Laparoscopic Supracervical Hysterectomy Compared to Total Hysterectomy

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ABSTRACT

Background: The aim of this study was to compare perioperative results of laparoscopic supracervical hysterectomy (LSH) with those of laparoscopic total hysterectomy (TLH).

Methods: A retrospective cohort study was conducted at the Department of Gynecology at a teaching hospital. A group of 157 patients who underwent TLH was compared with a group of 157 patients who underwent LSH with or without bilateral salpingo-oophorectomy (BSO). Both groups had similar baseline characteristics and comparable surgical indications.

Results: We reviewed our 7-year experience with laparoscopic hysterectomies performed at our department between October 2000 and November 2007. The similarities between patient characteristics were tested by using Wilcoxon Rank Sum Statistics. Patient and surgery characteristics as well as surgery outcomes were analyzed with descriptive statistics showing medians and 95% CIs. Women who underwent LSH had a shorter operation time compared with women in the TLH group (100 min vs. 110 min). Major complication rates were higher in the TLH group than in the LSH group (4.5% vs. 1.3%). Minor complication rates were 13.3% in the TLH group compared with 13.4% in the LSH group.

Conclusions: Our data and experience provide specific information about the perioperative performance of LSH compared with TLH. In our experience, LSH proved to be a valid alternative to TLH in the absence of specific indications for TLH. Adequate counseling concerning the risk of cyclical bleeding and reoperation is mandatory.

Key Words: Total laparoscopic hysterectomy, Laparoscopic supracervical hysterectomy, Bilateral salpingo-oophorectomy.

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INTRODUCTION

Minimally invasive surgery involves the utilization of small incisions to perform surgical procedures. In most cases, the use of this minimal approach helps to minimize patient discomfort and ensures a faster recovery. The application of minimally invasive procedures has led to the development of various techniques in which laparoscopy is used as an aid to hysterectomy. These variations have a potential impact on intraoperative and postoperative complication rates and patient satisfaction. Terms such as CISH (classic intrafascial Semm hysterectomy) and LASH (laparoscopic-assisted subtotal hysterectomy) have been introduced to describe a subtotal hysterectomy performed via the laparoscopic route. However, we have chosen to use the AAGL nomenclature for the classification of laparoscopic hysterectomy; thus LSH for laparoscopic supracervical hysterectomy refers to the subtotal hysterectomy performed by laparoscopy. This classification introduces a further concept of stratification (LSH I-II-III) when referring to the occlusion or division of the uterine arteries as a part of the procedure.[1] Laparoscopic supracervical hysterectomy represents a reliable option for a number of benign gynecological conditions with a quick recovery after the operation and a rapid return to normal activities. The safety, effectiveness, and reproducibility of this procedure have been documented by the great number of participating patients.[2]

Despite the proven efficacy of LSH, several issues, such as the occurrence of cyclical bleeding after the operation and the fear for cervical cancer, have contributed to dampening the enthusiasm of patients and doctors using this procedure. Nevertheless, a retrospective review of 334 cases showed that trachelectomy after subtotal hysterectomy is infrequent, and in three-quarters of the cases, the indication for it is prolapse of the cervical stump.[3]

The present study aims to point out the potential applications of LSH in general gynecological practices comparing it with the results of TLH for benign disease. In our daily practice, LSH is not intended to replace TLH. We want to offer patients an alternative option of a minimally invasive procedure when the need to remove the cervix is not strictly necessary or simply not desired.

MATERIALS AND METHODS

From October 2000 through November 2007, 158 women underwent laparoscopic supracervical hysterectomy (LSH) with or without bilateral salpingo-oophorectomy (BSO). Of the total number of women who were treated by total laparoscopic hysterectomy (TLH) during the same time span, we made a selection from the whole list choosing an equal number of patients operated on for benign conditions to compare them with the LSH group. A list of eligible TLH patients operated on during the study period was obtained from an operating room database. These patients were chosen according to the following matching criteria: age (maximum interval ± 5 years) and surgery date (maximum interval ± 2 years).

Physical characteristics (eg, weight, previous health status) or socioeconomic circumstances were not taken into consideration in 'case matching'. Both groups of patients had similar indications for the operation. The exclusion criteria were based on patients whose TLH procedures were performed due to endometrial cancer and those TLH and LSH cases requiring ancillary procedures. The surgical outcomes of the 2 groups were compared. Most of the data concerning the physical characteristics of the patients and surgical intra- and postoperative data up to 6 weeks after surgery were collected from the patient records. For supplementary information regarding the exact duration of the operations, we referred to the (computer) operating room database. Due to the lack of specific information from this database, anaesthesia time was not evaluated.

