Laparoscopic management of benign adnexal masses: Two years' experience

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Abstract

Objective:Our objective is to evaluate the safety and reliability of laparoscopy in the management of benign adnexal masses in patients with diversity of presentations through a retrospective study.

Methods:We analyzed data from 41 patients who were admitted to King Abdulaziz Hospital, Obstetrics and Gynecology Department through outpatient clinic, emergency department and referred from other hospitals. All patients were diagnosed as benign adnexal mass and underwent laparoscopy for both diagnostic confirmation and management. Laparoscopy was performed after fulfillment of the diagnostic work up of benign adnexal masses.

Results: All the study cases were operated successfully by operative laparoscopy. High BMI , pregnancy, and large adenexal masses were not limitations for the procedure. Fertility potentials were preserved in most of cases Long operative time was noticed. Operative and post operative parameters were comparable to former studies.

Conclusion: Laparoscopic approach can be considered the gold standard surgical approach for the management of benign adnexal masses. It can be offered for patients who want to preserve their fertility potential. It can be successfully performed on patients with benign adnexal masses regardless of the size of the mass and with low risk in patients with intraperitoneal adhesions when done by skilled team.
Keywords:Laparoscopy, benign, adnexal masses, management.

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Introduction:

Adnexal masses are common clinical problem affecting women of all ages [1]. Women with adnexal masses may present with acute torsion or rupture of cystic lesions and peritoneal signs that require immediate surgical intervention; however, the vast majority of cases are discovered incidentally during imaging or pelvic examination [2,3]. Laparoscopy has the potential to completely and successfully treat benign adnexal masses while decreasing unnecessary morbidity among patients [1]. As far as benign ovarian pathology is concerned, laparoscopy is superior to laparotomy in terms of visualization of abdominal contents and for adequate inspection of contralateral adnexa [4]. Previous studies showed favorable surgical outcomes of laparoscopy such as, less intraoperative bleeding, short recovery time, better cosmetic effect, decreased adhesions formation and maintaining patient's future fertility prospects when managing benign adnexal lesions [1,4,5]. This retrospective study investigates and discusses the value of laparoscopy in the diagnosis and management of benign adnexal masses.

Materials and methods:

A retrospective study was carried out on 41 patients admitted to Obstetrics and Gynecology Department, King Abdulaziz Hospital, through outpatient clinic, emergency department, or referred from other hospitals between January 2018 and April 2020. The preoperative diagnostic work up of benign adnexal masses was done for all patients. Laparoscopy was performed for diagnostic confirmation and management.

Inclusion criteria:

*All patients diagnosed with benign adnexal mass followed by laproscopy were included in this study in years between 2018 to 2020. Data were collected from patients' files provided by **King Abdulaziz Hospital, Obstetrics and Gynecology Department.** Demographic data and clinical history (age, marital status, obstetric code, BMI, concomitant pregnancy, and history of previous laparotomy) as well as patient presentation, laparoscopic access, findings, procedure, operative time, intraoperative complications, early and late postoperative complications, hospital stay, size of the mass and histopathology data were collected.*

Preoperative assessment of adnexal masses was performed for all patients by full medical history, complete physical examination, imaging (either CT scan or MRI and standard sonographic pelvic assessment were performed to all the patients) and biomarkers evaluation.

Possibility of malignant conditions was eliminated depending on a combination of the following: i-All standard sonographic criteria adopted by the International Ovarian Tumor Analysis Group

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except color Doppler (no M features). ii- Negative biomarkers of ovarian malignancy (ca125, alpha fetoprotein, ca19.9 and beta HCG). iii- Pelvic CT Scan or MRI. iv- Cases that showed intraoperative findings suggestive of malignancy were excluded[6-10]. Pregnancy test by serum level of beta subunit of HCG was done to roll out ectopic and intrauterine pregnancies.

Laparoscopy was performed via one of the following access techniques [11]: i- Umbilical with veress needle. ii- Left upper quadrant (palmer's technique) with veress needle. iii- Umbilical with open technique (Hasson). iv- Direct trocar insertion of primary port.

