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Total laparoscopic hysterectomy with and without lymph node dissection for uterine neoplasia

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KEYWORDS:
Total laparoscopic hysterectomy;
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Abstract

STUDY OBJECTIVE: To compare surgical outcomes of patients with uterine neoplasia undergoing total laparoscopic hysterectomy only (TLH) with those having TLH and lymph node dissection (TLHND) from September 5, 1996 through January 13, 2007.

DESIGN: Retrospective chart analysis (Canadian Task Force classification II-2).

SETTING: Three tertiary surgical centers in California.

PATIENTS: 112 patients with uterine neoplasia operated on from 1996 through 2006.

INTERVENTIONS: All patients underwent total laparoscopic hysterectomy and bilateral salpingoophorectomy; however, 30 patients with FIGO stage IC or higher, lymph channel involvement, or grade 3 disease also underwent pelvic and aortic node dissection.

MEASUREMENTS AND MAIN RESULTS: Of 807 patients having TLH, 112 had a uterine neoplasia: twenty-one hyperplasia, 86 carcinoma, 2 ovarian and endometrial carcinoma, and 3 low-grade endometrial stromal sarcoma; 82 had TLH and adnexectomy; and 30 had TLHND. For both groups, the mean age was 60 (NS), Quatlet index was 31.2 (NS), parity was 1.6 (NS), and the mean blood loss was 148 mL (NS). The node dissection added 56 minutes to TLH (132 vs 188 minutes, $p < .001$) and yielded a mean of 25 nodes. Patients in both groups spent a median of 1 day in the hospital (NS). There were 7 complications (6.3%) in the series: among the patients in the TLH group, 1 conversion to laparotomy for bleeding from an ovarian artery, 1 vaginal rupture during coitus at 6 weeks, and 1 nonsurgical episode of diverticulitis. There were 4 patients in the TLHLND group with complications: 1 ureteral injury, 1 trocar-site hernia, 1 vaginal laceration, and 1 pelvic abscess.

CONCLUSIONS: Node dissection added 56 minutes and entailed no additional blood loss, transfusion, or length of hospital stay, as well as minimal risk of complication. Total laparoscopic hysterectomy with indicated lymph node dissections for endometrial disease is reasonably well tolerated and warrants prospective randomized study to document its role in the therapy of endometrial carcinoma.

Standard therapy for uterine neoplasia and hyperplasia has consisted of open laparotomy with hysterectomy and bilateral salpingo-oophorectomy, with pelvic and aortic lymph node dissection when indicated.[1] Recently, randomized trials comparing total abdominal hysterectomy with laparoscopic-assisted vaginal hysterectomy (LAVH) for benign indications revealed similar complications, less blood loss, longer operating times, fewer transfusions, less pain, and shorter hospital stay and disability with LAVH.[2–6] In 1992, studies of LAVH with indicated pelvic and aortic

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lymph node dissections for patients with endometrial carcinoma have confirmed its feasibility and safety[2,3]; however, LAVH can be difficult or impossible to perform for many nulliparous or obese patients. Yet obesity and nulliparity are common risk factors for uterine neoplasia, accounting for more than half of patients with endometrial cancer.[7,8] The total laparoscopic hysterectomy (TLH) has been described as potentially quicker, more efficient, and associated with less blood loss than LAVH[4] and is also more achievable in nulliparous and obese women.[9,10] There are no randomized, clinical trials of TLH for women with endometrial disease, as yet, and none evaluating the addition of node dissections to TLH.

This large cohort review is undertaken to serve as pilot data for a randomized trial, focusing on outcomes specifically related to the effects of adding node dissections to TLH in a cohort of women with endometrial neoplasia. In this retrospective report, the patient demographics, preoperative indications, surgical data, and complications are recorded and analyzed from a teaching practice, stratifying by whether a node dissection was performed.

Patients and methods

Retrospective study design

Of 807 cases of TLH performed, 112 cases of simple TLH were initiated for management of endometrial carcinoma, hyperplasia or low-grade endometrial stromal sarcoma (Table 1). In this practice, all patients undergoing hysterectomy are scheduled for a laparoscopic approach unless they have radiographic evidence of metastatic uterine carcinoma or prior operative reports documenting severe intestinal adhesions. All patients with grade 1 and 2 carcinomas had frozen section examination of their uteri for indications for lymph node dissection: cervical stromal invasion, deep myometrial invasion, higher grade, or lymphatic space invasion.[5] Pelvic and aortic nodes were dissected whenever patients had papillary[6] or grade 3 carcinoma. All surgeries were performed by 1 author (KAO'H), assisted by an obstetrics and gynecology resident or attending, or a general surgeon. By TLH, it is meant that all surgery was performed through the laparoscopic ports, including dissection around the cervix and closure of the vagina.[11] The hysterectomy procedure is described previously.[7] By lymph node dissection (TLHLND), it is meant that after the TLH, pelvic and aortic nodes were dissected when indicated. The dissection of the pelvic nodes extended from the genitofemoral nerve medially, from the crossing of the ureter inferiorly to the crossing of the deep circumflex ileac vein over the external ileac artery, posteriorly to the posterior aspect of the hypogastric artery and obturator nerve. The aortic nodes were dissected from the crossing of the ureter superiorly over the common iliac artery and vein, the vena cava and aorta on the right, and over the psoas muscle on the left, up to the ovarian artery. Blood loss was estimated by direct observation of the volumetric canister in which it was collected.

