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Total laparoscopic radical hysterectomy and lymphadenectomy: The M. D. Anderson Cancer Center Experience

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Abstract

Objective. To retrospectively evaluate the feasibility and morbidity of total laparoscopic radical hysterectomy and lymphadenectomy.

Methods. We performed a retrospective review of all patients who underwent a total laparoscopic radical hysterectomy at our institution between May 2004 and August 2005. Data collected included age, body mass index, stage, histopathologic subtype, tumor grade, estimated blood loss, perioperative blood transfusions, number and status of lymph nodes obtained, status of surgical margins, length of hospital stay, time to resumption of normal bladder function, intraoperative and postoperative complications, and disease-free interval.

Results. Twenty patients underwent total laparoscopic radical hysterectomy during the study period. None of the surgeries required conversion to laparotomy. The median patient age was 41.5 years (range, 25–76). Eighteen patients had cervix cancer (5 stage IA2 and 13 stage IB1), and 2 had endometrial cancer (1 stage IB and 1 stage IIIA). Among those with cervix cancer, 12 had adenocarcinoma, 4 squamous cell carcinoma, and 2 adenosquamous carcinoma. The median weight was 70 kg (range, 49–112). The median number of resected pelvic lymph nodes was 13 (range, 9–26). One patient had nodal disease. The surgical margins were free of disease in all cases. The median blood loss was 200 ml (range, 25–700 ml). Only 1 patient required an intraoperative blood transfusion (1 U packed red blood cells). The median length of hospital stay was 1 day (range, 1–5). There were 3 short-term complications—unintentional cystotomy, pulmonary embolus, and pneumomediastinum with subcutaneous emphysema. There were 2 long-term complications—vaginal eviscerations and a lymphocyst. The median time to resumption of normal bladder function was 16 days (range, 13–29). The median follow-up time was 8 months range (1–16). All patients remain free of disease at the time of this report.

Conclusions. Total laparoscopic radical hysterectomy can be performed safely with minimal blood loss and postoperative morbidity, and patients undergoing this procedure may be discharged after an overnight stay in the hospital.

Keywords: Total laparoscopic hysterectomy

Introduction

Total laparoscopic radical hysterectomy was described initially by Canis et al. [1] and Nezhat et al. [2]. Since those initial reports, a number of other groups have published their experiences showing the feasibility and safety of this procedure [3–8]. These experiences have also suggested that performing the procedure laparoscopically does not adversely affect the patient's overall prognosis and survival [3–8]. Nevertheless, few long-term data are available on the morbidity of laparoscopic radical hysterectomy and survival after this procedure.

The purpose of this study was to evaluate the feasibility and morbidity of total laparoscopic radical hysterectomy performed at The University of Texas M. D. Anderson Cancer.

Materials and methods

The medical records of all patients who underwent total laparoscopic radical hysterectomy and lymphadenectomy at M.D. Anderson Cancer Center between May 2004 and August 2005 were reviewed. Institutional Review Board approval was obtained. Data were obtained from medical and pathologic records. All patients entered on the study had their initial pathologic diagnosis confirmed at our institution.

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The patient characteristics retrieved were age, body mass index, stage of disease according to the International Federation of Gynecology and Obstetrics, histopathologic subtype, and tumor grade. Intraoperative parameters evaluated included intraoperative complications, blood loss, perioperative blood transfusions, and number of pelvic lymph nodes removed. Blood loss was defined as the total volume of suctioned fluids minus the volumes of irrigation fluids used at the completion of surgery. Postoperative parameters evaluated included short-term postoperative complications (within 30 days of the procedure), long-term postoperative complications (more than 30 days after the procedure), postoperative therapy, status of the surgical margins, status of lymph nodes removed, length of hospitalization, time to recovery of normal bladder function, presence of either permanent or prolonged bladder dysfunction, median follow-up duration, recurrence, and disease-free interval.

Patients did not undergo specific postoperative urologic evaluations other than measurement of residual urine volume after a trial of voiding. All patients were discharged with an indwelling catheter. The catheter was left in place for a minimum of 2 weeks after surgery. Patients were instructed to return 2 weeks after surgery for a voiding trial. If bladder function at that time was adequate, defined as a postvoid residual urine volume of less than 100 ml, the urinary catheter was removed. All patients were treated with prophylactic antibiotics until the catheter was removed. Patients did not undergo routine postoperative imaging evaluation for detection of lymphocysts. Imaging evaluation was performed only in patients who were symptomatic or whom had an abnormality noted on routine pelvic examination.

Patients were not considered candidates for the laparoscopic approach when any of the following criteria were present: obvious metastases beyond the uterus (as detected by routine chest X-ray and computed tomography scan of the abdomen and pelvis); cervical tumor size >4 cms; inadequate bone marrow, renal, or hepatic function; pregnancy; bulky uterus (equivalent to size at greater than 12 cm or such that vaginal removal of the uterus might require morcellation); or severe hip disease precluding the use of the dorsolithotomy position. Neither high body weight nor previous abdominal surgery was considered a contraindication for the laparoscopic approach.

