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Instruments and Techniques

Robotic Retroperitoneal Paraaortic Lymphadenectomy at Donostia University Hospital

Mikel Gorostidi, MD*, Joana Larreategui, Teresa Bernal, MD, Constance Goiri, MD, Miren Arrue, PhD, Pepe Navarrina, PhD, and Arantxa Lekuona, MD

Department of Obstetrics and Gynecology, Hospital Donostia, Sebastian, Spain (all authors).

ABSTRACT The purpose of this study was to describe our robotic retroperitoneal para-aortic lymphadenectomy technique and its associated outcomes as well as the advantages and disadvantages. We prospectively collected data on all retroperitoneal aortocaval lymphadenectomy procedures performed at Donostia University Hospital from December 2011 to April 2013 using the da Vinci S robotic system (Intuitive Surgical, Sunnyvale,CA). A total of 13 of these procedures were performed. The mean patient age was 60.3 years (SD, 10.18). Most patients were obese with a mean body mass index of 31.95 kg/m^2 (SD, 5), and 9 had endometrial cancer. Five individuals were restaged: 4 because of lymphovascular space invasion and 1 because of lymphovascular space invasion with G3 histology. There were 2 cases of Fédération Internationale de Gynécologie et d'Obstétrique stage IB endometrial cancer: 1 of papillary serous histology and 1 of G3. Two patients had advanced cervical cancer, and 2 had early-stage ovarian cancer. The median para-aortic lymph node yield was 12 (range, 4–21). In 3 patients, it was necessary to convert the procedure to transperitoneal access because of technical difficulties; 1 of these required laparotomy. The mean surgical time was 323 minutes (SD, 58) although this included additional complex procedures. Robotic para-aortic retroperitoneal lymphadenectomy is feasible and offers the advantages of retroperitoneal access. Journal of Minimally Invasive Gynecology (2014) 21, 480–485 © 2014 AAGL. All rights reserved.

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Para-aortic lymphadenectomy is required for surgical staging of endometrial and ovarian cancer, aiding in the selection of patients who will benefit from adjuvant treatments. In the case of advanced cervical cancer, the presence of lymph node metastasis in the upper abdomen is an indication for the expansion of the radiotherapy field. Although Fédération Internationale de Gynécologie et d'Obstétrique clinical staging does not take lymph node status into account, it is an essential part of most treatment protocols. Modern imaging techniques have their limitations; the false-negative rate of positron emission tomography computed tomography has been reported to be as high as 22% [1]. Therefore, surgical staging including para-aortic lymphadenectomy is recommended by many prestigious gynecologic oncology centers.

Retroperitoneal access to para-aortic lymph nodes was initially described in the 1970s [2] as an alternative to open transperitoneal lymphadenectomy. However, it was abandoned until the end of the 1990s when Dargent et al [3] described their extraperitoneal laparoscopic technique. The objective of this study was to describe our retroperitoneal para-aortic lymphadenectomy technique and its associated outcomes as well as the advantages and disadvantages.

Materials and Methods

We prospectively collected data on patients with endometrial, ovarian, and cervical cancer undergoing robotic

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Corresponding author: Mikel Gorostidi, MD, Department of Obstetrics and Gynecology, Hospital Donostia, c/Usandizaga 18-6° Izda, San, Sebastian 20002, Spain.
E-mail: mgorostidi@sego.es

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retroperitoneal para-aortic lymphadenectomies at Donostia University Hospital, Sebastian, Spain. A single surgeon experienced in laparoscopic oncologic procedures performed a total of 13 retroperitoneal para-aortic lymphadenectomies between November 2011 and April 2013 using the da Vinci S System (Intuitive Surgical, Sunnyvale, CA).

The surgical time was measured from the beginning of docking to skin closure, and we did not record the individual times for each different procedure. Details of any surgical complications and incidents during surgery were recorded as were the following other data: patient age, height, number of lymph nodes removed, blood loss, type of cancer and pathological characteristics, Fédération Internationale de Gynécologie et d'Obstétrique stage, and robot position. After discharge, all patients continued treatment in our hospital's gynecologic oncology unit with the first follow-up visit 3 weeks postoperatively. All patients regularly attended their follow-up visits.

