



Laparoscopic Evaluation and Management of Benign Adnexal Masses

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Abstract

Introduction: Benign adnexal masses can be effectively managed by laparoscopy. Laparoscopy provides the advantage of diagnosis and therapy at the same time. The risk of ovarian malignancy in women undergoing laparoscopy for preoperatively benign appearing ovarian tumors ranges from 0.1 to 4.2%. The promises of less postoperative pain, faster recovery, and lower costs have driven patients demand, and more gynaecologic procedures are now performed laparoscopically than in past.

Material and Methods: 35 patients with benign adnexal masses were included in the study needing surgery as per inclusion and exclusion criterion. Diagnostic laparoscopy was followed by operative laparoscopy. Per op diagnosis was compared with histopathology. Surgical procedure, time taken, blood loss, preoperative and postoperative complications were studied and recorded.

Results: The mean age of patients was 30 ± 7.33 years, majority being nullipara. Simple serous cyst (28.5%) and dermoid (17.1%) were the common preoperative diagnosis. Laparoscopic Cystectomy (31.43%) and cystectomy with chromopertubation (22.86%) were the most common procedures performed. Majority of the procedures was completed between 60-90 min. Mean blood loss was found to be 46.86ml. Conversion to laparotomy (11.43%) and cyst rupture (5.7%) were the most common per op complications. Laparoscopic diagnosis was found to be excellent for dermoid (sensitivity 100% specificity 100%), hemorrhagic cyst (sensitivity 100% specificity 100%), paraovarian cyst (sensitivity 100% specificity 100%), good for simple serous cyst (sensitivity 83.33% specificity 83.33%) and mucinous cyst (sensitivity 50% specificity 96.56%).

Conclusion: Laparoscopic management of benign adnexal masses is safe effective and is both diagnostic and therapeutic at the same time. Post operative complications are negligible and in properly selected cases finding a malignancy is rare.

Key Words: Laparoscopic management, Benign adnexal masses, laparoscopic complications.

Introduction

The adnexa of the uterus include the ovaries, fallopian tubes, and the structures of the broad ligament. Most frequently, adnexal masses refer to the ovarian masses or cysts; however, paratubal

cysts, hydrosalpinx, and other non-ovarian masses are also included.¹ The prevalence of adnexal masses is 0.17% to 5.9% in asymptomatic and 7.1% to 12% in symptomatic patients.² Benign adnexal masses can be of various types. In

premenopausal women, physiologic follicular cysts and corpus luteum cysts are the most common adnexal masses³. Other masses in this age group include endometriomas, tubo-ovarian masses and benign neoplasms.

The evolving laparoscopic technology has enabled endoscopic management of most adnexal masses. Most adnexal masses are benign, yet it is difficult to accurately assess the nature of adnexal masses preoperatively. Though ultrasonography is good in assessing adnexal mass but it does not tell us in detail the nature of mass, the exact location and origin of adnexal masses. Thus diagnostic laparoscopy is the modality of choice by which adnexal masses can be evaluated correctly and can be managed at the same time as per the requirement. As most adnexal masses are benign, laparoscopic management has become a standard procedure, especially for those with low risk of malignancies, because the incidence of unsuspected cancers discovered at the time of laparoscopy is very low. The risk of ovarian malignancy in women undergoing laparoscopy for preoperatively benign appearing ovarian tumors ranges from 0.1 to 4.2%³.

The promises of less postoperative pain, faster recovery, and lower costs have driven patients demand, and more gynaecologic procedures are now performed laparoscopically than in past⁴.

Material and Methods

This study was carried out in a tertiary level hospital. It was a prospective observational Study. 35 patients with benign adnexal masses needing surgery (malignancy excluded), were admitted in our hospital for surgical treatment.

Patients had preoperative evaluation including detailed history, examination, investigations followed by Transvaginal sonography to confirm the nature of cysts and serum CA-125 levels.

