

# Laparoscopic Supracervical Hysterectomy Compared With Abdominal, Vaginal, and Laparoscopic Vaginal Hysterectomy in a Primary Care Hospital Setting

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## ABSTRACT

**Objective:** This study compares the operative parameters of laparoscopic supracervical hysterectomy, laparoscopically assisted vaginal hysterectomy, total vaginal hysterectomy, and total abdominal hysterectomy in patients in a small suburban medical center.

**Methods:** This investigation is a Canadian Classification II-2. It was performed in a 238 bed not-for-profit community general hospital. Charts of 117 patients were reviewed.

These patients had undergone the following procedures: laparoscopic supracervical hysterectomy, laparoscopically assisted vaginal hysterectomy, total vaginal hysterectomy, total abdominal hysterectomy; questionnaires completed by the patients were reviewed. All patients had hysterectomies performed by members of the Ob/Gyn department of Alamance Regional Medical Center.

Comparisons of intraoperative and postoperative events were made in those patients who consented to the study and who returned their questionnaires. Parameters compared were patient age, weight, preoperative diagnosis, operative time, operative complications, blood loss, uterine weight, length of stay, postoperative complications, return to hospital, return to work, resumption of intercourse, dyspareunia, and bowel or bladder problems.

**Results:** Patient demographics and outcomes are similar. Laparoscopic supracervical hysterectomy showed lower morbidity and quicker return to normal function, but most findings did not reach statistical significance.

**Conclusion:** The results support the conclusion that the

patients in each arm of the study are similar. The operative parameters show a longer operating time for the laparoscopic procedures than for total abdominal hysterectomy and total vaginal hysterectomy, respectively. The other indicators of morbidity show slight advantages of laparoscopic supracervical hysterectomy in blood loss, length of stay, and resumption of normal activities.

**Key Words:** Laparoscopic supracervical hysterectomy, Minimally invasive surgery, Hysterectomy, Total vaginal hysterectomy, Total abdominal hysterectomy, Laparoscopic vaginal hysterectomy.

## INTRODUCTION

The traditional approach to selection of the appropriate hysterectomy operation has been, that, if possible, a total vaginal hysterectomy should be done.<sup>1</sup> If a TVH is not possible because of problems of size, access, or intraabdominal pathology, an abdominal hysterectomy is performed. In recent years, laparoscopic vaginal hysterectomy has been suggested as a less invasive alternative for most abdominal hysterectomies,<sup>2</sup> because morbidity and recovery time are lessened by this approach. More recently, with the availability of morcellators, the supracervical operation has been revived by the utilization of the laparoscopic approach.<sup>3</sup> The purpose of this study was to compare the intra- and postoperative parameters of the 4 approaches to hysterectomy. The author's thesis is that laparoscopic supracervical hysterectomy is preferable to other types of hysterectomy in operating time, morbidity, hospitalization, and recovery times. The author feels that, in the absence of an indication to remove the cervix, it is the operation of choice.

## METHODS

The records of Alamance Regional Medical Center were used to select 400 patients who had had total abdominal hysterectomy (TAH), total vaginal hysterectomy (TVH), laparoscopically assisted vaginal hysterectomy (LAVH), or laparoscopic supracervical hysterectomy (LSH). Alamance Regional Medical Center (ARMC) is a 238-bed, private,

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not-for-profit hospital in the piedmont of North Carolina. The Ob/Gyn department has 10 members and is not served by a training program. All of the doctors are in private practice and range in age from 30 to 65. All but one member of the ARMC Department of Ob/Gyn consented to having their patients contacted to participate in the study; the objecting physician's patients were excluded.

A certified medical record technician (MRT) selected the patients from a computerized database of surgical procedures. Patients were selected blindly from lists of patients having the specific types of hysterectomy. The time frame was from 1999, when LSH procedures were begun in the hospital, to 2002. Patients were excluded from consideration if they had any other procedure performed at the same time other than salpingo-oophorectomy or minor lysis of adhesions. The patients were then sent a consent form for examination of the medical record and a short questionnaire (Figure 1). If a patient returned the consent and questionnaire, her chart was pulled and abstracted by the MRT; otherwise, her name was discarded. The data collection form is shown in Figure 2. The data were tabulated and "de-identified" before being given to the researcher. The data were then analyzed by ANOVA and Tukey-Kramer comparisons using Graphpad InStat V 3.05

for Windows. This project was approved by the ARMC internal review board and was found to be in compliance with HIPAA requirements.

Data collected from the patient questionnaire included the patient's time of return to intercourse and work. The patient was asked whether she had had any problems or complications following her surgery, as these might not have been included in the hospital chart. The questionnaire asked for her subjective evaluation of sexual, bowel, and bladder functioning since her surgery.

