



## ORIGINAL ARTICLE

## Laparoscopic hysterectomy of enlarged uteri in Zagazig University Hospitals.

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Submit Date 21-05-2019

Revise Date 28-06-2019

Accept Date 30-06-2019

## ABSTRACT

**Background:** The laparoscopic hysterectomy of enlarge uterus is a challenge to the surgeon irrespective of the surgical route. Big leiomyomas occupy the pelvis, thus decrease the ability to see the surrounding anatomic structures and partially impairing the surgeon's perform to correctly develop the pelvic spaces. The current work compares of laparoscopic hysterectomy for large uterus (weighing  $\geq 280$  gm) with an abdominal hysterectomy. **Methods:** This prospective interventional clinical study submitted from January 2015 to December 2018 to assess the perioperative outcomes of 60 consecutive women with an enlarged uterus (weighing  $\geq 280$  gm determined preoperative by ultrasound), of whom 30 underwent laparoscopic hysterectomy and 30 an abdominal hysterectomy, all for benign gynecological conditions after exclusion of contraindications to laparoscopy.

**Results:** Baseline patient characteristics were similar between the both groups, except for body mass index with laparoscopic group show higher index ( $34.3 \pm 1.3$  kg/m<sup>2</sup>). Among the perioperative complications, only the risk of ileus was significantly higher in the group that underwent abdominal hysterectomy. Laparoscopic hysterectomy shortened the length of hospitalization significantly but did not affect the operative time and blood transfusion. **Conclusion:** Total laparoscopic hysterectomy of enlarged uterus is a suitable effective alternative to traditional abdominal hysterectomy when the laparoscopic team is well trained. However, more studies are necessary before this technique can become routinely preconized.

**Keywords:** large uterus, laparoscopic hysterectomy, conventional hysterectomy.

## INTRODUCTION

Hysterectomy are common gynecological operation performed in the world, mostly for benign uterine diseases.[1]

Traditionally, hysterectomy technique is laparotomy or vaginal approach; however, laparoscopy has been rising since its firstly report in 1989 by Harry Reich and has become an alternative to abdominal hysterectomy. Advantages of the laparoscopy technique in comparison to abdominal one

includes lower intraoperative blood loss, shorter time of hospital stay, faster convalescence, in other hand longer operating times and more urinary tract injuries [2].

The removal of large uterus is difficult to the surgeon despite of the surgical approach used. Huge leiomyoma make the uterus difficult to manipulate, thus reducing the possibility to see the surrounding anatomic structures and partially impairing the surgeon's ability to correctly develop the pelvic spaces. There are

no agree about guidelines of large uteri, and the literature is vague regarding the best surgical technique in these cases [3].

Specimen can be removed more efficiently by many methods for volume reduction, including transvaginal volume reduction, laparoscopic morcellation, a combination of vaginal and laparoscopic procedures and minilaparotomy [4].

### METHODS

After IRB approval, Sample size was calculated by open EPI to be 60 cases with confidence level 95% and power of test 80%. This prospective interventional clinical study was submitted from January 2015 to December 2018, for the following indications: uterine leiomyomata, endometrial hyperplasia, adenomyosis, dysfunctional uterine bleeding. Hysterectomies performed for other pelvic malignancies, or together with any other major pelvic or abdominal surgery such as sacral colpopexy, sacrospinous ligament fixation, retropubic urethropexy, colpo-perineorrhaphy, and intestinal procedures, were excluded. a total of 60 patients underwent hysterectomy for enlarged uterus (weighing  $\geq 280$  gm determined preoperative by ultrasound), As a consequence, 30 patients were included in abdominal hysterectomy group and 30 in laparoscopic hysterectomy group. All patients were subjected to a detailed history, examination (general, abdominal and local) and investigation (laboratory, imaging, biopsy etc). Combined transabdominal and transvaginal ultrasound was performed with a 3.5 mHz and 7.5 mHz respectively to determine all 3 uterine dimensions. The uterine length (L) was the distance between the external cervical os to the dome of the fundus; the maximum width (W) and anteroposterior (AP) diameter were taken perpendicular to the axis of the uterine length. The ultrasound estimated uterine weight (UWT) was derived from the algebraic formula by Kung and Chang 1996 expressed in weights and measurements:  $\text{weight (g)} = 50 + (4/3 \times \pi \times L/2 \times W/2 \times AP/2)$ , This formula was further simplified to:  $\text{weight (g)} = L \times W \times AP \times 0.52$ . Written informed consent was obtained from all participants and the study

was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The work is carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

### Operative Technique:

- General anesthesia
- lithotomy position

### Surgical technique:

#### **Laparoscopic hysterectomy group**

The round and infundibulopelvic ligaments can easily be desiccated by using ligaSure instrument. Creation of the bladder flap, Securing the uterine arteries then cardinal ligament lastly open vaginal vault and extraction of uterus.

