



Original Article

Comparison Between Transperitoneal and Extraperitoneal Laparoscopic Para-aortic Lymphadenectomy in Gynecologic Malignancies

Cherif Akladios, PhD, MD*, Valentine Ronzino, MD, Stéphanie Schrot-Sanyan, MD, Karolina Afors, MD, Rodrigo Fernandes, MD, Jean Jacques Baldauf, MD, and Arnaud Wattiez, MD

From the Department of Obstetrics and Gynecology, Strasbourg University Hospital, Strasbourg, France (Drs. Akladios, Ronzino, Schrot-Sanyan, Baldauf, and Wattiez), and IRCAD: Institut de Recherche contre les Cancres de l'Appareil Digestif, Strasbourg, France (Drs. Afors, Fernandes, and Wattiez).

ABSTRACT **Study Objective:** Two validated laparoscopic approaches for para-aortic lymphadenectomy (PAL) exist: the transperitoneal and the extraperitoneal. The aim of this study was to compare the surgical outcomes of both approaches.

Design: A retrospective review of all patients who underwent laparoscopic PAL for a gynecologic malignancy between January 2008 and October 2013.

Setting: University Hospital.

Patients: Two patients groups were compared: transperitoneal (n = 51) and extraperitoneal (n = 21).

Interventions: Paraaortic lymphadenectomy.

Measurements and Main Results: The χ^2 test, Fisher's exact test, or Student's *t*-test were used for univariate analysis and a stepwise logistic regression for multivariate analysis. The threshold of statistical significance was set at 0.05. All patient characteristics were similar between the 2 groups ($p > .05$ for all variables). There was only 1 (1.3%) conversion to laparoscopy encountered in the transperitoneal PAL group and 3 conversions from extraperitoneal to transperitoneal PAL (14.2%). In 1 case of extraperitoneal PAL, the procedure was abandoned because of inadequate equipment (body mass index 48 kg/m²). The mean duration of surgery was longer in the transperitoneal group: 200 min (35–360) versus 125.6 min (45–180) in the extraperitoneal group ($p = .001$). The mean number of harvested lymph nodes was higher in the transperitoneal group: 17 (4–37) versus 13 (3–25) in the extraperitoneal group ($p = .029$). There was no difference in postoperative course and complications between both groups in multivariate analysis.

Conclusions: In nonobese patients, the extraperitoneal PAL is associated with shorter surgical duration, whereas the transperitoneal approach was associated with a higher number of harvested lymph nodes. As a result of improved ergonomics, the transperitoneal approach enables laparoscopic management of operative complications. *Journal of Minimally Invasive Gynecology* (2014) ■, ■–■ © 2014 AAGL. All rights reserved.

Keywords: Extraperitoneal; Gynecologic malignancy; Para-aortic lymphadenectomy; Transperitoneal

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All of the authors have no conflicts of interest or financial ties to disclose. Corresponding author: Dr. Cherif Akladios, MD, PhD, Department of Obstetrics and Gynecology, Strasbourg University Hospital, Hôpital de Haute-pierre, 1 avenue Molière, 67000 Strasbourg, France. E-mail: cherif.akladios@gmail.com

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Para-aortic lymphadenectomy (PAL) plays an important role in the surgical management of different gynecologic malignancies. It is important in pretherapeutic surgical staging for locally advanced cervical cancer, because the presence of para-aortic disease precludes the need for radiotherapy to be extended up to the para-aortic area [1]. It also plays a significant role in lymph node staging for high risk or

type 2 endometrial cancers [2] and for the detection of early stage ovarian cancers [3].

The optimum surgical technique for lymph node sampling is one that permits rapid recovery, which leads to prompt commencement of adjuvant therapy, if indicated. With the development and refinement of laparoscopic surgery, the effectiveness of PAL in the management of gynecologic cancers has been well documented [4–6]. Furthermore, a laparoscopic surgical approach has been proven effective in minimizing operative morbidity, and reducing hospital stay and subsequent recovery, with comparable surgical and oncologic outcomes to laparotomy procedures. Two validated approaches for laparoscopic PAL exist: the transperitoneal approach [7] and the extraperitoneal approach [8]. The question that now remains to be answered is no longer laparotomy versus laparoscopy, but is now which of these approaches should be adopted for specific clinical cases. From a technical standpoint, both the transperitoneal and extraperitoneal approaches have benefits and limitations that may preclude the use of 1 technique over the other for the management of certain cases and pathologies.