Severity of the patients' postoperative shoulder and abdominal pain was evaluated at rest using the 10-point visual analogue scale (VAS) at 6 h and 24 hours after surgery [12]. The VAS consists of a non-graduated 10 cm line ranging from 0 for "no pain at all" to 10 for "Extreme pain". Patients were asked to give a score corresponding to their perceived pain. The   postoperative analgesia was offered to all patients using one or two postoperative narcotic doses followed by two or three systemic non-steroidal doses.

Routine preoperative investigations, preparation and concentingwere offered for all patients that matches the hospital policy and procedure curriculum. All surgeries had been performed by laparoscopy team of gynecologists affiliated to the Obstetrics and Gynecology Department. All patients included in the study attended postoperative clinic over several weeks.

Ethical considerations

The study was approved by the organization and operating procedures of the research and study adminstratin- Directorate of health Affairs-Jeddah- Institutional review board (IRB) in compliance with the good clinical practice guidelines (approval IRB registration number (H-02-j-002).

Statistical analysis:

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, standard deviation, median and interquartile range (IQR).

Results:

By analyzing the patient characters and demographic data (Table I), the age indices (range 16-47, mean ± SD 31.83 ± 7.94, median 32) indicate that almost all of our patients are in the reproductive age group and hence, fertility potentials should be preserved and the incidence of malignant adnexal lesions was unlikely. Body mass index (BMI) showed that 54% (22 cases) of cases are either obese or overweight. From all the examined cases, only two were pregnant.

Operative findings and their percentages among the total number of cases showed that the most prevalent finding is ovarian cyst 39 cases (95%) followed by adnexal torsion 11 cases (26.83%). Only two cases diagnosed as adnexal lesions and found to be pseudocyst (table II).

A variety of data enrolled in this study was represented (table III). Pain is the most common presentation (65.9%). Dermoid cyst is the most prevalent pathological condition (36.6%). Fertility potentials and ovarian function are respected. Cystectomy was done for 29 (70.7%) cases, adnexal untwist done for seven cases (17.1%) and adnexectomy done for only seven cases (17.1%). The laparoscopic access technique used in most of cases is the classic umbilical veress needle (27 cases, 67.5%).The mean ± SD of operation time is (122 ± 68.15) minutes with a very wide range (50-440) minutes. Postoperative hospital stay is one day in the majority of cases with mean value ± SD (1.3±0.86) day.

The postoperative evaluation of pain in both the abdomen and the shoulder at rest, using the 10-point visual analogue scale (VAS) at 6 h and 24 hours after surgery was recorded (table IV).

Discussion:

Adnexal masses are commonly encountered in obstetric and gynecological practices, affecting women of all ages [1].The range of age in our study group was 16- to 47 years old with a mean of 31.83.That indicates that the incidence of benign adnexal masses is highest among women in reproductive age group[5]. Dermoid cyst is most common in 2nd and 3rd decades of life [13], hence it represents 36.6% (15 cases) of all studied cases.

Despite the fact that most of adnexal masses are detected incidentally during physical examination or imaging [6], acute or intermittent pain was the most common presenting symptom in our patients 65.9% (27cases).

Laparoscopy is essential for both completion and confirmation of diagnostic work up of adnexal masses [1]. Two cases out of 41 patients were misdiagnosed preoperatively as adnexal masses while they were found to be an encysted pelvic collection by laparoscopy (pseudocyst). If torsion adnexa is suspected, timely intervention with diagnostic laparoscopy is indicated to preserve ovarian functions and fertility potential [14]. In this study, seven cases out of 11 diagnosed as adnexal torsion were managed with laparoscopic detortion with or without cystectomy. Adnexectomy was performed for the four remaining cases due to extensive ovarian necrosis and/or fertility preservation was not desired by the patient.

Most of the cases with adnexal masses in this study were obese or overweight. That was indicated by high BMI with a mean of 26.65 ±6.46. Unlike the increased likelihood of laparotomies among obese patients noted by Thomas, D et al; (2006) [15], all the cases included in this study are performed uneventfully.