#### **Conventional hysterectomy group:**

A transverse incision the uterus and the adnexa are brought outside the abdominal wall. Two long, narrow abdominal retractors are used. Packing of the intestine is done. then securing uterine pedicle with conventional suture in order from above to down word.

These data were calculated and analyzed (operating time, blood loss and procedure related complications).

### **statistical analysis:**

The statistical software SPSS version 23 (SPSS Inc., Chicago, IL, USA) was used. Data was

represented in tables and graphs as mean + standard deviation, median and range for quantitative variables and as number and percentage for qualitative variables.

### **RESULTS**

Table 1. The p value in body mass index as shown in table 1 was significant with laparoscopic hysterectomy group ( $34.3 \pm 1.3$  kg/m<sup>2</sup>) in comparison to abdominal hysterectomy group ( $29.8 \pm 1.4$  kg/m<sup>2</sup>). Table 2. There is no difference was found between the two groups in ultrasound variables in both group as described in Table 2. Table 3. As shown in table 3. there was highly significant difference in the estimated blood loss among the two groups with group of laparoscopic hysterectomy having the least blood loss ( $110.1 \pm 30.8$  ml) in comparison to groups of conventional hysterectomy and There is no significance difference in intraoperative blood

transfusion and mean operative time between both groups. Table 4. There was a significant difference in the hospital stay among the two groups, the longest hospital stay occurred in abdominal hysterectomy group ( $63.8 \pm 5.7$  hours) versus laparoscopic hysterectomy group ( $20.7 \pm 2.5$  hours).also a significant difference was observed in first bowel movement in both groups, the faster occur in laparoscopic hysterectomy group ( $19.8 \pm 6.7$  hours) versus abdominal hysterectomy group ( $16.2 \pm 2.4$  hours).

The patient submitted to laparoscopic hysterectomy group for enlarged uterus .There were one patient had left ureteral

injury discovered postoperatively in day 4 double J ureteric stent inserted by cystoscopy then removed after one month after complete healing without any complication, abdominal wall hematoma in right ancillary port which resolved conservative and, postoperative febrile morbidity where as in. abdominal hysterectomy one patient had bladder injury (During pushing the bladder flap downwards, the injury occurred and repair was done with folly's catheter insertion for ten days with good healing.) ,ileus and vaginal stump infection ,three patient of wound seroma and infection ,five patient with postoperative febrile morbidity

**Table 1.** The preoperative demographic data for all of our patients.

Group of hysterectomy	Abdominal hysterectomy	laparoscopic hysterectomy	P value
Age (years) Mean $\pm$ SD	48.7 $\pm$ 3.9	48.5 $\pm$ 4.1	0.86
Parity	3.1 $\pm$ 2.1	3.5 $\pm$ 2.8	0.75
BMI (kg/m <sup>2</sup> ) Mean $\pm$ SD	29.8 $\pm$ 1.4	34.3 $\pm$ 1.3	0.0019*
Previous abdominal surgery including caesarean section	2	1	0.97

\*Statistically highly significant difference ( $P \leq 0.001$ )

Kg: kilogram

**Table 2.** Ultrasound variables of studied patient.

Variable	Abdominal hysterectomy	laparoscopic hysterectomy	P value
US length (cm) Mean $\pm$ SD	12.90 $\pm$ 1.42	13.42 $\pm$ 2.7	0.71
US width (cm) Mean $\pm$ SD	9.77 $\pm$ 0.9	10.24 $\pm$ 0.7	0.54
US AP (cm) Mean $\pm$ SD	8.75 $\pm$ 0.4	9.12 $\pm$ 0.6	0.45
US estimated weight (gm)	474.5 $\pm$ 192.7	454.5 $\pm$ 172.7	0.23

US: Ultrasound, SD: standard deviation, cm centimeter, gm: gram.

**Table 3.** operative details of hysterectomy (conventional hysterectomy vs. laparoscopic hysterectomy) for enlarged uterus.

	Abdominal hysterectomy	laparoscopic hysterectomy	P value
Operative time (minutes) Mean $\pm$ SD	84.7 $\pm$ 9.9	77.3 $\pm$ 7.8	0.15
Blood loss ( ml) Mean $\pm$ SD	170.3 $\pm$ 54.4	110.1 $\pm$ 30.8	< 0.001*
Hb Drop (gm/dL) mean $\pm$ SD	1.4 $\pm$ 0.9 gm/dl	0.7 $\pm$ 0.2 gm/dl	< 0.001*
Intraoperative blood transfusion	0	1	0.49

HB: hemoglobin, ml: milliliter, SD: standard deviation, gm: gram, dl: deciliter.

\*Statistically highly significant difference ( $P \leq 0.001$ )**Table 4.** Hospital stay, bowel movement and pain score in studied group.