We did not include patients operated on with TLH for stage I endometrial cancer, because of the possible prolongation of the operation time due to intraoperative pathologic evaluation. Also we excluded all the patients undergoing concomitant major procedures in both groups. TLH performed on women affected by cervical intraepithelial neoplasia of various grades were not excluded from the series. LSH was not considered indicated and thus not performed in cases of cervical dysplasia or neoplasia, endometrial hyperplasia with or without atypia, endometrial cancer, atypical ovarian cysts discovered at the time of operation or intraoperative finding of a suspect ovary or tuba. A partially prolapsed uterus formed an absolute contraindication for LSH as other forms of symptomatic prolapse of genital organs requiring appropriate surgery. LSH was not performed on any patients suffering from endometriosis, adenomyosis, and cervical myomas. All patients went through a standard preoperative checkup, including pelvic ultrasound investigation and cervical cytology. Hysteroscopy with biopsy was performed systematically only in those patients who were candidates for LSH except in those cases with specific indications for it.

Statistical Analyses

Descriptive statistics were used for patient and surgery characteristics. Statistical analyses were performed using SPSS for Windows (SPSS 16.0, SPSS, Inc., Chicago, IL). A 2-sided alpha level of 0.05 was used to determine statistical significance. A 2-tailed Student t test was used to compare the means of the 2 groups. The analysis of minor complication rates were the same for major complication rates. We did not use logistic regression to adjust major or minor complication rates found in those cases with previous surgery and salpingo-oophorectomy.

Patient Characteristics and Surgical Outcomes

Patient characteristics included age, BMI, prior surgery, and weight of the uterus. Outcomes concerning the operation included operation time and Hb drop, defined as the difference between pre- and postoperative values of hemoglobin. The postoperative Hb value was defined as the hemoglobin value obtained at least 6 hours after the end of the procedure and before any blood transfusion was given. Due to the retrospective character of the study, we referred to the median drop in hemoglobin rather than the amount of blood loss expressed in mL due to lack of this specific annotation in a number of cases. The operation time was calculated as time in minutes from the first incision to the last suture. Physical complications during the operation or following the procedure were categorized in several ways: presence or absence of any complications, number of complications, major complications, and minor complications. The observation time span ranged from the day of the admission of the patient until 6 weeks after surgery. A complication was defined as a major complication in case of any perioperative events that would lead to substantial morbidity and disability. Minor complications included those complications not meeting the above definition of major complications. Bowel injuries, bladder injuries, ureter injuries, blood transfusions, thrombosis, vaginal bleeding, and return to the surgical suite were classified as major complications. Minor complications were wound infection, hematoma, minor anesthesiological complication, urinary infection, fever >38°C lasting longer than 24 hours, pelvic cellulitis, urinary retention, and cuff abscess. Those procedures that needed a conversion from laparoscopy to laparotomy were not classified as complications in our analysis because a conversion from a planned laparoscopic hyster-

ectomy to an open procedure was considered necessary as a change of strategy rather than a complication. The sequential surgical steps of the TLH procedure as performed at our institution are introduction of the uterine manipulator type Clermont-Ferrand, first entry with an open laparoscopy technique followed by introduction of a central 12-mm trocar 3cm above the umbilicus, insertion of 2 ancillary trocars of 5mm on the left patient side lateral to the epigastric vessels, the first one placed at the level of the umbilicus the second placed 2cm higher and medial to the first one. An additional ancillary trocar is inserted on the right side. We start with a transecting transverse incision made at the level of the cranial insertion of the utero-sacral ligaments using the unipolar hook electrode. The following steps are unipolar coagulation and cutting (C & C) of the round ligament on both sides, preparation of the bladder flap, C & C of the utero-ovarian or infundibulo-pelvic ligament bilaterally, C & C of the uterine vessels, vaginal circular incision using unipolar hook. The vagina is closed with an intracorporeal suture. Patient preparation, achievement of pneumoperitoneum and placement of the trocars for the LSH procedure are carried out as described for TLH. The first surgical step is coagulation and transaction of the round ligament, preparation of the bladder flap, C & C of the utero-ovarian or infundibulopelvic ligament on either side, identification of the cervical branches of uterine arteries and their coagulation and cutting at the level of the internal cervical *os,* separation of the uterus from the cervix and coagulation of the cervical canal with the unipolar electrode. This kind of technical approach for uterine arteries was standardized in 2000 by the AAGL and was defined as "Type LSH III."[1] Our standard procedure for LSH does not include peritonization.