All the patients were posted for diagnostic laparoscopy and proceed for operative laparoscopy under general anaesthesia.

The cases were followed with particular interest in the indication, preoperative assessment, surgical

methods, operative time, blood loss, pre and postoperative complications. Conclusive confirmation for nature of adnexal masses was done by histopathological examination for the specimens removed in all cases

Inclusion criteria

1. All patients with symptomatic benign adnexal masses (mainly- abdominal or pelvic pain, menstrual disturbances).
2. Asymptomatic patients with persistent adnexal masses detected incidentally, either on per vaginal examination or on ultrasonography.
3. All surgically fit patients with benign adnexal masses.
4. Ultrasonographic features of benign adnexal masses- Unilateral, cystic with distinct border, and no evidence of ascites.

Exclusion criteria

1. Patients with benign adnexal masses for conservative management.
2. Adnexal masses with clinical and ultrasonographic features of suspected malignancy:

All the procedures were performed under general anaesthesia. Diagnostic laparoscopy was done and pelvic structures including uterus, tubes ovaries and the mass were inspected followed by inspection all peritoneal surfaces. Peritoneal fluid for cytology was taken. Depending on the pelvic condition, two or more trocar sites were made in the area of lower abdomen.

Adhesiolysis, cystectomy, salpingectomy, neosalpingostomy, fimbrioplasty, chromopertubation or a combination of these procedures were done as per need. Specimens were retrieved through an indigenous bag made of glove. If there was a spillage adequate suctioning and peritoneal washing was done to prevent chemical peritonitis.

The operating time from skin incision to closure was recorded in all procedure. The amount of blood loss was assessed and noted. The intraoperative complications like cyst rupture, bladder, bowel injury; if any; if any; were noted.

If a laparoscopy had to be converted to laparotomy, then factors responsible for it were noted.

In the post operative period, the patients were reviewed for any complications like fever, urinary tract infection, wound sepsis, etc. The duration of post-operative period hospital stay was noted. All the relevant data were tabulated and graphically represented. The mean and standard deviations were calculated and compared. Sensitivity, specificity and diagnostic accuracy of laparoscopic diagnosis of adnexal masses was calculated.

Results

Maximum patients were in age group of 30-40. The mean age of patients being 30±7.33 and the range was 20-40. Maximum number of patients was nulliparous (14/35). This may be associated because infertility was the most common problem in the studied population. The history of previous abdominal surgery was present in 5 patients. One patient had previous history of appendicectomy. Two patients had history of laparoscopic ligation. One patient had history of laparotomy for ectopic pregnancy. One patient had history of open cholecystectomy

Table: 1 Preoperative diagnosis of adnexal masses

PROPERATIVE DIAGNOSIS	NUMBER OF PATIENTS
DERMOID	6
ENDOMETRIOTIC CYST	5
HEMORRHAGIC CYST	4
HYDROSALPINX	1
MUCINOUS CYST	2
PARAOVRIAN CYST	7
SIMPLE SEROUS CYST	10

Simple serous cyst was the most common diagnosis in 10/35 patients (28.5%) followed by dermoid cyst seen in 6/35 (17.1%) patients. Mean level of CA -125 was 17.44 and standard deviation was 15.01.

Table 2: Distribution According to Procedure Done

PROCEDURE	Frequency	%
Cystectomy	11	31.43
Cystectomy+Adhesiolysis	4	11.43
Cystectomy+Bilateral tubal ligation	5	14.29
Cystectomy+Chromopertubation	8	22.86
Cystectomy+Neosalpingostomy	1	2.86
Cystectomy+Ovariectomy	1	2.86
Cystectomy+Combination of procedure	2	5.71
Cystectomy+Salpingectomy	2	5.71
Oophorectomy	1	2.86
TOTAL	35	100

Cystectomy (31.43%) and cystectomy with chromopertubation (22.86%) were the most common procedures performed.