	Abdominal hysterectomy	laparoscopic hysterectomy	P value
Hospital stay (hours) Mean $\pm$ SD	63.8 $\pm$ 5.7	20.7 $\pm$ 2.5	< 0.001*
Bowel movements (hours) Mean $\pm$ SD	19.8 $\pm$ 6.7	16.2 $\pm$ 2.4	< 0.001*
Pain score Mean $\pm$ SD	5.2 $\pm$ 1.1	3.8 $\pm$ 1.6	< 0.001*

\*Statistically highly significant difference ( $P \leq 0.001$ )

## DISCUSSION

For decades, abdominal and vaginal approaches accounted for the vast majority of hysterectomies. The advent of better laparoscopic technology resulted in the first total laparoscopic hysterectomy (TLH) in 1989 by Harry Reich [5]. Despite the advances of laparoscopic techniques, the majority of hysterectomies are still being done by the abdominal route (54.2%) or the vaginal route (19.7%). Use of laparoscopic hysterectomy has increased in the last 20 years, accounted for 13.6% of all hysterectomies in 2010. [6].

The removal of large uterus is difficult to the surgeon despite of the surgical approach used. Huge leiomyoma make the uterus difficult to manipulate, thus reducing the possibility to see the surrounding anatomic structures and partially impairing the surgeon's ability to correctly develop the pelvic spaces [3].

There is no agree about uterine weight should be accepted as indicating a 'large uterus' Different cut-off level of uterine weight have been accepted in multiple studies. O'Hanlan et al., 2011[7] used 250 g as a lower level; Yavuzcan et al. 2014 [8] used 280 g; and Smorgick et al., 2013 [9] used 500 g, Uccella et al., 2014 [3] suggested that the term 'enlarged uteri' should be used for uteruses > 1000 g. We used a lower limit of  $\geq 280$  g according to our facilities and experience and analyzed our data accordingly.

The present study we tried to find out that laparoscopic hysterectomy is accepted and safe even in case of enlarged uteri weighing  $\geq 280$  gm determined preoperative by ultrasound, and that a trend of increasing application of laparoscopic approach in this setting is associated with a decrease in terms of blood loss, post-operative hospital stay and peri-operative adverse events. All operations were performed by the one consultant and using the one procedure.

Overweight and co morbidities associated with it are a predisposing factor for vaginal bleeding, endometrial hyperplasia, adenomyosis, and so forth, many females of

higher BMI may require hysterectomy. In the past, laparoscopy was technically considered challenging in obese patients and was often considered a relative contraindication. But with significant advances in laparoscopic techniques this has come under review [10]. The p value in body mass index as shown in table 1 was significant with laparoscopic hysterectomy group ( $34.3 \pm 1.3$  kg/m<sup>2</sup>) in comparison to abdominal hysterectomy group ( $29.8 \pm 1.4$  kg/m<sup>2</sup>), Similarly as found in Osler M., etal 2011.

In this study, the Mean operating time was slightly but not significantly lower in laparoscopic hysterectomy group  $77.3 \pm 7.8$  than abdominal hysterectomy group  $84.7 \pm 9.9$ . However we observe Operative time of laparoscopic group showed considerable improvement with repetition of cases and progression in learning curve allover study.

There was highly significant difference in the estimated blood loss among the two groups with laparoscopic hysterectomy group having the least blood loss ( $110.1 \pm 30.8$  ml) in comparison to abdominal hysterectomy group have blood loss ( $170 \pm 54.4$ ). This significant reduction in blood loss was also reported in most of studies on this literature as in (11-7-3) this was explained by pneumoperitoneum compressing microcirculation, better visualization and magnification of smaller vessels added to the usage of LigaSure vascular sealing system.

The mean duration of first bowel movement postoperative in laparoscopic hysterectomy group was significantly lower than in abdominal hysterectomy group. Although that significant difference was reported in almost all studies in literature (7-3-14). That significant difference could be explained by less intestinal manipulation, less exposure to dryness. The mean time of hospital stay in the laparoscopic hysterectomy group was significantly lower than in abdominal hysterectomy group. Although that significant difference was reported in almost all studies in literature (7-12-13-3-14).

As regard the total incidence of intra-operative and postoperative complication of patient submitted to abdominal hysterectomy and laparoscopic hysterectomy group was significantly lower in laparoscopic hysterectomy group similar to finding in (14-11).

### CONCLUSION

Total laparoscopic hysterectomy of enlarged uterus is a suitable effective alternative to traditional abdominal hysterectomy when the laparoscopic team is well trained. However more studies are necessary before this technique can become routinely preconized.

### Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

**Funding information** None declared

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**To Cite This Article:** Mohammed AM, Mustafa MS, Azzam MN, El Sayed YA. Laparoscopic hysterectomy of enlarged uteri in Zagazig University Hospitals. *ZUMJ* 2020; 26 (2):307-312 Doi: 10.21608/zumj.2019.12654.1225.