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ORIGINAL ARTICLE

Laparoscopic Management of Large Ovarian Cysts

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ABSTRACT

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Background: Laparoscopy is a novel surgical technique that combines elements of major and minor surgery. The use of ultrasonography (US) and other imaging techniques for abdominal and pelvic examination has led to a rise in the incidence of ovarian cysts seen in female patients who are asymptomatic in recent years. The present study aimed to evaluate the safety, the risks of laparoscopy in management of large ovarian cysts and the possible technical modifications to overcome the difficulties of the procedures. Methods: Twenty ptients were included in this study with large ovarian cysts ≥ 10 cm; of those twenty patients, laparoscopy was done in 17 cases (85%) and conducted at the Faculty of Medicine Tanta University Hospital. Results: The other three cases were first tried by laparoscopy that was failed and shifted to laparotomy; all of them was previous caesarian section and appendicectomy with dense pelvic adhesions. Laparoscopic management was successful for 17 (85%) women. No complications related to laparoscopy. The operative time of laparoscopically managed ovarian cyst ranged from 35-90 minutes. Six women managed by laparoscopic cystectomy, five women undergone laparoscopic cystotomy and six women had laparoscopic marsupialization. No postoperative complications occurred in laparoscopically managed cases and the length of hospital stay was 12 hours for women who underwent laparoscopy and 1 day for those converted to laparotomy. Conclusions: With good selection of cases and highly skilled operator, laparoscopy is not contraindicated in management of large ovarian cysts.

Keywords: Laparoscopic management, Ultrasonography, Large ovarian cysts.

INTRODUCTION

Laparoscopic approach as a minimally invasive surgery, minimizes overall exposure of the peritoneal cavity and entirely eliminates bowel manipulation, packing, and other sources of postoperative discomfort, also the laparoscopic approach has clear advantages as short hospitalization, rapid recuperation, superior cosmetic and the result at least equal to that obtained by laparotomy, also average reduction of 49% in overall hospital costs and the consequent saving to the community [1].

Compared to open laparotomy, laparoscopic surgery was linked to considerably reduced postoperative pain, fewer unfavorable consequences (surgical damage or postoperative problems), and a shorter hospital stay [2].

There are several challenges when using the laparoscopic method to remove ovarian cysts larger than 10cm in diameter, however the following are the most significant ones: Initially, when a trocar or Veress needle is inserted, the cysts burst and release their contents. Second, there is a restricted workspace and vision, which makes it challenging to locate crucial structures like the ureters. Third, the cyst is difficult to remove, and if there is a chance that it is cancerous, the contents of the cyst might leak out and spread [3].

In order to surgically treat benign ovarian cysts, laparoscopy is increasingly being used.

However, when the cysts are huge, it might be a difficult process. A randomized prospective laparoscopy trial comparing versus laparotomy for the treatment of patients with benign ovarian tumors smaller than 10 cm in diameter found substantial reductions in analgesic use, hospital stay, recovery time, and surgical morbidity. On the other hand, big cysts might potentially provide the same results [4]. With features from both small and major surgery, laparoscopy is a unique surgical technique. Though it is still an intraabdominal surgery, it has all of the same intraoperative and postoperative hazards as laparotomy, such as the possibility of infection, damage to nearby intra-abdominal structures, and harm to vascular sites [5].

AIM OF THE WORK

This study aimed to evaluate the hazards, clinical use, and safety of laparoscopy in the treatment of big ovarian cysts is the goal of the effort, along with potential technological changes to mitigate the procedure's challenges.

METHODS

Observational study included 20 patients, conducted at the Faculty of Medicine Tanta University Hospital from August 2024 to January 2025.The local research ethical committee at Tanta [acuity of medicine (institutional research board "IRB") approved the study with IRB number [36264PR947]. Informed written consent was obtained from each participant, confidentiality and personal privacy was respected at all levels of the study. The study follows the Helsinki Declaration (1975), which is the World Medical Association's guideline of ethics for research involving human subjects.

Inclusion criteria were patients subjected for gynecological diagnostic laparoscopy having large ovarian cysts ≥ 10 cm with CA 125 < 35u/ml. chocolate cyst measuring 4 centimeters or more. Exclusion criteria were patients with suspected malignancy and any women with a history of cardio-respiratory disorders or any physical findings or disease history that puts her at increased risk of anesthetic and surgical complication, cardiac or respiratory disease should be excluded.

