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# Minilaparotomy for benign gynecologic conditions in patients with high body mass index: is it a suitable approach?

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Mahmoud Mohamed Abdelrazik<sup>1</sup>, Maher Shams<sup>1</sup>.  
<sup>1</sup> Department of Obstetrics and Gynaecology, Mansoura faculty of medicine, Mansoura university; Egypt.

## Abstract

**Objectives:** to assess the efficacy and outcome of minilaparotomy for management of benign gynaecologic conditions in patients with high body mass index.

**Patient and methods:** A retrospective study conducted on 64 patients at Mansoura university hospital. We analysed the outcome, perioperative and postoperative complications of minilaparotomy for benign gynaecologic conditions. All patients have a high BMI (more than 25 kg/m<sup>2</sup>).

**Results:** The mean operative time was 60.5±16.7 ranging from 30 to 90 minutes. The mean time for ambulation and postoperative hospital stay was 10.53±4.4 hours and 2.59±0.66 days respectively. The overall complications were 10.9% with no major complications. Conversion to laparotomy occurred in 3 patients due to adhesions in 2 patients and suspicion of malignancy in the third one. None of the patients required blood transfusion.

**Conclusion:** Minilaparotomy is a suitable option for the management of benign gynaecologic conditions in patients with high BMI.

**Keywords:** minilaparotomy, hysterectomy, myomectomy and ovarian cystectomy

## Introduction

Laparoscopy has been widely used in the management of benign adnexal masses and for hysterectomy (1-4). This is attributed to short hospital stay, early recovery and less postoperative pain. However, it is associated with high cost, long learning curve, the need of special experience and long operative time (5). Moreover, pneumoperitoneum could be contraindicated in morbidly obese patients and in some medical disorders (6).

In this context, Minilaparotomy could be an alternative to laparoscopy and also in places where the economic issue is of importance or lacks expertise in laparoscopy. It relies on the simplicity of traditional laparotomy technique avoiding the drawbacks of laparoscopy (7). It is well established technique for tubal sterilization (8). Many studies proved it as an accepted approach for hysterectomy for benign gynecological conditions (9, 10).

In this study we tried to explore the feasibility and outcomes of minilaparotomy for benign gynecologic condition in patients with high body mass index (BMI)

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### **Corresponding Author:**

Mahmoud Mohamed Abdelrazik.  
Lecturer of Obstetrics and Gynaecology, Mansoura faculty of medicine, Mansoura university; Egypt.  
Email: dr\_mahmoudhosam@yahoo.com  
Tel: 01005548881

## **Patient and methods**

This retrospective observational study was conducted on 64 patients over a period of 56 months from June 2014 to February 2019. Inclusion criteria were mobile uterus with a size up to 12 weeks and or benign ovarian masses in patients with high body mass index (more than 25kg/m<sup>2</sup>)

Exclusion criteria were suspected malignancy and suspected pelvic adhesions. Written informed consent was obtained from all the patients and the Departmental Ethical Committee approved the study. History taking, general, abdominal and pelvic examination were done for all patients. All patients followed the same standard preoperative protocol. All the operations were performed by at least one of the surgeons included as authors in this study. All surgeries were performed under general anesthesia with endotracheal intubation. Data that included age, parity, body mass index (BMI), diagnosis, size of the lesion on imaging or by examination, criteria of the lesion by ultrasonography, associated medical disorders and previous operations were collected. The data including duration of surgery, intraoperative blood loss, uterine weight, organ injuries, and conversion to laparotomy and relaparotomy were collected. Postoperative pain, need for analgesia, postoperative complications, time till the patient became ambulant and the duration of hospital stay were also collected. All patients received anticoagulant in the early postoperative period in addition to elastic stockings applied on both lower limbs.

**Surgical technique:** the surgery was started in supine position.

A transverse skin incision 4 to 6 cm was made 2 cm above the symphysis pubis. The subcutaneous fat was incised to expose the rectus sheath which was incised larger than the original skin incision. The recti muscles were retracted from the midline. The peritoneum was incised vertically and extended upwards and downward. The abdominal wall was then retracted using thin Deaver retractors. The uterus, adnexa were then examined to determine the extent of any unexpected pelvic pathology or adhesions. The operative table was then tilted to the Trendelenberg position of 30 degree and gentle packing was done to gain additional exposure.