RESULTS

Patient demographics show that patients in the TLH group were older at the time of the operation **(Table 1)**.

Previous surgery was more likely in the patients operated on with LSH, and no significant differences were noted between these 2 groups with respect to BMI. Details concerning the operation showed a significantly longer operation time in the TLH group ($P<0.05$) and a greater value of Hb drop (2,431 vs. 2,091, $P<0.01$) in the group of patients operated on with TLH **(Table 1)**. Despite the TLH group showing a higher median uterine weight, the difference was not regarded as being significant ($P=0.589$). The LSH group reported fewer major complications than the TLH group did (4.4% vs. 1.3%), as shown in **Table 2**. We found 2 bowel injuries in the 158 TLH group patients. The first one was diagnosed during the operation and was repaired laparoscopically. Another patient had to be readmitted because of signs of acute peritonitis. An emergency laparotomy had to be performed followed by intestinal resection of the injured tract. With respect to complications of the urinary tract, we found more complications in the TLH group. We noted 2 cases of bladder lesions repaired laparoscopically and a case of thermal damage of the ureter wall. This resulted in a postoperative ureteral stenosis followed by reintervention and ureteral anastomosis after unsuccessful conservative management. Two of the 158 patients of the LSH group reported major complications: an intestinal lesion caused by inadvertent use of a nonelectric cutting instrument repaired laparoscopically and a thrombosis of the deep femoral vein.

Table 3 shows the minor complications that occurred with each procedure. There were no statistical differences between TLH and LSH.

Table 1.
Patient Characteristics

Characteristic	TLH	LSH	Two Sided P Value
Age	50.25 ± 7.83	49.49 ± 7.372	0.375
BMI*	27.61 ± 4.4	27.59 ± 3.477	0.966
Prior surgery	0.54 ± 0.500	0.59 ± 0.404	0.0428
Operation time	121.71 ± 44.277	111.36 ± 39.068	0.028
Drop in Hb	2.431 ± 0.8449	2.091 ± 0.8676	0.01
Uterus weight	169.68 ± 116.584	162.70 ± 112.743	0.589

*BMI = body mass index; TLH = total laproscopic hysterectomy; LSH = laparoscopic supracervical hysterectomy.

Table 2.
Major Complications

Complication	TLH (n = 158)	LSH (n = 158)	Two Sided P Value
Bowel injuries	2	1	0.563
Bladder injuries	2	0	0.158
Ureter injuries	1	0	0.319
Transfusion	1	0	0.319
Thrombosis	0	1	0.319
Vaginal bleeding	1	0	0.319
(Resurgery)	(2)	(0)	0.158
Total	7	2	

*TLH=total laproscopic hysterectomy; LSH=laparoscopic supracervical hysterectomy.

Table 3.
Minor Complications

Complication	TLH* (n = 158)	LSH* (n = 158)	Two Sided P Value
Wound infection	2 (1.2)	3 (1.9)	0.653
Hematoma	2 (1.2)	3 (1.9)	0.653
Anaesthesia minor	1 (0.6)	2 (1.2)	0.996
Urinary infection	7 (4.4)	5 (3.1)	0.364
Fever > 38	6 (3.7)	7 (4.4)	0.364
Pelvic cellulitis	2 (1.2)	1 (0.6)	0.996
Urinary retention	1 (0.6)	0	0.319
Cuff abscess	1 (0.6)	0	0.319
Total	22	21	

*TLH=total laproscopic hysterectomy; LSH=laparoscopic supracervical hysterectomy.

DISCUSSION

Epidemiological data indicate a hysterectomy rate in Italy of 36.7/10 000 women aged >35 years, although the level of rates varied considerably between different regions. The majority of hysterectomies (82%) are performed for benign conditions.[4] Genital prolapse accounts for only 16.4% of all hysterectomies. Because of the lack of a national registry in Italy, reliable data concerning the prevalence rate of laparoscopic hysterectomy are missing, although isolated reports seem to confirm the rising trend of laparoscopy rather than other surgical approaches for hysterectomy.[5]