Data analysis

With Investigational Review Board approval maintained yearly at Sequoia Hospital in Redwood City, CA, the office and hospital charts were reviewed, and data were recorded anonymously. The data were analyzed on a JMP (SAS Institute, Cary, NC) statistical analysis package, using analysis of variance (ANOVA) and for comparison of continuous data, and χ^2 analyses including Fisher's exact test for nominal data. A value of $p < .05$ was accepted as significant. Mean and SD with CIs were reported to describe these normal distributions.

Results

Of 807 patients having TLH, 114 patients were identified with uterine neoplasia, and 2 were found to have widespread metastatic disease at initial placement of the laparoscope and were immediately converted to open laparotomy for completion of debulking and staging, leaving 112 for analysis.

In both groups, the mean age was 60 years (NS), with mean parity of 1.6 children (NS), ranging from 0 to 6. Overall, 35% of the women were nulligravid. In both groups, the mean Quatlet index was 30.4 (NS), ranging from 17.8 to 60.7. Fourteen women had a body mass index between 40 and 60.

Table 1 Demographic statistics

	TLH (n = 82)		TLHLND (n = 30)		
Patient demographics	Mean (SD)	95% CI	Mean (SD)	95% CI	ANOVA p
Age (yrs)	61.5 (12.1)	(58.9–64.1)	57.2 (14.4)	(52.1–62.3)	0.11
Parity	1.7 (1.6)	(1.3–2.1)	1.5 (1.4)	(.99–2.0)	0.5876
Body mass index	31.8 (10.2)	(29.6–33.9)	29.5 (7.2)	(26.9–32.1)	0.2662

TLH = total laparoscopic hysterectomy; TLHLND = lymph node dissection.

Table 2 Surgicopathological statistics

	TLH (n = 82)		TLHLND (n = 30)		
Surgical data	Mean (SD)	95% CI	Mean (SD)	95% CI	ANOVA p
Duration of surgery (min)	132.1 (46.1)	(122–142)	188.1 (56.8)	(167–208)	<.0001
Estimated blood loss (mL)	134 (213)	(88–180)	186 (235)	(101–270)	.264
Length of hospital stay (days)	1.6 (.9)	(1.4–1.8)	1.6 (1.4)	(1.1–2.1)	.8752
Uterine weight (g)	158 (117)	(130–185)	130 (61)	(107–152)	.2217
Number nodes obtained	—		25 (12.5)	(20–29)	—

TLH = total laparoscopic hysterectomy; TLHLND = lymph node dissection.

Surgery duration was obtained from the computerized hospital record and included the procedure time from surgical start to finish. The mean duration of surgery was 56 minutes longer for patients requiring node dissections (132.1 vs 188.1 minutes, p = .0001) (Table 2). Many patients had additional procedures (Table 3) performed in addition to the primary surgery, including 35 appendectomies, 5 omentectomies, 2 ureterolysis, and 2 colpocystopexies, 4 hernia repairs, and 8 uterosacral ligament plications. The specific times used for these other procedures were neither recorded nor subtracted from the total duration of the surgical procedure. Among patients having only hysterectomy/adnexectomy with no other procedure, operating time was less than 90 minutes for 16 patients (14%), and under 120 minutes for 35 patients (31%).

The estimated blood loss was 143 mL per case in both groups (NS), with 52 (46%) patients losing 50 mL or less and 77 (68%) losing less than 100 mL (Table 2). Three patients required transfusions of 2, 4, and 5 units of blood, respectively.

The mean hospital stay was 1.6 days for both groups (NS); the median hospital stay was 1 day. For the first 4 years of the study, patients were instructed that they would stay 2 days in the hospital, and they stayed 1.99 days. In comparison, patients in the latter half were counseled to expect that their discharge would be on postoperative day 1, and they stayed 1.05 days (p = .0001).