For hysterectomy or myomectomy the uterus was exteriorized by applying gentle traction on the fundus by a tenaculum forceps and a double stitch was taken in the uterine fundus then gentle traction until delivery of the uterus through the wound was achieved. The hysterectomy or myomectomy was done in the traditional way. For hysterectomy, a straight Kocher's was applied on one side of the uterus including the origin of the tube and the round ligament. A Kocher's clamp is applied on the round ligament about 2 centimeters from the uterine end. The round ligament was then divided in between the 2 Kocher's and ligated. A window was done for application of an artery forceps on the infundibulopelvic ligament which is then sutured with a 1 polyglactin 910 suture. The dissection was then carried out between the two leaves of the broad ligament after gentle traction on ligated distal part of the round ligament to reach the peritoneal reflection on the upper surface of the bladder which was then incised.

The same technique was repeated on other side. Agauze was used to push the vesicocervical fascia down to expose the cervix, thereby pushing the ureters laterally. Next, the uterine pedicle is trans-fixed, and ligated.

At this point of dissection much of the uterus gets out of the surface. The lateral cervical ligaments were then divided and ligated figure (1). An incision was then carried out at the cervico-vaginal junction which was opened and the vaginal vault was held by a Kocher's clamp till the uterus was removed figure (2). The vaginal vault was repaired with polyglactin 910 and hemostasis was achieved. Figure (3)

For the large ovarian cysts which could not be extracted from the wound due to large size were deflated first. This was achieved through a bursae string suture in the surface of the cyst, after packing, avoiding piercing the wall, then a small incision 1 cm was done in the cyst wall while the tip of the suction catheter was introduced inside the cyst through the small incision and tightening of the opening around the catheter was done through traction of the two ends of the threads which then ligated to avoid escape of the cyst content into the peritoneal cavity. After deflation of the cyst it could be easily extracted from the wound where cystectomy and reconstruction of the ovary could then be performed.



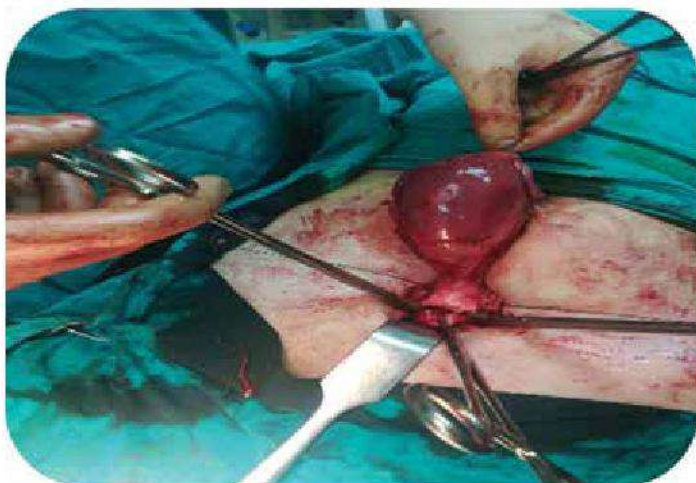
The parietal peritoneum was closed and the rectus sheath was closed with continuous suture. The skin incision was closed by applying interrupted or sub-cuticular sutures. A dressing over the incision was applied for 48 hours. All specimens were sent for histopathological examination. Intraoperative blood loss was estimated by the number of soaked packs and the amount in the suction bottle.

Blood transfusion was considered if the estimated blood loss was more than 500 ml. Patients were encouraged to become ambulatory as early as they can. Injectable antibiotics were given for 48 hours post-operatively and then replaced by oral tablets. Injectable non-steroidal anti-inflammatory drugs were given on demand for post-operative pain relief (3 doses in 24 hours at the most) and oral fluids were started on hearing the intestinal sounds, followed by semi-solids after another 12 hours.

The patients were discharged when ambulatory, passing urine normally, had normal bowel motion and had no complications.



**Figure (1): ligation of lateral cervical ligament**



**Figure (2): opening the vaginal vault**



**Figure (3): the vaginal vault is closed**



**Figure (4): the removed uterus**

### **Statistical analysis**

Data were fed to the computer and analyzed using IBM SPSS software package version 22.0. Qualitative data were described using number and percent. Quantitative data were described using mean and standard deviation for parametric data after testing normality using Kolmogorov-Smirnov test. Significance of the obtained results was judged at the 0.05 level and all tests were 2 tailed.