The hospital record was abstracted to collect patient age and weight, length of stay, weight of uterus, pathology diagnosis, blood loss, operative time, and any intraoperative complication. The nature of the complications and their severity were not defined beyond the need for an additional diagnosis on the discharge final diagnosis. We wished to first establish that the patients who had different types of hysterectomy were comparable, and then to see whether any differences existed in the parameters of the surgery or the outcomes.

Techniques of TAH and TVH require no further description. LAVH included any procedure in which the uterus was dissected free laparoscopically, down to the vaginal

Did you have to return to the hospital or ER for a problem associated with your surgery?	
<b>YES</b>	<b>NO</b>
<i>What was the problem?</i>	
_____	
I was able to return to most normal activities in _____ weeks following my surgery.	
I returned to my work _____ weeks after my surgery.	
I was able to resume intercourse _____ weeks after my surgery.	
I have had continued bleeding.	<b>Y</b> <b>N</b>
I have had continued pain.	<b>Y</b> <b>N</b>
I have pain with intercourse.	<b>Y</b> <b>N</b>
After surgery, intercourse is <b>BETTER</b> <b>WORSE</b> or <b>SAME</b> <b>NA</b> as before surgery?	
I have done <b>BETTER</b> or <b>WORSE</b> than other women who have had a hysterectomy?	
I have had continuing problems with bladder or bowel after recovery from my hysterectomy.	
<b>Y</b>	<b>N</b>
<i>What sort of problem?</i>	
_____	

Figure 1. Patient questionnaire.

CHART REVIEW	
AGE _____	WEIGHT _____
PREOP-DIAGNOSIS _____	
OP TIME _____	EBL _____
UTERINE WEIGHT _____	
PATHOLOGY _____	
INTRAOPERATIVE COMPLICATION _____	
POSTOPERATIVE COMPLICATION _____	
LOS _____	

Figure 2. Chart review form.

cuff, if the uterus was delivered vaginally whether or not the uterine vessels and vaginal cuff were cut laparoscopically. Instruments and technique varied from surgeon to surgeon. Most used a combination of bipolar cautery, monopolar cautery and Ultracision. Stapling devices were used rarely, if at all. Manual morcellation was used on large uteri when needed to effect vaginal delivery.

LSH patients all had benign preoperative diagnoses and had no abnormal pap smears or procedures for dysplasia within 10 years. The LSH was performed using bipolar cautery, LigaSure, and Ultracision scalpel. A change in instrumentation occurred over the 3 years of the study, depending on what was available at the hospital. The

uterus was removed with a Gynecare X-tract morcellator. All of the tissue was sent to pathology. Blood loss was the circulating nurse’s notation. Operative time was the anesthesia time, which in our institution overestimates operating time by about 15 minutes.

**RESULTS**

Results are shown in **Tables 1-3** and **Figure 3**. In each, the *P* values and 95% confidence intervals are used to compare the LSH to the other types of hysterectomy. **Table 1** shows demographic data. The 4 groups of patients were compared for age and body weight. Compar-

**Table 1.**  
Demographics

	LSH*	TAH*	TVH*	LAVH*
Number	28	37	23	29
Age±SD	40.6±6.3	42.5±9.8	41.4±6.7	39.4±5.7
<i>P</i> value		>0.05	>0.05	>0.05
CI*	38.1–43.0	39.2–45.7	38.4–44.2	37.2–41.6
Weight (lbs)±SD	191.3±45	168.7±42	155.4±20	154.6±35
<i>P</i> value		>.05	<0.01	<.01
CI*	173–208	155–183	144–166	141–168
Uterine Weight (g)±SD	140.6±152	223.4±211	150.7±72	117.7±79
<i>P</i> value		>0.05	>0.05	>0.05
CI*	81–200	153–294	118–183	88–148

\*CI=95% confidence interval; LSH=laparoscopic supracervical hysterectomy, LAVH=laparoscopically assisted vaginal hysterectomy, TAH=total abdominal hysterectomy, TVH=total vaginal hysterectomy.

