

Using the LigaSure vessel sealing device in the large uterus at laparoscopic hysterectomy

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Summary

Objective: To compare intraoperative hemorrhage and other operative parameters between patients with large and small weighted uterus who underwent laparoscopic hysterectomy (LH). **Materials and Methods:** Forty-six patients intending to have LH were divided into two groups according to uterine weight (group 1 > 300 grams vs. group 2 < 299 grams). Intraoperative blood loss, operating time, perioperative complications, and duration of hospitalization were compared. **Results:** Intraoperative blood loss was significantly higher in the large uterus group (group 1); 350 (227–454) ml vs. 250 (182–320) ml ($p < 0.001$). However, it was not significantly different between the groups in the laparoscopy step. Mean operating time was 90 (77–103) minutes and 80 (62–98) minutes in groups 1 and 2, respectively ($p < 0.001$) revealing ten-minute delay in group 1. Similarly, this was also not significantly different in the laparoscopy step. No significant differences were found between two groups; in terms of hemoglobin concentration decrease, major and minor complications, and hospitalization duration. **Conclusion:** The authors conclude that LigaSure can be safely used for LH in patients with a large uterus.

Key words: Laparoscopy; Hysterectomy; Large uterine size; LigaSure.

Introduction

Hysterectomy is the most frequent of major gynecologic operations [1]. Laparoscopic hysterectomy (LH) became the first choice for hysterectomy performance of many surgeons after it was initially presented in 1989 [2]. This can be attributed to quick postoperative recovery time advantage. By the help of contemporarily achieved developments in surgical equipments and techniques with additional training, total LH (TLH) became a well-tolerated, safe, and efficient modality. The present authors consider that the most critical step during LH is securing the uterine arteries. Because if bleeding occurs during this step, there may be a higher risk of failure in completing the operation due to limited optical view or may have increased rate of adjacent organ complications. Therefore precise hemostasis is warranted in LH particularly in patients with large uterus. New energy modalities may be valuable supports to achieve this goal. In a previous study the present authors have shown that LigaSure vessel sealing system is a safe energy modality in securing uterine arteries at LH [3]. However, the aforementioned studies do not represent the safety of LigaSure in patients with the large uterus. In addition, the literature lacks clear data regarding the safety of LigaSure vessel sealing device when used for LH in patients with the large uterus. Therefore in the present study the authors aimed to assess the safety and efficiency of LigaSure in patients who underwent LH with large uterine size concerning intraoperative outcomes.

Materials and Methods

Intraoperative and postoperative data of both groups were recorded and analyzed. LH was performed under general anesthesia. In the present study the authors secured uterine arteries at their entry into the uterus with LigaSure V mm (Figure 1). This technique was different from our previous study in which uterine arteries were secured retroperitoneally [3]. In the vaginal part of the operation, LigaSureVmax was used. Lithotomy position was preferred in all patients for operation with drain implementation only when indicated. The operational records analyzed included, total operating time (from the maintenance of pneumoperitoneum to vaginal cuff closure), durations of laparoscopic and vaginal parts separately, total estimated blood loss, mean blood loss in laparoscopic and vaginal parts of the operation separately, mean

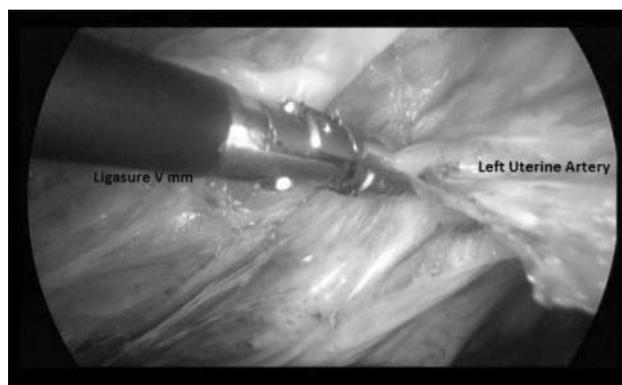


Figure 1. — Sealing of the left uterine artery using Ligasure V mm.