Table 3: Distribution According to Duration of Procedure

Duration of Procedure (min)	Freq.	%
60 – 90	23	65.71
90 - 120	5	14.29
≥ 120	7	20.00
TOTAL	35	100
Mean	92.00	
Std. Dev	17.79	

Mean duration was found to be 80 minutes with standard deviation of 17.79. Majority of the procedure was completed between 60-90 min. The procedure which were converted to laparotomy took >120 min.

Table 4: Distribution According to Blood Loss

Blood Loss	Freq.	%
25 - 50	20	57.14
50 - 100	11	31.43
≥ 100	4	11.43
TOTAL	35	100
Mean	46.86	
Std. Dev	33.48	

The amount of blood loss during the procedure was assessed quantitatively, which ranged from 25-200 ml. Mean blood loss found to be 46.86 and standard deviation was 33.48. The procedure which was converted to laparotomy had more blood loss.

Table 5: Distribution According To Per-Op Complications

Per-op complication	Freq.	%
Cyst rupture	2	5.71
Bowel Injury	0	0.00
Bladder Injury	0	0.00
Conversion to Laparotomy	4	11.43
Iatrogenic perforation of uterine fundus	1	2.86
No complications	28	80.00
TOTAL	35	100

One mucinous cyst and one serous cystadenoma were ruptured. However, the peritoneal cavity was thoroughly irrigated with normal saline to prevent chemical peritonitis. No case of chemical peritonitis was seen in postoperative period.

One case was iatrogenic perforation at the uterine fundus,, which was repaired laparoscopically, no post operative complication was seen in the patient.

Four of the procedures were started as laparoscopy, but had to be converted to laparotomy. In all four of them reason to conversion to laparotomy was due to dense adhesions. Two out of four had history of abdominal and genital tuberculosis, thus there were dense adhesions and matted bowel loop obscuring the mass on diagnostic laparoscopy. No case of malignancy was found intraoperatively and on histopathology.

Table 6: Distribution According to Postoperative Hospital Stay

Hospital Stay(days)	Freq.	%
1 - 3	6	17.14
3 - 5	22	62.86
≥ 5-7	7	20.00
TOTAL	35	100
Mean	3.49	
Std. Dev	1.48	

The average duration of hospital stay of the patient was 3.49±1.49. The range being 1-7 days. Patient in whom the procedure had to be converted to laparotomy had to stay longer.

Table 7: Distribution According to Post-Operative Complications

Postop Complications	Freq.	%
No complications	30	85.71
Fever	2	5.71
UTI	1	2.86
Wound Sepsis	2	5.71
TOTAL	35	100

Most of the patient (85.71%) had no complication in postoperative period. Two out of 35 had fever in day one of surgery, no cause was found and resolved by antipyretic alone and one patient had urinary tract infection, which on culture found to have growth of E.COLI sensitive to nitrofurantoin and responded to treatment. Two patients had wound sepsis, who had undergone laparotomy.

Table 8: Distribution According to Laparoscopic Diagnosis and Its Comparison to Histopathology

Laparoscopy	Histopathology								
	ENDOMETRIOTIC CYST	HEMORRHAGIC CYST	HYDROSALPINX	DERMOID	MUCINOUS CYSTA DENOM A	PARAOVARIAN CYST	SEROUS CYSTA DENOM A	SIMPLE SEROUS CYST	TO TA L
Dermoid	0	0	0	5	0	0	0	0	5
Endometriotic cyst	4	0	0	0	0	0	0	0	4
Hemorrhagic cyst	0	4	0	0	0	0	0	0	4
Hydrosalpinx	0	0	2	0	0	0	0	0	2
Serous cystadenoma	0	0	0	0	0	0	5	0	5
Mucinous cyst	0	0	0	0	1	0	0	1	2
Simple serous cyst	0	0	0	0	1	0	0	5	6
Paraovarian cyst	0	0	0	0	0	7	0	0	7
Total	4	4	2	5	2	7	5	6	5

Discussion

Most women in our study group belonged to reproductive age group; the range being 20-39 years. The mean age of the patients was 30.63 ± 7.33 years. Most of the patients in our study were nulliparous (40 %).