**Table 2.**  
Operative Parameters

Parameter	LSH*	TAH*	TVH*	LAVH*
EBL±SD	107±137	127.08±92	173.7±101	131.52±167
<i>P</i> value		>0.05	>0.05	>0.05
CI*	52–162	95–158	129–218	59–204
Operative Time±SD	67.7±23.8	63.3±21.9	55.6±19.9	81.1±20.5
<i>P</i> value		>0.05	>0.05	>0.05
CI*	58–77	56–71	47–64	73–89
Length of Stay±SD	1.17±0.47	2.37±0.59	1.56±0.59	1.27±0.7
<i>P</i> value		<0.001	1.57>0.05	>0.05
CI*	0.99–1.3	2.1–2.5	1.3–1.8	1.0–1.5
Intraoperative Complications	0/28 0%	0/28 0%	0/23 0%	2/31 6%
<i>P</i> value	<i>P</i> =0.33	<i>P</i> =0.38	<i>P</i> not calculable	<i>P</i> =0.38

\*CI=95% confidence interval; LSH=laparoscopic supracervical hysterectomy, LAVH=laparoscopically assisted vaginal hysterectomy, TAH=total abdominal hysterectomy, TVH=total vaginal hysterectomy.

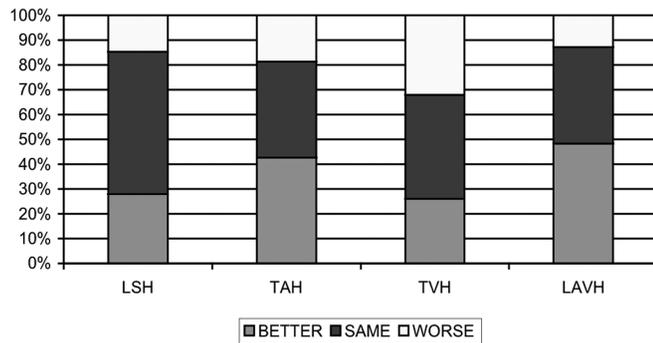
**Table 3.**  
Postoperative Parameters

	LSH*	TAH*	TVH*	LAVH*
Bleeding	1/28 (3.6%) <i>P</i> =0.86	0/28 (0%) <i>P</i> =0.25	2/23 (8.7%) <i>P</i> =0.44	2/29 (14.1%) <i>P</i> =0.65
Pain	2/28 (7%) <i>P</i> =0.40	5/28 (18%) <i>P</i> =0.27	3/23 (13%) <i>P</i> =0.48	3/29 (10%) <i>P</i> =0.78
Bowel/Bladder	3/28 (11%) <i>P</i> =0.25	5/28 (18%) <i>P</i> =0.44	4/23 (17%) <i>P</i> =0.49	8/29 (27%) <i>P</i> =0.17
Postoperative Complications	0/28 (0%) <i>P</i> =0.045	5/28 (18%) <i>P</i> =0.0086	3/23 (13%) <i>P</i> =0.048	1/29 (3%) <i>P</i> =0.35
Resume Intercourse (weeks)±SD	4.62±1.8	5.7±1.9	6.6±0.2	4.72±1.8
<i>P</i> value		>0.05	<.005	>0.05
CI	3.8–5.4	5.2–6.7	5.5–7.5	4.0–5.4
Return to Work (weeks)±SD	3.4±1.89	5.9±2.0	4.63±1.8	4.17±1.7
<i>P</i> value		<0.001	>0.05	>0.06
95% CI	2.6–4.1	5.1–6.6	3.6–5.4	3.4–4.7
Dyspareunia	1/20 (5%) <i>P</i> <0.001	4/27 (14%) <i>P</i> <0.001	5/17 (29%) <i>P</i> <0.001	2/29 (10%) <i>P</i> <0.001

\*CI=95% confidence interval; LSH=laparoscopic supracervical hysterectomy, LAVH=laparoscopically assisted vaginal hysterectomy, TAH=total abdominal hysterectomy, TVH=total vaginal hysterectomy.

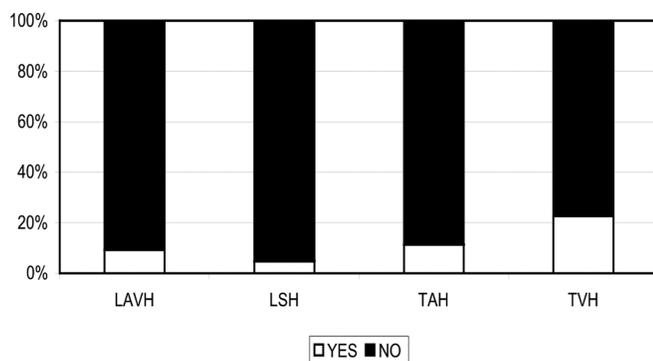
ison of age showed no significant difference in age ( $P>0.10$ ). Body weight showed LSH patients to be heavier than the TVH and LAVH patients. Uterine weights were similar ( $P>0.05$ ). TAH uterine weights were greater, but

the difference was not significant. **Table 2** examines intraoperative parameters. There seemed to be less blood loss in laparoscopic procedures, but the difference did not reach statistical significance. Operative times were similar.