Only two mid-trimester pregnant cases were included in this study. Both patients' final diagnosis was mucinous cystadenomas with torsion adnexa in one of them. Both patients were operated

successfully by laparoscopic cystectomy. Several studies documented laparoscopy during pregnancy and concluded that it is the preferred approach in the second trimester when maternal-fetal risk deemed minimal. However, laparoscopy can be performed safely at any point during the pregnancy. Nevertheless, it may be impractical towards the later stages of pregnancy [16].

Whereas ovarian cysts > 8 cm in diameter are best managed by laparotomy, others have challenged for this notion [17, 18]. Three cases were involved in this study with big ovarian cysts exceeding 14 cm in diameter. One case was preceded by sonographic guided aspiration to reduce its size [17]. Open access "Hasson technique" was used for two of them and umbilical verses needle access for one case.

Spillage of cystic contents in the peritoneal cavity during laparoscopy is a common and a challenging event [17]. Dermoid cyst contents carry the risk of chemical peritonitis [19]. Mucinous cystadenoma rupture and fluid spillage increase the risk of recurrence and pseudomyxomaperitonei formation [20,21]. In our study, dermoid cysts (N=15) and mucinous cystadenomas (N=5) comprised nearly 50% of cases. Spillage cannot be completely avoided in most of the cases but its risk can be minimized by using copious fluid suction and irrigation and the use of laparoscopic retrieval bag device for collection and removal of cystic contents. In this study, no cases presented with any of the formerly mentioned complications.

Characteristics of the patients (age, BMI, history of other operations, parity and others) and operation characteristics (bilaterality of the lesion, adhesions, size and number of cysts) are variables contributing to the duration of the procedure [22]. Our mean ±SD operation time was 122.44 ±63.15 minutes with a median of 120 minutes are longer than reported in former studies by Gambadauro et al. (2015) [23] (mean= 75.14 minutes) and Shushan et al. (1999) [22] (mean= 72 minutes). The wide range (50 - 440 minutes) as well as the diversity of pathological types and the small number of our cases for each type, limit deeper statistical analysis to identify and explain the relevance of variables to the longer operation time indices. The non-surgical activities during the procedure were also contributing factors.

Laparoscopic entry techniques and technologies include the classic pneumoperitoneum with veress needle, the open (Hasson) technique, the direct trocar insertion, and visual entry system [24]. In addition to the classic technique in the periumbilical area, we used three access techniques for our cases respecting the evidence obtained from previous reviews. Open (Hasson) technique was used for large masses [25], left upper quadrant (Palmer's technique) access was performed for suspected adhesions or hernias in the periumbilical area and direct trocar entry was considered a safe alternative to veress needle access technique [24].

Apart from one case complicated by trocar site bleeding and controlled by Foley's catheter tamponade, no intraoperative complications were recorded in all the cases operated in this study. Postoperative drain was inserted in only 5 out of 41 cases. Postoperative drain insertion is preferred whenever there was massive spillage of cystic contents and after removal of large sized cysts [12]. Blood loss was minimal in all cases (less than 100 ml). Mean ±SD postoperative VAS scores were 2.1±1.2 after 6 hours and 0.7±0.6 after 24 hours for shoulder pain, and they were

4.2±2.3 after 6 hours and 2.5±2.1 after 24 hours for abdominal pain. Postoperative pain scoring was consistent with that found in other studies[12, 26, 27].The mean ±SD time for postoperative stay was 1.37±0.86 day and the median was 1 day that matches or even shorter than the results in other reviews [12, 27]. Neither early (within the first 24 hours after the procedure) nor late (after 24 hours) postoperative complications as fever, wound infection and bleeding were recorded during two months follow up in our outpatient clinic.

Conclusion:

Laparoscopic approach is the gold standard surgical approach for the management of benign adnexal masses. It is safe, feasible and reliable in terms of minimal intraoperative and postoperative complications, reduced postoperative pain and shorter hospital stay. It should be offered for patients who want to preserve their fertility potential. Pregnancy, size of adnexal mass, and risk of intraperitoneal adhesions are not limiting factors when performed by skilled team.