Procedures: Standard antiseptic preparation Vaginal and abdominal skin preparation with

Positioning:

In order to provide vaginal access for uterine manipulation and other vaginal operations, the patient was initially in the modified lithotomy posture for the insertion of the Veress needle and the main trocar. The patient was put in the Trendelenburg position to prevent the bowel from entering the pelvis following the successful insertion of the main trocar. Veress needles of different lengths were used through the main puncture site. Pre-insertion security test are used for confirmation of intraperitoneal placement of the Veress needle. After ensuring security tests, pneumoperitoneum was started with adjustment of the intraperitoneal manometer pressure at 14-20 mmHg. The primary trocar was introduced after complete successful pneumoperitoneum. Exploring the abdominal cavity for the site of entrance, presence of intraperitoneal adhesion, also exploring the anterior surface of the liver was done. Assess the pelvis for endometriosis, adnexal mass, any uterine abnormalities, adhesions or any pelvic pathology and determination of tubal patency also was done. Evaluation of the ovarian cyst for laparoscopic removal regarding the size, consistency and suspected malignancy was done.

The incision must be made on the antimesenteric surface, as far as possible from the ovarian hilus, after a cleavage plane between the cyst wall and ovarian cortex was identified, the ovaries were pulled slowly and gently in opposite directions by means of two atraumatic grasping forceps. After removing the pseudocapsule from the abdominal cavity, if needed selective minimal (15 watts) bipolar coagulation of bleeding was performed.

Histopathological assessment: Histopathological assessment for cyst wall to confirm endometrioma and exclude any possibility of malignancy.

Postoperative care: All patients were discharged the day after surgery; broad spectrum antibiotic and analgesic treatment were only prescribed. Patients are instructed to come back at 7-10 days postoperatively for stitch removal, wound inspection and follow up after the first month, the third month and the sixth month postoperatively

In the present work: no need for drain

Methods of extrusion: after the cyst was removed from the ovary, an endoscopic bag was then advanced through the umbilical 10-12 mm port, and the cyst is placed in the bag. The bag was then advanced up to the umbilical incision, and the port was removed while advancing the edges of the bag through the skin incision. The bag was then opened and triangulated to facilitate removal of the cyst intact and those which were small enough or with morcellation carefully avoiding any spillage out of the bag. Prior to removal, the cyst was drained while in the bag. Once the specimen was small enough, the bag was removed with the specimen through the incision

Statistical analysis:

The collected data was coded, processed, and analyzed using SPSS version 25 for Windows[®]. The qualitative data were represented using relative percentages and frequencies. Use the X^2 -test to ascertain how two or more sets of qualitative variables vary from one another. The quantitative data was expressed as mean \pm SD. The independent samples t-test was used to compare two distinct sets of parametric data, or normally distributed variables. А p-value was considered significant if it was 0.05 or less.

RESULTS

Twenty patients were included in this study with large ovarian cysts ≥ 10 cm. The general characteristics of those patients (table 1).

The mean age of patients of the study population was 24.6 years (19–30 years). Of **Table (1):** Characteristics of the patients who up

those twenty patients, laparoscopy was done in 17 cases (85%). The other three cases were first tried by laparoscopy that failed and shifted to laparotomy; all of them had a history of previous caesarian section and appendicectomy with dense pelvic adhesions. Of those 20 patients, 7 patients (35%) were diagnosed as dermoid cyst, 6 patients (30%) were diagnosed as simple serous cyst,6 patients (30%)were diagnosed as endometrioma and one patient (5%) was diagnosed as mucinous cystadenoma. Cases of laparotomy were significantly higher age group than cases of laparoscopy (P = 0.025). Cases of laparotomy were significantly higher parity than cases of laparoscopy (P = 0.001) (table 2).

Ninety percent (18/20) of the ladies had previously had benign disease-related abdominal surgery. For 17 (85%) of the ladies, laparoscopic treatment was effective. There were no issues with the trocar placement or Veress needle. Three (15%) of conversions to laparotomies had the significant adhesions and technical issues. The duration of surgery for an ovarian cyst treated laparoscopically varied from 35 to 90 minutes. Six patients received laparoscopic marsupialization, five had laparoscopic cystotomy, and six had laparoscopic cystectomy. For instances treated laparoscopically, there were no postoperative problems, and women who had laparoscopic procedures spent 12 hours in the hospital, whereas those who had laparotomies spent one day there (tables 2, 3).