In our study there was high prevalence of patients with infertility (42.86%). Majority of the patients presented with chronic pelvic pain (62.86%) and only few with acute abdominal pain (5.71%).

The history of previous abdominal surgery was present in five patients;. In the patient with previous laparotomy for ruptured ectopic, laparoscopic surgery failed and had to be converted to laparotomy due to dense adhesions and in other case with previous history of open cholecystectomy, laparoscopic surgery failed which was because of dense adhesion due to presence of endometriosis. In the study done by Dottino et al⁵, 30% of the patients had one previous abdominal surgery, and 18% had two or more such surgeries. Pittaway et al⁶ reported 58% of patients with previous history of pelvic surgery. Previous history of surgery did not considerably affect the outcome in our study; however, in the reported studies it did influence the outcome.

The size of adnexal masses in our study varies from 4 to 10 cm. The mean and standard deviation being 7 ± 2.1 cm which is very similar to study by Mais et al⁷, where the mean diameter of cyst was 6.7 ± 1.6 cm.

Laparoscopy set the diagnosis correctly in all the cases of dermoid cysts, paraovarian cyst, hemorrhagic cyst, hydrosalpinx and paraovarian cysts in our study. Laparoscopy was less accurate in the description of the nature of simple serous and mucinous cystadenomas, and endometriotic cyst, although the lower sensitivity laparoscopy exhibits in these cases is mostly unimportant, because it does not alter the conservative surgical approach that consists of ovarian cystectomy in such cases.

Laparoscopic diagnosis was found to be excellent for dermoid (sensitivity 100% specificity 100%), hemorrhagic cyst (sensitivity 100% specificity

100%), paraovarian cyst (sensitivity 100%, specificity 100%), good for simple serous cyst (sensitivity 83.33%, specificity 83.33%) and mucinous cyst (sensitivity 50%, specificity 96.56%)

The most common procedure done was cystectomy (31.43%). Adhesiolysis was done in 11.43%. Cystectomy+Salpingectomy(5.7%) was done in case of paraovarian cyst. Combination of procedure was done in 5.7% of cases. Oophorectomy (2.86%) was done in case of hemorrhagic cyst. Cystectomy with chromopertubation (22.86%) was done for patient seeking treatment for infertility. In the study done by Harvilesky et al⁸, ovarian cystectomy was done in 18% of cases; cyst drainage was done in 3.5%, salpingectomy was done in 3%, and lysis of adhesions in 8% of cases.

Surgical Outcome

The estimated blood loss was 46.86 ± 33.48 ml in the laparoscopic procedure. The amount of blood loss was approximately 72 ml in the study on laparoscopic adnexectomy done by Pittaway et al⁶. The incidence of cyst rupture was 5.7% in our study. It is worthwhile to note that chemical peritonitis due to spillage, has been found to be very low (0.2%), as reviewed by Shawki et al⁹.

The mean duration of surgery was 80 ± 17.79 minutes in the present study, which is comparable to the study done by Ki Hyun Park et al¹⁰, where the average duration was 94.5 ± 6.6 minutes. The average duration was 73 minutes in the study by Hidelbaugh et al¹¹. The mean operating time was 88 minutes in the study by Pittaway et al^{6,7,3}.

The laparoscopic removal of adnexal masses was successfully completed in 31 cases(88.57%) of cases undertaken. Four cases had to be turned to laparotomy all due to presence of dense adhesions. In the study by Konno et al¹², one out of 19 cases had to be converted to laparotomy due to severe adhesions. Ki Hyun Park et al¹⁰ has reported 6% conversion to laparotomy, all in cases of endometriomas. Various studies have reported many complications like bladder and bowel

injury, hemorrhage, hematoma formation, but these complications were not seen in our study. Higher rate of complications in these studies may be due to associated procedures like concurrent hysterectomy.