A conflict-of-interest statement:*There is no conflict of interest to disclose.*

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Table (I): Distribution of cases with benign adnexal masses according to patients' characteristics.

Patients' characteristics(n = 41)	No. (%)
Age (years)	
<30	17 (41.5%)
30 – 40	18 (43.9%)
>40	6 (14.6%)
Min. – Max.	16.0 – 47.0
Mean ± SD.	31.83 ± 7.94
Median (IQR)	32.0 (27.0 – 37.0)
Marital status	
Single	12 (29.3%)
Married	28 (68.3%)
Divorced	1 (2.4%)
BMI (kg/m²)	
Normal	19 (46.3%)
Overweight	11 (26.8%)
Obese	11 (26.8%)
Min. – Max.	32.0 – 47.80

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Mean ± SD.	*26.65 ± 6.46*
Median (IQR)	*25.20 (22.8 – 30.10)*
Current pregnancy	*2 (4.9%)*
Parity	**23 (56.1%)**
Min. – Max.	*1.0 – 6.0*
Mean ± SD.	*3.35 ± 1.64*
Median (IQR)	*3.0 (2.0 – 4.50)*
Abortions	**9 (22%)**
Min. – Max.	*1.0 – 4.0*
Mean ± SD.	*2.0 ± 0.87*
Median (IQR)	*2.0 (2.0 – 2.0)*
Vaginal deliveries	**15 (36.6%)**
Min. – Max.	*1.0 – 6.0*
Mean ± SD.	*3.13 ± 1.60*
Median (IQR)	*3.0 (2.0 – 4.0)*
Caesarian sections	**10 (24.4%)**
Min. – Max.	*1.0 – 5.0*
Mean ± SD.	*2.80 ± 1.62*
Median (IQR)	*2.50 (1.0 – 4.0)*
Nationality	
Non Saudi	*9 (22%)*
Saudi	*32 (78%)*
History of other laparotomy	*2 (4.9%)*

BMI: body mass index, Min: minimum, Max: maximum, SD: standard deviation, IQR: interquartile range

Table (II): Distribution of the studied cases according to operative findings (n = 41).

	No. (%)
Bilateral ovarian cyst	*2 (4.88%)*
Unilateral ovarian cyst	*37 (90.24%)*
Right	*26 (63.41%)*
Left	*11 (26.83%)*
Tortionadenexa	*11 (26.8%)*
Hemorrhagic cyst	*4 (9.8%)*
Hydrosalpinx	*1 (2.4%)*
Psudocyst	*2 (4.9%)*
Ruptured cyst	*1 (2.4%)*
Adhesion	*8 (19.5%)*
Gangrenous	*2 (4.9%)*

Table (III): Distribution of the studied cases according to different parameters. (n = 41)

	No. (%)
Presentation	
Accidental	7 (17.1%)
Pain	27 (65.9%)
Swelling	5 (12.2%)
Infertility	6 (14.6%)
Access technique	
Direct	4 (9.8%)
Open	9 (22%)
Conventional	27 (67.5%)
Palmer	1 (2.4%)
Histopathology	
Dermoid cyst	15 (36.6%)
Corpus leutium cyst	4 (9.8%)
Endometrioma	1 (2.4%)
Serous cystadenoma	4 (9.8%)
Mucinous cystadenoma	5 (12.2%)
Others	11 (26.8%)
Paraovarian cyst	1 (2.4%)
Intervention	
Cystectomy	29 (70.7%)
Adenexectomy	7 (17.1%)
Untwist	7 (17.1%)
Adhesolysis	7 (17.1%)
Others	8 (19.5%)
Drain	5 (12.2%)
Hospital stay (days)	
Min. – Max.	1.0 – 5.0
Mean ± SD.	1.37 ± 0.86
Median (IQR)	1.0 (1.0 – 1.0)
Operation time (minutes)	
Min. – Max.	50.0 – 440.0
Mean ± SD.	122.44 ± 68.15
Median (IQR)	120.0 (90.0 – 130.0)