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Table 1. — Demographic characteristics of both groups.

	Group 1 (> 300 gr) (n=22)	Group 2 (< 299 gr) (n=24)	p value
Age (years)*	48 (39–57)	51 (41–62)	0.83
Body mass index (kg/m ²)*	24 (21–27)	25 (22–28)	0.81
Parity*	2 (0–6)	2 (0–5)	0.74
Previous cesarean section ^{&}	5 (22.7 %)	7 (29.1 %)	0.62
Previous lower abdominal pelvic surgery ^{&}	3 (13.6 %)	4 (16.6 %)	0.48

* Mann-Whitney U test. [&]Chi-Square test.

Table 2. — Hysterectomy indications.

	Group 1 (> 300 gr.) (n=22)	Group 2 (< 299 gr.) (n=24)
Uterine fibroid	12 (54.5%)	11 (45.8%)
Endometrial hyperplasia	3 (13.6%)	5 (20.8)
Ovarian tumor	2 (9.1%)	3 (12.5%)
Pelvic endometriosis	1 (4.5%)	-
Adenomyosis	1 (4.5%)	1 (4.1%)
Cervical intraepithelial neoplasia	2 (9.1%)	3 (12.5%)
Postmenopausal bleeding	1 (4.5%)	-
Menorrhagia	-	1 (4.1%)

value of decrease in Hb concentration, uterus weights, intraoperative and postoperative complication incidence, conversion from laparoscopy to the classic abdominal approach, blood transfusion requirement, and hospitalization duration. Blood loss was measured by recording the contents of the fluid extraction device in both steps.

Statistical analysis

Statistical Analysis was performed using the SPSS ver. 14. Median, medium and percentages of the variables were analyzed. The differences between the two groups were analyzed by Chi-Square test or Mann Whitney U test. A *p* value < 0.05 was considered statistically significant.

Results

In this cohort study, a total of 46 LHs were performed. Group 1 consisted of 22 patients whose uterus weight was ≥ 300 grams, whereas group 2 consisted of 24 patients whose uterus weight was ≤ 299 grams. To ensure similar demographic characteristics between the groups, the authors only included patients with only one previous abdominal surgery and similar body mass index values.

Table 1 illustrates demographic characteristics of both groups. No significant differences were found between the variables. The most common indication in both groups was uterine fibroid. Indications for LH were also similar between two groups (Table 2). Table 3 depicts intraoperative variables in both groups. Total operation time was significantly longer in group 1 [90 (77 – 103) minutes vs. 80 (62 – 98) minutes] (*p* = 0.001). This significance was due to the vaginal step of operation as it was significantly longer

Table 3. — Operative data.

	Group I (>300 gr) (n=22)	Group II (<299 gr) (n=24)	p value
Total operation time (min) ^{&}	90 (77–103)	80 (62–98)	0.001
Vaginal step (min) ^{&}	29 (22–35)	18 (14–23)	0.042
Laparoscopy step (min) ^{&}	36 (30–43)	42 (27–57)	0.082
Median blood loss (MBL) (ml) ^{&}	350 (227–454)	250 (182–320)	0.001
MBL in vaginal step (ml) ^{&}	240 (160–280)	160 (100–210)	0.035
MBL in laparoscopy step (ml) ^{&}	110 (80–145)	90 (70 - 120)	0.70
Median Hb drop (mg/dl) ^{&}	2.1 (0.4–3)	1.6 (0.6–2.3)	0.76
Median uterine weight (grams) ^{&}	380 (300–550)	140 (110–220)	0.001
Major complications*	0	0	0.17
Minor complications*	1	1	0.92

Percentage and range in brackets. [&]Mann-Whitney U test. *Chi-Square test.

in group 1 [29 (22 - 35) minutes vs. 18 (14 - 23) minutes] (*p* = 0.042). However, mean duration for laparoscopy step was similar between the groups (Table 3). Mean intraoperative blood loss was also not significant between the groups (Table 3). However blood loss in the vaginal step was significantly higher in group 1 [240 (160 – 280) ml vs. 160 (100 - 210) ml] (*p* = 0.035.) There were no major intra- and postoperative complications in both groups. In group 1, one patient had trocar site infection and one patient in group 2 had postoperative urinary tract infection. There was no conversion from laparoscopy to laparotomy in any group. None of the patients in both groups had blood transfusion. All patients were discharged on the first postoperative day.