Surgical technique

At our center, total laparoscopic radical hysterectomy (Rutledge Classification Type III) is currently performed using a modified vaginal ring that is attached to the uterine manipulator. This allows for excellent resection with ease and precise removal of a 2-cm upper vaginal margin with maintenance of adequate pneumoperitoneum. This instrument is placed before the procedure is started. Generally, the patient's arms are tucked at her side. The patient is placed in a steep Trendelenburg position. A 10-mm bladeless trocar that incorporates the 0° laparoscope is placed at the level of the umbilicus, and entrance into the abdominal cavity is made under direct visualization. In patients with a prior midline incision, the initial entry into the abdominal cavity is made approximately 2 cm below the left costal margin at the level of the midclavicular line. This latter approach is performed to avoid injury to bowel adherent to the anterior abdominal wall. Once the trocar has been safely introduced into the abdominal cavity, insufflation is performed. The intraabdominal pressure is maintained at 16 mm Hg. Two additional 10-mm bladeless trocars are placed in the right and left lower quadrants. One additional 5-mm bladeless trocar is inserted in the midline above the pubic symphysis. The bowel is mobilized to the upper abdomen. The round ligaments are transected bilaterally. An incision is made in the peritoneum to assess the retroperitoneum over the psoas muscle immediately lateral to the infundibulopelvic ligament. The infundibulopelvic ligament is retracted medially to identify the ureter. The paravesical and pararectal spaces are identified. The uterine vessels are identified bilaterally at their point of origin from the internal iliac artery and vein. If a bilateral salpingo-oophorectomy is being performed, the infundibulopelvic ligament is transected.

The uterine vessels are transected at the point of origin from the internal iliac vessels using the Ligasure Atlas vessel sealant device (ValleyLab, Boulder, CO). The uterine artery and vein are transected avoiding the need to isolate these vessels individually. The bladder is then mobilized inferiorly using the ProbePlus monopolar instrument (Ethicon Endosurgical, Cincinnati, OH). Using the same instrument, the ureters are separated from their medial attachments to the peritoneum. The parametrial tissue over the ureters is dissected after it is transected, and the ureters are unroofed to the point of insertion into the bladder bilaterally. The lateral aspect of the vesicouterine ligament is divided. The bladder is then mobilized further inferiorly to ensure adequate vaginal margins.

At this time, the posterior peritoneum is incised using the ProbePlus monopolar instrument, and the rectovaginal space is entered. The uterosacral ligaments are identified, isolated, and transected bilaterally using the Ligasure Atlas vessel sealant device. The uterosacral ligaments are transected as close to the pelvic sidewall as possible. The vaginal occluder is insufflated to allow for maintenance of the pneumoperitoneum. The modified vaginal ring is identified by placing upward pressure on the uterine manipulator. The ProbePlus monopolar instrument is used to make a circumferential incision on the ring. The specimen is completely separated from the upper vagina and removed while it is attached to the modified vaginal ring and uterine manipulator. The vaginal cuff is sutured laparoscopically.

A pelvic lymphadenectomy is then performed from the level of the aortic bifurcation along the external iliac vessels to the circumflex iliac vein. Internal iliac lymph nodes are then removed. The obturator lymph nodes are removed separately, with care taken to identify the obturator nerve and avoid injuring it. Para-aortic lymphadenectomy is not routinely performed unless suspicious pelvic lymph nodes are confirmed to have metastatic disease on frozen section evaluation. This is done in order to determine the field of radiation.

To minimize the risk of port site metastases, the abdominal cavity is deflated prior to removal of the ports, and all port sites are irrigated with 5% povidine–iodine solution prior to completion of the surgery.

Results

Twenty patients underwent total laparoscopic radical hysterectomy at M. D. Anderson between May 2004 and August 2005. None of the surgeries required conversion to a laparotomy. No procedures were aborted secondary to evidence of microscopically or macroscopically positive lymph nodes or extracervical disease. Four patients underwent lymphatic mapping and sentinel node biopsy.

The median patient age was 41.5 years (range, 25–76). Eighteen patients had cervix cancer (5 had stage IA2 and 13 stage IB1 disease), and 2 had endometrial cancer (1 had stage IB and 1 stage IIIA disease). Among the patients with cervix cancer, 12 had adenocarcinoma, 4 had squamous cell carcinoma, and 2 had adenosquamous carcinoma. The reason for radical hysterectomy in the 2 patients with endometrial cancer was that these patients had evidence of adenocarcinoma on both endometrial biopsy and endocervical curettage, and magnetic resonance imaging could not resolve whether the site of origin of the disease was cervix or endometrium.

The median patient weight was 70 kg (range, 49–112), and the median body mass index was 26 kg/m^2 (range, 18.4–45.2). The median number of resected pelvic lymph nodes was 13 (range, 9–26). One patient had metastases to one parametrial lymph node and one obturator sentinel node. The metastases were detected on serial sectioning evaluation. The surgical margins were free of disease in all cases. The median blood loss was 200 ml (range, 25–700 ml). Only 1 patient required an intraoperative blood transfusion (1 U packed red blood cells). One patient received 2 U of packed red blood cells postoperatively. The median operative time was 332.5 min (range, 275–442) for all cases. However, in nine cases, there were other procedures performed that extended the median operative time. The additional procedures performed included lymphatic mapping, frozen cold-knife cone, and ovarian