Table (1): Characteristics of the patients who underwent laparoscopy or laparotomy

	N=20
Age (years)	
Mean \pm SD	24.6 ± 3.5
Parity	
Mean \pm SD	1.5±0.76

Tuble (2). Companison between Euparotomy and Euparoscopic cases						
	Laparoscopy N=17	Laparotomy N=3	Р			
Age (years)						
Mean \pm SD	23.88±3.29	28.7	t = 2.42			
Range	19-29	27-30	0.025*			
Parity						
Mean \pm SD	1.23 ± 0.43	3.0±0.0	t = 6.83			

Table (2): Comparison between Laparotomy and Laparoscopic cases

	Laparoscopy N=17	Laparotomy N=3	Р
Range	1-2		0.001*
Diagnosis			
Dermoid	5 71.4	2 28.6	$X^2 = 8.8$
Simple ovarian cyst	6 100.0	0 0.0	0.03*
Chocolate cyst	6 100.0	0 0.0	
Mucinous cyst	0.00	1 100.0	
Past history			
Irrelevant	2 100.0	0 0.0	$X^2 = 1.51$
Appendicectomy	4 100.0	0 0.0	0.46
Appendicectomy & C. S	11 78.6	3 21.4	

Table (3): Comparison between cases of laparoscopy

	Cystectomy	Cystotomy	Marsupialization	Р
	n=6	n=5	n=6	
Age				
Mean ± SD	25.8±3.8	21.2±1.8	24.2±2.4	F = 3.63
Range	19-29	19-23	20-27	0.05*
Parity				
Mean \pm SD	1.2±0.04	1±0	1.5 ± 0.05	F = 2.17
Range	1-2		1-2	0.15
Operative Time				
Mean ± SD	69.2±20	41±6.5	61.7±6.8	F = 6.56
Range	45-90	35-50	55-70	0.009*



Fig. (1): Large dermoid cyst 12 cm.



Fig. (2): Large paratubal cyst 15 cm.



Fig. (3): Large simple cyst 11 cm.



Fig. (4): Ovarian cystectomy of a large dermoid cyst 11 cm.

DISCUSSION

The majority of ovarian tumors, both benign and malignant, are cystic. The occurrence of ovarian cysts changes very little with patient demographics, ranging between 5 and 15% [6].

By using laparoscopic techniques, which are minimally invasive surgical methods, lessen overall peritoneal cavity exposure, eliminate Elhamamy, N., et al the need for bowel handling and packing, and prevent additional sources of postoperative discomfort [7]. Additionally, there are some obvious benefits of laparoscopy, including short hospital stays, quick recovery times, better cosmetic outcomes, and results comparable to laparotomies [7].

Our study aimed to evaluate the safety, the risks of laparoscopy in management of large

ovarian cyst and the possible technical modifications to overcome the difficulties of the procedures. A total of 20 patients with ≥10 ovarian cysts cm with large gynecological complaints of increased abdominal girth, chronic pelvic pain and irregular cycles were chosen for laparoscopic procedures. There were no complications in our study which go in agreement with Machida et al. [8].

As shown by Machida et al. [8] who examined potential barriers to laparoscopic surgery for this clinical entity and discovered that the size of the ovarian tumor had no discernible impact on the prevalence of perioperative complications or the likelihood of conversion to open surgery. This study stated that laparoscopic surgery for a large ovarian tumor ≥ 10 cm is feasible and safe.

In our study, many different techniques were used for laparoscopic management of ovarian cyst. Cystectomy was done for 6 patients (30%), cystotomy was done for 5 patients (25%) and marsupialization was done for 6 patients (30%). In our study, 3 of our patients (15%) were shifted to laparotomy.

Despite its obvious benefits, laparoscopy has not been utilized very often to treat ovarian cysts. Many people steer clear of this method due to worries about higher rates of cyst rupture with the possibility of tumor leakage and malignant seeding. Nevertheless, several researchers have shown the safety of laparoscopic oophorectomy and cystectomy as described by a research on a series of 186 laparoscopically handled big adnexal masses. This study found that 174 (93.5%) of the ladies had effective laparoscopic treatment. Malignancy (n = 5) and expected technical difficulty (n = 7) were the reasons for conversion to laparotomy; all research participants experienced no intraoperative problems [9].