**One Way ANOVA test** was used for parametric quantitative variables, to compare between more than two studied groups with Post Hoc Tukey test for pairwise comparison. Monte Carlo test was used to compare qualitative variables when more than 25% of cells have count less than 5.



## **Results**

Sixty four patients were enrolled in our study. The patient's characteristics including age, parity and BMI in addition to associated medical diseases, previous surgery were described in table 1. the mean age was  $39.1 \pm 9.9$  ranging from 19 to 58 years. The mean BMI was  $33.63 \pm 4.58$  ranging from 28.1 to 39.2. Nineteen patients had previous surgery and 14 had an associated medical disorder the majority are diabetic or hypertensive.

The most common presenting symptom is abnormal vaginal bleeding and the most common indication for surgery was uterine fibroids. Table (2)

The operative data are presented in table 3. The mean size of ovarian cysts was  $9.13 \pm 4.53$ , ranging from 5 to 25 cm. The mean uterine weight was  $283.0 \pm 33.65$  ranging from 210 to 340 gm. Mean operative time was  $60.5 \pm 16.7$  ranging from 30.0 to 90.0 minutes, being least in ovarian cystectomy (table 4).

Estimated blood loss was  $<500$  cc and no patient required intraoperative blood transfusion. Estimated blood loss was less in the ovarian cystectomy group (table 4). Conversion to laparotomy occurred in 3 patients; 2 for extensive pelvic adhesions and one for suspicion of malignancy. No organ injury in our study population.

Table 4 illustrated the complications. The overall complication rate was (7/64) 10.9%. one case needed relaparotomy for parietal hematoma. Superficial wound infection was reported in 4 cases. Two cases developed fever (38.5c) 2 days after surgery. No reported cases with DVT.

## **Discussion**

The laparoscopic surgery is increasingly replacing the conventional laparotomy. However, to establish laparoscopic unit is costly. Moreover its practice needs special experience with long learning curve. Also laparoscopy carries a risk in patients with high BMI due to pneumoperitoneum. Learman (11) reported that the rate of major complications is higher in laparoscopic than abdominal hysterectomy (11.1% versus 6.2%). Again Aarts et al reported that laparoscopic hysterectomy is associated with more urinary tract injuries (12).

The results of our study show that minilaparotomy is a suitable surgical option for management of benign gynecological conditions in patients with

high BMI. It can be done with accepted blood loss, reasonable operative time without serious complications.

Many studies demonstrated the feasibility and safety of this technique (9, 10, 13, and 14) which relies on the simplicity of the traditional laparotomy and avoids the drawbacks of laparoscopy.

The stitch in the uterine fundus or the cyst wall allows the traction on the organ to be delivered through the small wound (4-6 cm) thus avoids introducing the hand inside the abdomen that decreases the capacity of the operative field. The advantages of this small skin incision are many including the small wound which acts as a tourniquet around the organ so avoids the exposure of the intestinal loops, thus decreasing the chance of intestinal injury and diminishes the possibility of postoperative ileus. Furstenberg has documented that avoiding repeated handling of the intestinal loops reduces the duration of postoperative ileus (15). Moreover getting the uterus outside through a small wound helps to avoid accidental injury of the ureters. This could explain the absence of organ injury in our patients.

Again a small wound decreases postoperative pain which allows early postoperative ambulation so decreases the risk of postoperative DVT being the complication of special importance in the population of our study.

Superficial wound infection was the most frequent complication in our patients. This may be explained by high BMI of the population of our study. All of them were managed conservatively with no need for resuturing.

Conversion to traditional laparotomy was done in 3 patients; 2 due to extensive pelvic adhesions and one for suspicion of malignancy that necessitated widening of the wound.

In the present study the mean operative time, time to ambulate were accepted. Blood loss was also accepted and there was no perioperative blood transfusion. No major complications were noticed in any of the patients, and the overall 10.9 percent complication rate could be considered low. Results of our study are comparable to other (9, 14). However, in our study the mean operative time for hysterectomy is longer than that reported by Mahendru et al (9). This could be explained by the higher

BMI of our study population which take longer time during opening and closure of the abdominal wall.

In our study minilaparotomy is a valid option for myomectomy and ovarian cystectomy. Other studies proved its feasibility for myomectomy (16, 17) and management of benign adnexal masses (1)

The disadvantage of the small wound is the difficulty to deal with adhesions due to the narrow window that does not allow optimal adhesiolysis. This explains the need to widen the incision in 2 cases due to the extensive adhesions.