Min: minimum, Max: maximum, SD: standard deviation, IQR: inter quartile range
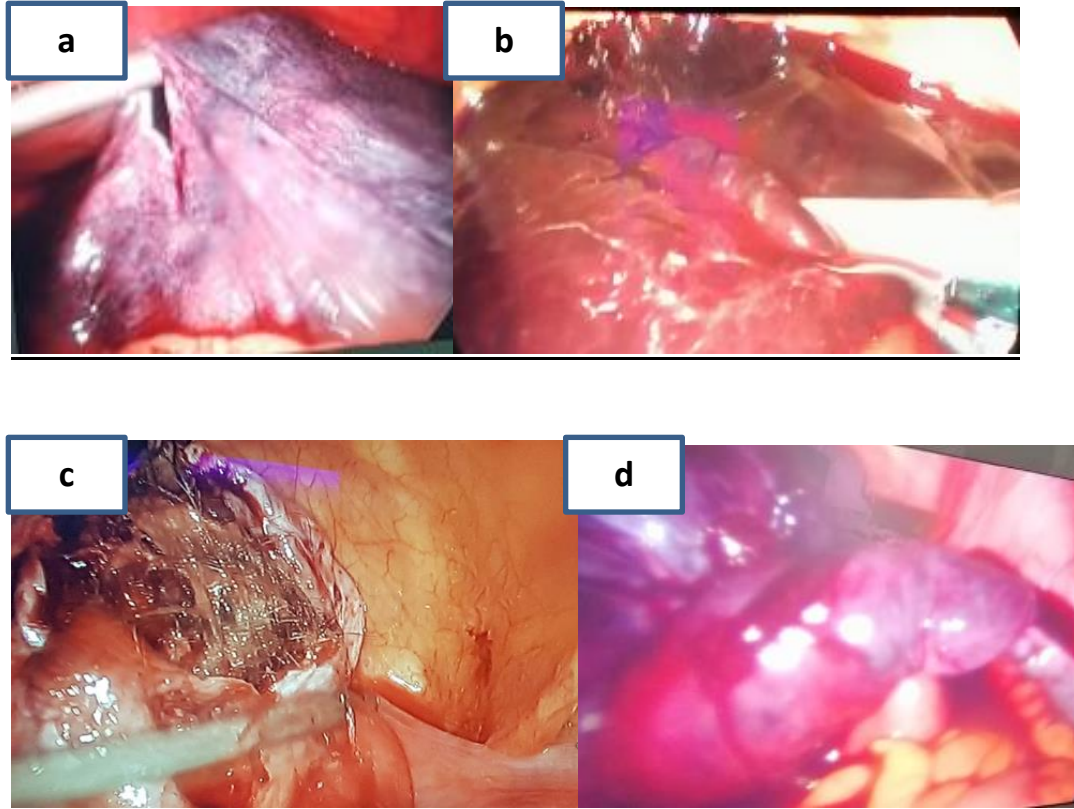
(Table IV): Postoperative shoulder and abdominal pain scores according to the visual analogue scale (VAS) (n=41).

Postoperative pain (No=41)	Mean ±SD
6 hours	
Abdomen	4.2±2.3
Shoulder	2.1±1.2
24 hours	
Abdomen	2.5±2.1
Shoulder	0.7±0.6

SD: standard deviatio

Figure 1

Legends of Figure

Figure 1: benginadenexal masses managed by laparscopy a- Cystectomy of huge ovarian cyst >10 cm b-Large paraovarian cyst c- Laparoscopic cystectomy of benign cystic teratoma d- Twisted larger ovarian cyst

List of tables:

List of abbreviations:

CA: Cancer antigen.
HCG: Human chorionic gonadotropin.
CT: Computed tomography.
MRI: Magnetic resonance imaging.
VAS: Visual analogue scale.
BMI: Body mass index.
M features: Malignant features