The laparoscopic approach for hysterectomy ensures a shorter postoperative recovery and quick return to work.[6] Complication rates do not seem to be higher than those with traditional open procedures.[7] In most cases, there is no specific clinical indication to remove the cervix. Although the intraoperative surgical performance of open supracervical hysterectomy may not be applicable to its laparoscopic homologue, the results reported by a Cochrane review about postoperative outcomes of supracervical hysterectomy when compared with total hysterectomy deserve full consideration.[8] Urinary function and sexual function were comparable in the 2 groups examined. Lack of adequate follow-ups in all studies did not allow for a clarification between the primary postoperative outcomes and the quality of life for the 2 procedures. The only randomized study directly comparing TLH and LSH did not observe statistical differences in surgical performances and clinical outcomes.[9] Nevertheless, a number of large series of LSH procedures[10–12] demonstrating the safety and effectiveness of this operation. Lyons reports in his series of 1500 procedures a remarkably low rate of febrile morbidity (1%), blood transfusion (0%), and reoperation (0.001%), including patients with severe endometriosis and severe adhesive disease.[2] In many cases, the choice of the professionals between performing a TLH procedure instead of an LSH seems to be influenced by fear of cervical cancer. In this regard, current evidence demonstrates that the risk and the prognosis of cancer in the cervical stump are comparable to those present in the general population.[13,14] Implementation of cervical screening programs in western countries may further trigger the increasing trend towards subtotal (laparoscopic) hysterectomy. Trends in Danish hysterectomy rates from 1988 to 1998, for operations done on benign pathologies showed a marked increase in subtotal hysterectomies up to 458%, while total hysterectomies decreased by 38% throughout the same period of time. A study on 32 321 hysterectomies performed at the Kaiser Permanente Department of Obstetrics & Gynecology from 1994 to 2003 showed an increase in supracervical hysterectomy of 156%.[15,16]

During 2007 in our Department, the relative increase in the performance of laparoscopic hysterectomy reached more than 85% of the scheduled cases for a simple hysterectomy, excluding those cases that are approached vaginally. The number of laparoscopic supracervical hysterectomies increased by 62% over the last 5 years. Our results, with all the limitations related to the retrospective character of the study, show that LSH has a remarkably lower major complication rate compared with TLH. We

had no lesions of the urinary tract in the LSH group of our series compared with 2 lesions of the bladder and one thermal injury affecting the ureter in the TLH group. Urological lesions accounted for 42% of the total number of intraoperative complications during TLH. In the LSH group, the major complication rate was slightly higher than the average rate published.[17,18]

When excluding the specific case of DVT of the femoral vein, the rate of major complications occurring during surgery for LSH decreased 0.63%. DVT is strictly not definable as an intraoperative complication, although it is still related to the operation. Readmission rates for major and minor complications was 1.8% in the LSH group compared with 3.1% in the TLH group. Readmission rates included all patients readmitted within 6 weeks after surgery. Heavy bleeding, defective healing of the vaginal vault, or wound disruption are possible complications after TLH. In our experience, we observed one case of heavy vaginal bleeding in the TLH group that occurred 13 days after the procedure, which required blood transfusion and immediate resuturing. The occurrence of vault problems varies between 1.1% and 3.7%[2,19] and seems to be more frequent for TLH cases compared with other methods of hysterectomy. In contrast, this type of complication is rare after supracervical hysterectomies.[20,21] Excessive or improper use of bipolar coagulation appears to be a risk factor for this kind of complication. Surgical disruption of the paracervical structures during TLH could be a causal factor relating to the weakness of the vaginal cuff, predisposing it to dehiscence. We found that in taking into consideration demographic differences women in the TLH group had an older median age at the time of their operation. Evidently, younger women are more likely to choose to preserve the cervix than older ones are (>45 years)[22] and further research needs to be undertaken regarding these preferences and the possible relationship to sexuality and marital status.

CONCLUSION

Laparoscopic hysterectomy, in its different forms, has been shown to be a safe and effective procedure for the management of a number of benign gynecological conditions. Due to the improved screening programs and new progress made in the early diagnosis of cervical pathology there is no particular need to remove the cervix with the exception of oncological conditions and specific benign diseases like endometriosis, ademyosis, and cervical myomas. Our data and experience provide specific informa-

tion about the perioperative performance of LSH compared with TLH. Major complications in LSH were significantly less than those in TLH, while minor complication rates were comparable in the 2 groups. Urological complications occurred more often in TLH. In our experience, LSH may represent a valid and safe alternative to total laparoscopic hysterectomy in the absence of specific indications to remove the cervix. Adequate counseling concerning the risk of cyclical bleeding and reoperation is mandatory.

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