This study is limited by its retrospective nature which might lead to possible bias but this was overcome by the performance of surgery by at least one of the two consultants included as authors in this study.

## **Conclusion**

Minilaparotomy for the management of benign gynaecological diseases in patients with high BMI can be safely done. It has an accepted operative time and reasonable blood loss with no serious intra or postoperative complications. Of importance is the associated tolerable postoperative pain and early ambulation that decreases the chance of developing postoperative DVT which is a complication of importance in obese patients. It is easy to learn than laparoscopy but has limitations in cases with extensive adhesions.

**Conflict of interest statement:** we declare that we have no conflict of interest.

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**Table (1): patient characteristics and indications for surgery**

Patient characteristics	n=64	%
Age/years Mean±SD (Min-Max)		39.19±9.9 (19.0-58.0)
BMI (Kg/m <sup>2</sup> ) Mean±SD (Min-Max)		33.63±4.58 (28.1-39.2)
Parity Mean±SD (Min-Max)		2.53±1.18 (0.0-5.0)
Previous surgery		
no	45	70.3%
yes	19	29.7%
Associated medical disease		
• No	50	78.1%
• DM	6	9.37%
• Hypertension	5	7.8%
• DM and hypertensive	1	1.5%
• Portal hypertension	1	1.5%
• RHD-MR	1	1.5%

**Table (2): presenting symptoms and indications for surgery**

	n=64	%
<b>Presenting symptoms</b>		
• Abdominal pain	25	39.1
• Chronic pelvic pain	6	9.4
• Menorrhagia	23	35.9
• Metrorrhagia	6	9.4
• Postmenopausal bleeding	4	6.2
<b>Indications for surgery</b>		
• Adenomyosis	5	7.8
• Dermoid cyst	3	4.7
• Endometrioma	3	4.7
• Endometrial hyperplasia without atypia	8	12.5
• Simple ovarian cyst	15	23.4
• Intramural fibroid	17	26.6
• Subserous fibroid	8	12.5
• Submucous fibroid	5	7.8

#Categories are not mutually exclusive

**Table (3): operative and postoperative data**

	n=64	%
Size of ovarian cyst/cm Mean±SD (Min-Max)	9.13±4.53 (5.0-25.0)	
Uterine weight /gm Mean±SD (Min-Max)	283.0±33.65 (210-340)	
Operation done		
Myomectomy	9	14.1
Ovarian cystectomy	20	31.3
TAH	4	6.20
TAH& BSO	31	48.4
Estimated blood loss		
<100	10	15.6
100-250	21	32.8
>250-450	33	51.6
Patients need blood transfusion	0	0.0
Operative time /minutes Mean±SD (Min-Max)	60.5±16.7 (30.0-90.0)	
Organ injury	0	0.0
Primary bleeding	0	0.0
Conversion to laparotomy	3	4.7
Analgesics dose Mean±SD	2.36±0.48	
Post operative ambulation time (hours) Mean±SD (Min-Max)	10.53±4.4 (6.0-24.0)	
Post operative hospital stay(days) Mean±SD (Min-Max)	2.59±0.66 (2-4)	

**Table (4): Comparison of estimated blood loss, operative time and time for ambulation between types of operations**

	Myomectomy N=9(%)	Ovarian cystectomy N=20(%)	Hysterectomy N=35 (%)	test of significance
Estimated blood loss <100 100-250 >250-450	0 3(33.3) 6(66.7)	9(45.0) 11(55.0) 0(0.0)	1(2.9) 7(20.0) 27(77.1)	MC P<0.001*†
Operative time /minutes Mean±SD	51.67±15.0	43.25±6.34	72.63±9.64	F=62.87 P<0.001#†
post operative ambulation time/ hours Mean±SD	10.22±4.1	10.20±4.9	10.80±4.3	F=0.14 P=0.87

\*Statistically significant difference between Myomectomy & Ovarian cystectomy ,# Statistically significant difference between Myomectomy & hysterectomy , † Statistically significant difference between Ovarian cystectomy &hystrectomy

F:One Way ANOVA test , MC :Monte Carlo test

**Table (5): complications**

	Number	%
Blood loss > 500 ml	0	0
Need for re-laparotomy	1	1.6
Post-operative DVT	0	0.0
Fever	2	3.1
Superficialinfections	4	6.2
Prolonged ileus	0	0
total	7	10.9