The aim of this study was to determine surgical outcomes and complication rates for each approach, as well as the specific benefits and limitations for both the transperitoneal and extraperitoneal approaches for laparoscopic PAL.

Material and Methods

This retrospective study was conducted at the University Hospitals of Strasbourg (Department of Obstetrics and Gynecology, Haute-pierre), France, after declaration to the National Committee for Computing and Liberties (French Data Protection Agency).

Patients

We included all patients who underwent a laparoscopic PAL between January 2008 and October 2013. The data included a continuous series of laparoscopic transperitoneal and extraperitoneal PAL cases operated on in the Department of Obstetrics and Gynecology of Strasbourg University Hospital. Traditionally, the transperitoneal approach was performed. However, in November 2008, the extraperitoneal procedure was introduced. There were no objective criteria for selecting one technique over the other. The gynecologic cancer committee of the institute determined the surgical indication. All patients' files were reviewed for data collection purposes.

Indications

In the endometrial cancer group, PAL was recommended in those patients at high risk of recurrence, as outlined in the recommendations of the French National Institute of Cancer INCa [2].

In the cervical cancer group, PAL was recommended for locally advanced tumors (stages 1B2 or more) whether before or after neoadjuvant surgery. In the ovarian cancer group, PAL was indicated in all cases, except for the stage 1A mucinous type and in advanced stage disease in which it was not possible to achieve complete intraperitoneal cytoreductive surgery after neoadjuvant chemotherapy.

Surgical Techniques

Transperitoneal Para-Aortic Lymphadenectomy

Patients are placed in a supine position, and a 10-mm, mid-line supraumbilical trocar is placed midway between the umbilicus and the xyphoid process. After exploration of the abdominal cavity, 2 additional 5-mm trocars are inserted into the paraumbilical region bilaterally. A fourth trocar is inserted 1 fingerbreadth below the umbilicus, and another 10- to 12-mm trocar is placed in the suprapubic area.

Following placement of the trocars, the patient is placed in the Trendelenburg position with a slight right tilt. The procedure commences by opening up the posterior peritoneum at the level of the right common iliac artery after identification of the right ureter. The incision extends over a length of approximately 10 cm along the anterior aspect of the aorta. The peritoneum is freed on either side and suspended to the anterior abdominal wall using either a T-lift device or endoscopic sutures (VECTEC, BioParc-Vichy, Hauterive, France). After identification of essential landmarks, notably the ureters bilaterally and the inferior mesenteric artery, the lymphadenectomy is performed from the bifurcation of the aorta until the level of the inferior mesenteric artery. The operator is then repositioned between the legs of the patient, and the procedure continues by freeing the peritoneum until the level of the renal vein and subsequent suspension to the anterior abdominal wall by either another 2 T-lift devices or endoscopic sutures. Lymphadenectomy is then continued until the level of the renal vein medial to the ureters on each side.

Extraperitoneal Para-Aortic Lymphadenectomy

The patient is placed in a dorsal decubitus position. The procedure begins with a standard transperitoneal laparoscopy, by placing a 10-mm umbilical trocar to allow inspection and elimination of intra-abdominal carcinomatosis. A 12-mm incision is then made 2 to 3 cm above and medial to the left anterior iliac spine in the mid-clavicular line, and the surgeon uses an index finger to open the space between the peritoneum and the muscles of the abdominal wall. A 12-mm, balloon-tipped trocar is then inserted and used to visualize the extraperitoneal space.

Carbon dioxide is used to insufflate the extraperitoneal space to a maximum of 12 mm Hg. Another 10- to 12-mm trocar with a 5-mm reducer cap is placed in the left flank in the mid-axillary line, and a 5-mm trocar is placed in the left subcostal area, in the external clavicular line. After

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