**Figure 3.** Intercourse quality postoperatively.

Not surprisingly, there were shorter operating times for TVH. Length of stay was shorter for LSH than for the other types of hysterectomy. The difference was statistically significant, though only in comparison with the TAH. Only 2 intraoperative complications were reported, both during LAVH. Occurrences during posthospital recuperation are in **Table 3**. Reports of bleeding, pain, bowel or bladder problems, and postoperative complications are difficult to interpret, and indicate only that they were significant to the patient. Generally, the trends seem to show little difference in bleeding at home, but less pain in the laparoscopic procedures, and fewer postoperative problems in the laparoscopic procedures. Resumption of intercourse was sooner in the laparoscopic procedures, but in this sample only reached statistical significance in comparing TVH and LSH. Return to work was quickest in LSH and was followed by LAVH, TVH, and TAH in that order. This difference only reached significance in the LSH-TAH comparison. Quality of intercourse (better-same-worse) is presented in graph form in **Figure 3**. There seems to be no significant difference. Dyspareunia was reported more frequently in TVH with LSH having the least incidence (**Figure 4**). For this sample size, the differences in protocols give a power calculation of 0.58, so



**Figure 4.** Dyspareunia.

a bigger sample is necessary to give adequate power; however, for a retrospective case series, such as this, power calculations are less meaningful.

## DISCUSSION

The theoretical role for LSH is based on several possibilities. First are the advantages of the operation itself. That is, is it less morbid than other hysterectomy techniques. Second is the question of whether the operation has advantages of its own beyond the operative parameters. It is theorized that the LSH, because it does not involve mobilization of the bladder base may cause less bladder dysfunction. Evidence exists both for and against this possibility.<sup>4-8</sup> It is also theorized that, with less dissection of the pubovesicocervical fascia, it is less likely to result in pelvic floor weakness. In training, all residents are instructed to sew the cardinal and uterosacral ligaments to the cuff and every textbook has diagrammatic pictures of this procedure.<sup>9</sup> Most practicing gynecologists recognize that these tissues may be illusory, damaged, or may not survive the suturing process. Indeed, enterocele is at least as common a sequelae of total hysterectomy as cervical prolapse is of supracervical.<sup>10,11</sup> We feel that it is incumbent on the operator to ensure the stability of the uterosacral-pelvic floor complex no matter which procedure is performed. It is also theorized that sexual function is less likely to be affected because no scar exists in the vaginal apex at the point that penile impact is greatest and also because no shortening of the vagina or dissection of the nerves traversing the uterosacral ligaments occur.<sup>12</sup> The author does not feel that the data really address these questions in more than a very superficial way.

The data do show that the LSH patients were similar to the other patients in age, body weight, and uterine size. The uterine size was somewhat larger in the TAH group. This is not surprising as even a confident and skilled operator may feel that a large fibroid uterus will be easier to handle through an abdominal incision than vaginally or laparoscopically. There was a curious tendency for LSH patients to be heavier than the others. It is the LSH surgeon's belief that obesity is less of a hindrance in laparoscopic than in open or vaginal surgery. Operative times were about as one would anticipate, LAVH>LSH>TAH>TVH. However, it is surprising to see how small the differences were. These cases were drawn from procedures done more than 2 years ago, and will be interesting to see whether the surgeon's advancement along the learning curve has changed these relationships. Other parameters seem to show an advantage to LSH as regards blood loss, intra-

and postoperative complications, dyspareunia, and resumption of normal activities, though these differences are generally small. Long-term parameters, such as postoperative conversion of a normal pap smear, residual menstruation, cervical pain, or late complications have not been examined. These will be addressed in a later study as well as the effect of the surgeon's experience on the operative parameters.

## CONCLUSION

This retrospective series compares patients who had undergone different operative approaches to hysterectomy. The data suggest that the hysterectomy patients are all drawn from the same population as regards age, body weight, and uterine weight. Differences suggest that LSH patients may be more obese and that TAH patients may have larger uteri. In other parameters examined, trends favored LSH. This study does not address long-term complications or concerns, such as residual menstruation from the cervical stump, cervical pain, or conversion of a normal pap smear. It is shown that in a small, primary care hospital, LSH can be used safely and with somewhat less morbidity and shorter length of stay than TAH, TVH, and LAVH. The thesis is that in the absence of other factors, of several similar operations, the less morbid operation is preferable. In this case, the author believes that these data suggest that LSH is certainly not a more morbid operation than the other types of hysterectomy and that it may actually represent a safer operation with a shorter length of hospitalization and a quicker return to normal activities. Further studies with larger group size will be necessary to confirm our findings.

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