Two patients reported fever within 24 hours of cystectomy for paraovarian cyst; however it resolved with antipyretics. One patient had urinary tract infection postoperatively but it resolved with antibiotic treatment. Two patients had wound sepsis (where laparotomy was done) Yuen et al¹³ has reported 5.8% febrile morbidity, 3.8% urinary tract infection in the post-operative period in their study.

The average duration of hospital stay was 3.49 ± 1.45 days, ranging from 1 to 7 days, which is more as compared to 1 day of hospitalization reported by Pittaway et al⁶. In the follow up period all the patients were satisfied with the surgery and no cases of recurrence were seen in the follow up of 3 months.

Conclusion

Laparoscopic management of benign adnexal masses is a safe procedure. It is a diagnostic option and at the same time optimum therapeutic treatment can be carried out. Chances of malignancy in properly selected cases are negligible.

Source of support/Grant: NIL

References

1. Khanna A, Garg S, Shukla RC, Kumar M. Color Doppler Study for Differentiation of various Adnexal Masses. Singapore Journal of Obstetrics and Gynecology 2002;33:35-9.
2. NIH Consensus Development Panel on Ovarian Cancer. NIH consensus conference. ovarian cancer : screening, treatment and follow-up. JAMA. 1995;273:491-497.
3. Nezhat F, Nezhat C, Welandar CE, Benigno B. Four ovarian cancers diagnosed during laparoscopic management of 1011 women with adnexal masses. Am J Obstet Gynecol. 1992;167:790-796.
4. Mais V, Ajossa S, Piras B, Marongiu D, Guerriero S, Melis GB. Treatment of nonendometriotic benign adnexal cysts: a randomized comparison of laparoscopy and laparotomy. Obstet Gynecol. 1995 Nov;86(5):770-4.
5. Dottino P, Levine D, Ripley D. Laparoscopic management of adnexal masses in premenopausal and postmenopausal women. Obstet Gynecol. 1999;93:223-228.
6. Pittaway D E, Takacs P, Bauguess P. Laparoscopic adnexectomy: A comparison with laparotomy. Am J of Obstet Gynecol 1994 ; 171(2):385-391.
7. Mais V, Guerriero S, Ajossa S, Angiolucci M, Paoletti AM, Melis GB. Transvaginal ultrasonography in the diagnosis of cystic teratoma. Obstet Gynecol 1995; 85: 48-52.
8. Havrilesky LJ, Peterson BL, Dryden DK, Soper JT, Clarke-Pearson DL, Berchuck A. Predictors of clinical outcomes in the laparoscopic management of adnexal masses. Obstet Gynecol. 2003 Aug;102(2):243-51
9. Shawki et al. Laparoscopic management of ovarian dermoid cysts Middle East Fertility Society Journal 2004 Vol. 9, No. 1:58-65
10. Park KH, Chung JE, Kim JY, Lee BS. Operative laparoscopy in treating benign ovarian cysts. Yonsei Med J. 1999 Dec;40(6):608-12.
11. Hidlebaugh DA, Vulgaropoulos S, Orr RK. Treating adnexal masses. Operative laparoscopy vs. laparotomy. J Reprod Med. 1997 Sep;42(9):551-8.
12. Konno R, Nagase S, Sato S, Fukaya T, Yajima T. Indications for laparoscopic surgery of ovarian tumors. Tohoku J Exp Med. 1996 Mar;178(3):225-31.

13. Yuen PM, Yu KM, Yip SK, Lau WC, Rogers MS, Chang A. A randomized prospective study of laparoscopy and laparotomy in the management of benign ovarian masses. *Am J Obstet Gynecol.* 1997 Jul; 177(1):109-14.