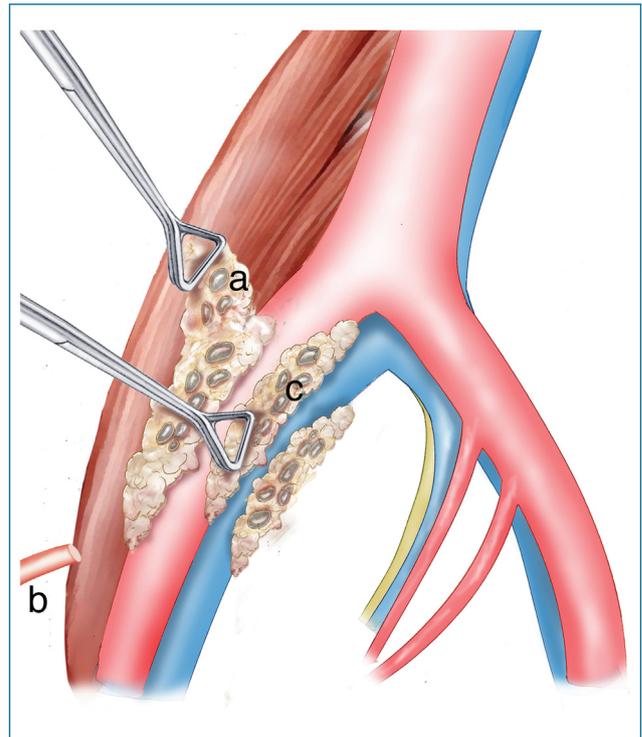
The ureter is identified at the level of the iliac artery bifurcation. The left ureter (a) usually crosses the external iliac artery at the level of the bifurcation whereas the right ureter (b) crosses the iliac artery slightly distal to the bifurcation. The ureter is then dissected free all along its pelvic course (c). A vascular tape placed around the ureter can help, but is by no means routinely necessary. The umbilical artery is then grasped and dissected up to its origin (d). Lymph node dissection is pursued by opening the paravesical space down to the levator ani muscles (e).



5 Excision of the supra-arterial and pre-venous chain

To accomplish this, the sheath of the external iliac is grasped on its anterior aspect in order to delicately pull on the supra-arterial lymph node package (a). Dissection is pursued by skeletonization of the artery from its bifurcation to the origin of the previously divided round ligament (b).

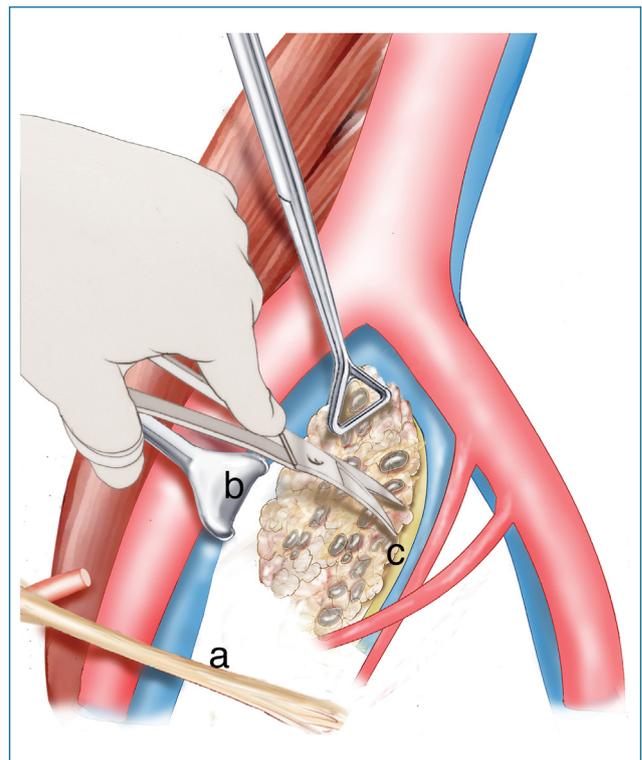
The dissection is continued along the lateral aspect of the external iliac artery posteriorly to the psoas muscle and also pursued in the space between the external iliac artery and vein, to extract the pre-venous lymphatic chain (c).



6 Dissection and excision of the infra-venous chain

Dissection is pursued along the medial aspect of the external iliac vein and then beneath the vein down to the internal obturator muscle laterally and the inguinal ligament inferiorly (a). A vein retractor is placed under the external iliac vein (b) to expose the sub-venous tissues and reach the lateral limit of the dissection at the level of the obturator muscle. The obturator nerve marks the deep extent of the dissection (c). Once all the elements have been identified, the lymphatic tissue is separated from its paravesical attachments and mobilized superiorly and anteriorly along the posteriorly-located obturator nerve up to the iliac bifurcation. This is performed with Dubost type scissors, opened just slightly, pushing the dissected lymph node package over the obturator nerve, by a bottom-to-top sweeping movement (likened to barber-style hair cutting).

External iliac lymph node dissection is then finished. Routine pelvic drainage is not recommended because this can enhance the onset or persistence of lymphoceles.



Contributing authors

Study conception and design: Rea Lo Dico.

Drafting and editing of manuscript: all authors.

Critical manuscript review and approval of final version: all authors.

Disclosure of interest

The authors declare that they have no competing interest.

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