Table 3 Additional procedures

	TLH No. (%) (n = 82)	TLHLND No. (%) (n = 30)
Fulgurate endometriosis	2 (2.4)	0
Lysis of adhesions	6 (7.3)	0
Omentectomy	0	5 (17)
Uterosacral ligament plication	4 (5)	4 (13)
Burch/TOT	1 (1.2)	1 (.4)
Cystoscopy	25 (30)	20 (67)
Ureterolysis	0	2 (6)
Appendectomy	20 (25)	15 (50)
Herniorrhaphy	3 (3.6)	1 (.4)

TLH = total laparoscopic hysterectomy; TLHLND = lymph node dissection.

In both groups, the mean uterine weight was 150 g (NS). In 11 cases in which the enlarged uterus (>250 g) would not fit through the vagina, the uterus was placed inside a Lapsac (Cook Surgical, Chicago, IL) nylon surgical bag, which was then pulled open end first out through the vagina, allowing vaginal morcellation of the uterus inside the bag, with no intraperitoneal spillage. In most cases, the uterus required only a few incisions to permit removal from the vagina, such that the pathologists had no trouble reconstructing the uterus to assess depth of invasion, tumor location, and cervical invasion to give a thorough and accurate tissue report.

For 30 patients with a preoperative diagnosis of grade 3 histology, or whose frozen section revealed a tumor that was greater than 50%, invaded through the myometrial wall or lymph channels, a pelvic and aortic TLHLND was performed, yielding a mean of 25 nodes. Washings were positive in both of 2 patients with concurrent ovarian primaries, and 12 (14%) of 85 patients with uterine primaries. The staging based on the final pathologic diagnoses revealed: 30 with stage IA, 32 with stage 1 IB; 13 with stage IC, 1 with stage IIA, 4 with stage IIB, 2 with stage IIIA, 1 with stage IIIB, 7 with stage IIIC, 1 with stage IV, and 21 with only hyperplasia.

The overall complication rate for the series was 6.3%, with 3 patients in the TLH group having 1 conversion to open laparotomy for persistent bleeding from an ovarian artery, 1 vaginal rupture after coitus at 6 weeks healed with observation, and 1 nonsurgical episode of diverticulitis. Four patients in the TLHLND group had complications: 1 ureteral injury, 1 incarcerated hernia, 1 vaginal laceration, and 1 pelvic abscess. The first patient had a left ureter immediately adjacent to the left side of the aorta, which was excised with a 2-cm nodal bundle. The pathologist contacted the surgeon the next day, and confirmatory intravenous pyelography was performed. The patient underwent laparotomy, stenting, and successful anastomosis. The second patient had an incarcerated small bowel hernia develop through her right abdominal 5-mm trocar site and underwent mini-laparotomy at the trocar site with suture repair of the fascia and good recovery. Another patient had vaginal bleeding in the recovery room and was returned to the operating room for suture of a laceration. One patient had pelvic fluid collection and fever and underwent antibiotic

therapy and computed tomography–guided drainage with complete resolution.

Discussion

This report specifically addresses concerns about potential additional morbidity from adding a pelvic and aortic node dissection to a TLH in the treatment of women with endometrial disease. More than half of the patients had a body mass index greater than 30, and more than one-third were nulligravid, making LAVH or laparotomy more difficult and more fraught with complications. Most authors performing TLH on obese women report durations longer than 2 hours, as we observed, although many simple TLHs were completed in less than 90 minutes. The mean nodal yield of 25 suggests that patients received a thorough staging, not just a sampling.[8] Other authors have obtained 32 nodes laparoscopically with a retroperitoneal approach, which we now use,[12] with evidence of a learning curve of reduced operating times and higher nodal yields with greater experience,[9] which we observed also. Complication rates were similar to other reports of LAVH and nodes.[10] One serious complication, the ureteral injury, was directly attributed to the node dissection and has been reported by others.[10]

There are 2 major challenges to the interpretation of these data. The surgeries were performed over many years with evolving laparoscopic skills of the primary surgeon and use of a variety of assistants. Another concern in interpreting these data is that there were many additional procedures performed with the TLH or TLHLND, definitely contributing to length of the procedure, and possibly to the length of stay, blood loss and complications. Although such practice of multiple procedures during one anesthesia reflects the reality of a typical gynecologic oncology patient's needs for correction of pelvic floor dysfunction and other anomalous findings at surgery, randomized clinical study should be planned to control for recording only the operating times for the basic hysterectomy/adnexectomy/possible node dissection, excluding the times of all additional other procedures.

Conclusions

Total laparoscopic hysterectomy/adnexectomy with indicated lymphadenectomy is feasible and safe for patients with endometrial neoplasia. No significant differences were noted in blood loss or length of hospital stay when stratified by performance of the node dissection, which adds 56 minutes to the surgical time. Complication rates were within reason. This series highlights the clinical considerations essential to planning much-needed randomized trials of TLH with and without node dissection for women with endometrial neoplasia.

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