Sufficient laparoscopic skills, appropriate preoperative evaluation, and patient be counseling continue to essential components of effective laparoscopic care of large, possibly malignant ovarian tumors. Despite using different technique, another study agreed with our study for laparoscopic management of giant ovarian cysts. According to Dubuisson et al. [10], in certain

patients, the Alexis Laparoscopic System can be used as a mini-invasive surgical method for the removal of large benign ovarian cysts. This procedure has a short recovery period and no particular risks during or after surgery. In our study, ninety percent (18/20) of the ladies had previously had benign diseaserelated abdominal surgery. For 17 (85%) of laparoscopic treatment was ladies. the effective. There were no issues with the trocar placement or Veress needle. Three (15%) of conversions to laparotomies had the significant adhesions and technical issues. The duration of surgery for an ovarian cyst treated laparoscopically varied from 35 to 90 minutes. Six patients received laparoscopic marsupialization, five had laparoscopic cystotomy, and six had laparoscopic cystectomy. For treated instances laparoscopically, there were no postoperative problems, and women who had laparoscopic procedures spent 12 hours in the hospital, whereas those who had laparotomies spent one day there.

A method for laparoscopically assisted extracorporeal cystectomy or adnexectomy of big adnexal cysts without spilling the cyst contents was reported in a research by Lee et al. [11]. Twelve patients, including four cystadenomas, one serous cystadenoma, three dermoid cysts (one of whom was a pregnant woman who gave birth to a healthy baby at term naturally), two low malignant potential ovarian tumors, and one grade I endometrioid adenocarcinoma, were successfully treated with this technique. However, our study showed successful laparoscopic management in 17 cases with only benign pathologies.

Another study by Vizza et al. [12] was carried out to determine the feasibility and outcome of laparoscopic surgery for 25 patients with extraordinarily large ovarian cysts utilizing the SAND balloon catheter. This study found no serious surgical complications. Only one incidence (4%) of intraabdominal cyst fluid leaking was noticed during the surgical operation, which lasted 60 (30-300) minutes. A retrospective analysis by Hong et al. [13] was performed of the medical records of 52 women who underwent laparoscopic surgery for large ovarian tumors whose maximum diameter was \geq 15cm and a low possibility of malignancy. The median tumor diameter was 17cm (range 15-40). There were no conversions to laparotomy and perioperative complications. The surgical techniques done were salpingo-oophorectomy (n=26), ovarian cystectomy (n=16), laparoscopically assisted vaginal hysterectomy with unilateral or bilateral salpingo-oophorectomy (n=9), and laparoscopically aided staging surgery (n=1). The histological findings included mucinous cystadenoma (n=25), mature cystic teratoma cystadenoma (n=9), serous (n=6), endometrioma (n=5), mucinous borderline tumor (n=4), follicular cyst (n=2), and clear cell carcinoma (n=1). They concluded, in line with our findings, that laparoscopic therapy of big ovarian tumors is possible and efficient with adequate patient selection and surgical skill.

It might be difficult to prevent rupture or contents spilling into the peritoneal cavity when big ovarian cysts are removed laparoscopically. Whereas material from a mucinous cyst may cause pseudomyxoma peritoneii, spillage from a dermoid cyst may cause an extensive inflammatory response and the production of peritoneal adhesions [14].

Some surgeons performed only laparoscopic procedures on ovarian cysts that were less than 10 cm in size [15]. The use of laparoscopy in the surgical treatment of benign ovarian cysts has grown in popularity. Even yet, if the cysts are huge, it is a difficult process. A randomized prospective study comparing laparoscopy and laparotomy in the treatment of patients with benign ovarian tumors smaller than 10 cm in diameter found significant reductions in operating morbidity, postoperative pain and analgesic requirement, hospital stay, and recovery period. However, big cysts can potentially have the same outcomes [9].

There are several challenges when using the laparoscopic method to remove cysts larger than 10 cm in diameter, but the following are **REFERENCES**

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the most significant ones: Initially, when a trocar or Veress needle is inserted, the cysts burst and release their contents. The authors advocate using an open procedure and a Hasson trocar in close proximity to the umbilicus. Before the procedure, they did not aspirate the cyst. According to a recent literature review, some writers prefer to reduce the size of cysts before laparoscopy. This may be accomplished in a few different ways, including by utilizing the Bonanno catheter or ultrasonography-guided aspiration [3].

Second, there is a restricted workspace and vision, which makes it challenging to locate crucial structures like the ureters. Third, the cyst is difficult to remove, and if there is a chance that the contents may leak, it might spread and cause problems where the trocars were inserted [3]. Because of its benefits, which mostly center on protecting ovarian tissue and reducing the formation of postoperative adhesions in women of reproductive laparoscopic age. ovarian surgery has become the procedure of choice [16].

CONCLUSION

According to the current study, most big adnexal tumors can be safely removed laparoscopically if the surgeon has gained the necessary skill. The mass size may not be the most crucial factor when deciding between a laparoscopic and open method; rather, it may be the surgical team's experience, the patient's readiness, and quick access to an accurate frozen section diagnosis.

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