Discussion

The well known reported advantages of LH compared to laparotomy are less intraoperative bleeding, shorter hospitalization duration, faster recovery, less use of analgesics, and better cosmetic view of operation site [4, 5]. In addition, uterine artery sealing via LigaSure during hysterectomy is reported to be effective, safe, and fast leading to less intraoperative bleeding [6, 7]. In a study comparing two techniques, LigaSure vessel sealing device is reported to be as efficient as bipolar cauterizing in sealing uterine arteries [8].

LH may be a challenging operation in patients with enlarged uterus due to the distortion of the normal anatomy and limited view of the anatomic planes. In addition, increased vascularization in the large uterus makes the operation as more complicated due to increased risk of intraoperative bleeding. Less clear view of anatomic planes as a result of bleeding give rise to increased risk of adjacent organ damage until control of hemorrhage. On the contrary, despite difficulties of LH in patients with a large uterus, ad-

vantages have also been shown regarding postoperative morbidity [9, 10]. However, there are few studies on this concern and limited data regarding the safety of LigaSure use at LH in patients with large uterus. In the present study the authors did not observe any single vascular injury or other intraoperative complications in both groups.

In the present study, vaginal and laparoscopic steps are performed with the LigaSure vessel sealing system. Therefore the authors were able to assess the safety of LigaSure separately in both steps. Accordingly, they have demonstrated that LigaSure is an effective option in the control of bleeding during laparoscopic step. A previous study by Mistrangelo *et al.* [11] investigated the safety of LigaSure in patients undergoing vaginal hysterectomy. These authors confirmed that vaginal hysterectomy with LigaSure is a safe method in the large uterus with regards to intraoperative complication rates and postoperative recovery. However, the amount of intraoperative bleeding was not mentioned in that study. In contrast, the present authors have found an increased amount of intraoperative bleeding in group 1 at the vaginal step. They consider that increased amount of bleeding is due to increased traction of large uterus during the vaginal step, as they have seen while opening the uterine artery pedicles in some of their patients in group 1. Accordingly, they suggest gentle traction or morcellation of the uterus during vaginal step to reduce the amount of intraoperative bleeding.

A different study by Kriplani *et al.* [8] investigated the safety of LigaSure in patients with uterus weighing more than 250 grams who underwent TLH. They found longer operation time and higher amount of intraoperative bleeding in these patients compared to patients with smaller sized uterus. However, these authors concluded that LigaSure was a demandable energy modality as they found no difference in complication rates between the groups. A previous study by Hanlan *et al.* [12] also stated that TLH is a safe method in the large uterus. However, in this study energy modality used was not mentioned. A similar study by Alperin *et al.* [13] compared the safety of TLH and supracervical LH in regards to the uterus weight. These authors found that the mean operation time was 27 minutes longer in patients who had uterus weight more than 500 grams compared to patients with smaller sized uterus. Similarly, energy source was also not mentioned in this study.

In the present study, the authors have also found that laparoscopy step was longer in group 1 (uterine weight ≥ 300 grams) compared to group 2 (uterine weight ≤ 299 grams). They believe that longer operation time in group 1 was due to the limited mobilization of the uterus. Limited mobilization results in difficulties of dissecting the anatomic planes and securing the uterine arteries. Therefore at this

stage the authors spent more time to safely seal the uterine arteries which added additional minutes to the operation time. However, in the present study there was no significant difference in terms of intraoperative bleeding and complication rates between the groups. The authors believe that these findings show the safety of LigaSure in the large uterus at LH. They conclude that new energy modalities should be used in such cases and LigaSure is a good option for this.

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