Our surgical technique is as follows. The patient is placed with the left arm extended at an angle as in classic laparoscopy. If a pelvic transperitoneal procedure is planned, the left arm is tucked at the patient's side.

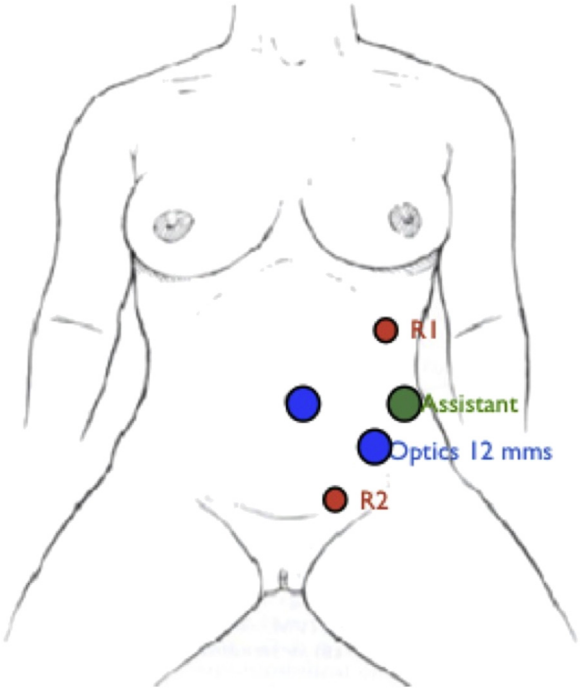
The procedure begins with a transperitoneal inspection of the abdominal cavity through a 10-mm umbilical trocar to rule out peritoneal dissemination. The trocars are placed in a manner similar to that described by Dargent et al [3]. A 2-cm incision is made 2 cm medial to the anterior superior iliac spine at the left McBurney point. This will be the optic port. Blunt dissection of the subcutaneous tissue is performed as far as the major oblique muscle fascia, which is opened with sharp dissection. The minor oblique and transverse muscle fibers are separated without damaging the peritoneum. The surgeon inserts his/her left index finger to expand the retroperitoneal space, reaching the psoas major muscle and the external iliac artery. We determine the trocar placement points with the objective of spacing the robotic arms as far apart as possible to avoid collisions. The assistant's 10-mm trocar is inserted in the midaxillary line at the level of the umbilicus or slightly lower guided by the surgeon's retroperitoneal finger.

An 8-mm robotic trocar (R2) is placed about 8 cm caudally to the initial incision medially toward the pubic bone, also under finger guidance. At this point, we begin passing an insufflation gas via the assistant's trocar, through which we also insert the camera. The retroperitoneal space is inspected visually, the finger is removed from the initial McBurney incision, and a balloon trocar is placed. Henceforth, this will be referred to as the optic trocar. We place the 8-mm R1 robotic trocar under visual guidance after dissecting the area with a conventional laparoscopic grasper, approximately 2 fingerbreadths under the last rib, on the anterior axillary line (Figs. 1 and 2). We place the da Vinci S system on the right side of the patient.

All procedures are performed using bipolar forceps in R2 (left hand) and monopolar scissors in R1. A 0° camera is used for the aortic and left aortic nodes. In the event of difficulties, a 30° camera can be used for interaortocaval and precaval dissection.

Fig. 1

Robotic trocars disposition. Blue: 12 mms trocar por transperitoneal and retroperitoneal optics. Red: 8 mmss trocar for robotic arms. Green: 10 mms trocar for assistant.



In all cases, a retroperitoneal infrarenal para-aortic lymphadenectomy was performed, conserving the inferior mesenteric artery. If transperitoneal access to the pelvis was required after complete para-aortic lymphadenectomy for more pelvic surgical procedures (hysterectomy, pelvic lymphadenectomy, and so on), we repositioned the da Vinci system for classic pelvic docking. We added a single 8-mm

Fig. 2

Robotic trocars disposition.