

Laparoscopic hysterectomy: The Kaiser Permanente San Diego experience

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KEYWORDS:

Laparoscopic hysterectomy;
Laparoscopic supracervical hysterectomy;
Total laparoscopic hysterectomy;
Hysterectomy

STUDY OBJECTIVE: To evaluate patient and surgical characteristics of laparoscopic hysterectomy (LH), including both total laparoscopic hysterectomy (TLH) and laparoscopic supracervical hysterectomy (LSH), compared with total abdominal hysterectomy (TAH).

DESIGN: Retrospective, comparative study (Canadian Task Force classification II-2).

SETTING: Health maintenance organization/residency-training program.

PATIENTS: One hundred eight patients who underwent TLH, 251 patients who underwent LSH, and 255 patients who underwent TAH. There was no randomized controlled system to assign patients to the three types of hysterectomy. Patients with ancillary procedures were excluded from all three groups. The study period included February 2000 through September 2002.

INTERVENTION: Hysterectomy.

MEASUREMENTS AND MAIN RESULTS: Analysis of covariance revealed that laparoscopic procedures require significantly more time to complete than TAH. Adjusted differences were 46.4 minutes longer for TLH ($p < .0001$) and 38.3 minutes longer for LSH ($p < .0001$). The adjusted estimated blood loss was 91.0 mL less with TLH ($p < .0001$) and 72.6 mL less with LSH ($p < .0001$) than with TAH. The hospital lengths of stay were significantly shorter for LH compared with TAH. The adjusted differences were 41.7 hours less with TLH ($p < .0001$) and 45.1 hours less with LSH ($p < .0001$). Rates of major complications were 5.6% with TLH, 0.8% with LSH, and 8.2% with TAH. Rates of minor complications were 17.6% with TLH, 16.7% with LSH, and 14.1% with TAH. Rates of any complication were 21.3% with TLH, 17.1% with LSH, and 20.8% with TAH. (Note: some patients in each group had both a minor and a major complication, so that minor and major complications do not exactly add up to "any complication.") The readmission rates for TLH, LSH, and TAH were 5.6%, 1.2%, and 2.0%, respectively. Same-day discharge for TLH and LSH occurred in 16.7% and 25.1% of patients, respectively. The variables indicating minor complications, any complications, wound infections, urinary tract infections, readmissions, and same-day discharges (in the laparoscopic groups) were not differentiated by surgery type. Major complications were differentiated by procedure class; namely,

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total hysterectomy (TLH and TAH) had significantly more major complications than LSH (adjusted $p = .001$). Wound abscesses (16 patients) occurred only in the TAH group (adjusted $p < .0001$). Pelvic cellulitis (17 patients) occurred in all surgical groups, but was more likely to occur in the LH groups (adjusted $p = .01$).

CONCLUSIONS: Laparoscopic hysterectomy, both total and supracervical, can be successfully integrated into a large health maintenance organization/residency-training program. Laparoscopic hysterectomy took significantly longer to perform than TAH in this new program. Estimated blood loss was significantly less with LH than with TAH. Hospital length of stay was significantly less with LH than TAH. Major complications with TLH, minor complications with LH, overall complications, wound infections, urinary tract infections, and readmissions appear comparable with these parameters in TAH within the limits of our study size and design. Pelvic cellulitis was significantly more common with LH, and wound abscess was significantly more common with TAH. Major complications were significantly less common with LSH compared with combined TLH and TAH. Same-day discharge after LH seems to be an attractive option worth developing further. Our patients have enthusiastically accepted these new minimally invasive techniques for performing hysterectomy. We anticipate continued expansion of our LH program.

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Pioneering centers have established laparoscopic-assisted vaginal hysterectomy (LAVH) and laparoscopic hysterectomy (LH) as legitimate techniques. Generally, these procedures have been performed by small groups of surgeons in specialty referral centers.¹⁻⁹ Reviews of the Finnish national experience^{10,11} and a series from a large teaching hospital in Taiwan¹² have documented the safety of the laparoscopic approach to hysterectomy within larger groups of surgeons.

This study describes the successful application of LH in the United States within a large medical group with a residency-training program. Kaiser Permanente is the largest and one of the oldest health maintenance organizations in the country, serving over 8 million members nationally and 500,000 members in San Diego, California. The obstetrics and gynecology department in San Diego consists of approximately 44 obstetrician/gynecologists, including eight subspecialists, all either diplomates or active candidates of the American Board of Obstetrics and Gynecology. Kaiser Permanente and the University of California, San Diego, jointly sponsor a fully accredited residency-training program in obstetrics and gynecology.

During this series, two surgeons (CPH and JK) served as a specialty team to coordinate the LH program. Most staff-level gynecologists participated in a formalized internal training rotation in LH. The house staff actively participated in both open and laparoscopic procedures.

We chose traditional total abdominal hysterectomy (TAH) as the benchmark procedure for comparison with LH. In our program, LH was designed to replace TAH whenever possible in order to avoid a large abdominal surgical incision and to improve patient comfort and speed of recovery. Laparoscopic hysterectomy was not designed to replace indicated total vaginal hysterectomy, which already avoids all abdominal incisions. Some surgeons in our department began performing LAVH in 1993 as an initial minimally invasive procedure. Laparoscopic hysterectomy has now almost completely replaced LAVH in our program. We like the simplicity of a single surgical field offered by LH.

Materials and methods

The Kaiser Permanente Southern California Institutional Review Board approved the study design and methods for the protection of study participants.

Patients

From February 2000 through September 2002, 359 women underwent laparoscopic supracervical hysterectomy (LSH) and total laparoscopic hysterectomy (TLH) without ancillary procedures. We selected 255 women who underwent traditional TAH without ancillary procedures during this same time period from a complete list of such patients using SPSS version 10.0 software (SPSS, Inc., Chicago, IL) to draw a random sample of 15% to serve as our comparison group. Women in all three groups underwent hysterectomy for standard indications, excluding malignant disease. Total laparoscopic hysterectomy and TAH groups also included patients who underwent simple hysterectomy for stage I endometrial cancer or premalignant cervical neoplasia, because we felt that these diagnoses should not affect the difficulty of the surgery. Patients undergoing procedures closely associated with the hysterectomy, or necessary to repair complications of the hysterectomy, such as dilation and curettage, adnexal procedures, lysis of adhesions, cystoscopy, and repair of cystotomy were included. We excluded patients with significant procedures performed in addition to the hysterectomy, such as pelvic reconstruction, anterior or posterior vaginal repair, urethropexy, appendectomy, cholecystectomy, and hernia repair. We believed that these other procedures could substantially affect the surgical characteristics and outcomes.

Patients undergoing LSH were required to have a normal endometrial sampling either by office endometrial biopsy or by dilation and curettage with frozen section at the time of the hysterectomy. Endometrial pathology and active cervical intraepithelial neoplasia were exclusions to having LSH. Patients with a history of cervical intraepithelial neoplasia

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