

Laparoscopic Evaluation of Adnexal Masses in Reproductive Age Group

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Abstract: Adnexal masses are one of the most common pathologies among women of all age groups. The aim of the present study was to study laparoscopic diagnosis of adnexal masses in the reproductive age group and to study the spectrum of diverse pathology of adnexal masses in the reproductive age group. Methods: This was a cross-sectional study conducted at Prathima Institute of medical sciences, Karimnagar. 50 subjects between the ages of 18 to 40 years i.e. Reproductive age group were selected for the study, with clinically suspected adnexal masses and ultrasonographically diagnosed adnexal masses. In all cases detailed history was taken and Bimanual pelvic examination was done for assessment of uterine size in weeks, mobility of uterus, size of adnexal mass in cms, characteristics of mass such as surface, mobility and consistency, tenderness, and fullness in fornices and pouch of Douglas, nodules in pod was also noted. Ultrasound preferably trans-vaginal ultrasound was performed in the Department of Radiology in PIMS. Laparoscopy was performed under general anesthesia. The specimen was obtained and sent for histopathological examination and nature of the mass was finally confirmed by histopathological examination. Results: In this study of 50 patients, 68% are in the age group between 21-40 years and only 32% are between 18-20 years 56% were parous ladies and 20% were nulliparous. In the ultrasonography the most common finding was ovarian cyst 36% patients, 18% had torsion ovarian cyst, 18% PCOD, 12% had To mass, on laparoscopy most common finding was ovarian cyst 24% torsion ovarian cyst seen in 18%, endometriotic cyst in 8%, gangrenous ovarian cyst in 4%, dermoid in 2%, tubo-ovarian mass in 8%, Hydrosalpinx in 10%, Fimbrial cyst in 4%, para ovarian cyst in 6%, broad ligament fibroid in 2%, endometriotic nodules found in 4%, adhesions in 20%, free fluid in POD found in 24%. Conclusion: Evaluation of adnexal masses in the reproductive age group is of prime importance and mandatory for appropriate management. Laparoscopy has shown to be the definitive tool for evaluation in surgical management of these masses. Ultrasonography is an adjunct tool which may aid in the diagnosis. Majority of adnexal masses in the reproductive age group are benign in nature.

Keywords: Laparoscopic Evaluation, Adnexal Masses, Reproductive Age.

INTRODUCTION

The term adnexa is derived from the plural form of the Latin word meaning "appendage." Adnexal mass refers not only to ovarian abnormalities but also to masses originating in the fallopian tube, uterus, bowel, urinary system and retroperitoneum. It has been estimated that 5 to 10% of women in the United States will undergo a surgical procedure owing to a suspected ovarian mass during their lifetime, and 13 to 21% of these women will suffer from malignancy. [1] Up to 300000 women are hospitalized each year for evaluation of an adnexal mass. The prevalence of adnexal masses is 0.17% to 5.9 % in asymptomatic and 7.1 to 12% in symptomatic patients [2]. Differential diagnosis of adnexal masses include ovarian causes like

Functional cyst, Endometriosis, ovarian neoplasm, Ectopic pregnancy and tubal causes like Tubo ovarian mass, Hydrosalpinx, Para tubal cyst, Ectopic pregnancy, Neoplasms, Tuberculous salpingitis. Others are uterine myomas, sarcomas, pregnancy and gastrointestinal causes like the Appendicular abscess, Diverticular abscess, and Colonic tumor.

The prevalence of acute abdomen in the reproductive age group needs to be evaluated by proper diagnostic modalities. Diagnostic modalities available for the evaluation of the above conditions are pelvic scan, Trans-vaginal scan. Diagnostic laparoscopy emerged as a safe and effective adjunct to TVS in the evaluation and surgical management of adnexal masses.

The advantage of laparoscopy is that a definitive surgical procedure like cystectomy, oophorectomy or removal of Tubo ovarian mass, adhesiolysis can be performed in the same sitting. A combination of TVS and laparoscopy is useful for improving the diagnostic accuracy. The clinical evaluation of adnexal mass should focus on determining whether the mass is benign or malignant and whether the mass can be removed without any complications. No single test is available to evaluate these parameters, therefore, age, history, symptoms, physical examination, laboratory findings, and diagnostic imaging should be important 6 step evaluation parameters before the management of an adnexal mass in every age group. In the reproductive age group, the majority of adnexal masses are benign, with malignancy found only in 7% to 13% [3]. Functional cysts remain the most common type of adnexal mass found in this age group. In the differential diagnosis of the reproductive age patient, ectopic pregnancy, pelvic inflammatory disease, Hydrosalpinx, leiomyoma should always be kept in mind. Over the last decade, advances in laparoscopic techniques have led to increased use of laparoscopy in gynecologic surgery. As the technology improved, low complication rates for operative laparoscopy in such procedures as adnexectomy have been reported [4]. Despite the advantages of using laparoscopy to manage adnexal masses, there remains the fear of encountering cancer and performing inadequate staging or worse yet, upstaging of the disease by tumor seeding. Careful patient selection for the appropriate use of laparoscopy in the management of adnexal masses is a critical issue. Therefore, we in the present study did a laparoscopic evaluation of adnexal masses in the reproductive age group and study the spectrum of diverse pathology of adnexal masses in the reproductive age group.

MATERIALS AND METHODS

This was a cross-sectional study conducted at Prathima Institute of Medical Sciences, Naganoor, Karimnagar in the Department of Obstetrics and Gynecology after taking clearance from the ethical committee of the institution. 50 subjects between the age of 18 to 40 years i.e. Reproductive age group were selected for the study, with clinically suspected adnexal masses and ultrasonographically diagnosed adnexal masses. Inclusion Criteria: Clinically suspected adnexal masses in the reproductive age group 18 to 40 years. Ultrasonographically diagnosed adnexal masses. Adnexal masses with failed medical/conservative treatment were included. Adnexal masses of size 5 to 10 cms with failed conservative management with normal CA-125 levels. Exclusion Criteria: Adnexal masses >12cm size. Adnexal masses with solid components and thick septations on ultrasonography. Adnexal masses with elevated CA-125 >200 m IU/ml. Pregnancy with adnexal masses and ectopic pregnancy. Patients with contraindications for laparoscopy such as morbidly

obese patients, those with BMI >35 or underlying cardiac or pulmonary diseases were excluded.

In all cases, a detailed history was taken and general physical examination and systemic examination including per abdominal examination was done for any palpable mass. Per speculum examination was done to rule out cervical and vaginal pathology such as infection, erosion, polyp, abnormal growth, discharges, bleeding. A bimanual pelvic examination was done for assessment of uterine size in weeks, the mobility of uterus, size of an adnexal mass in cms, characteristics of mass such as surface, mobility and consistency, tenderness, and fullness in fornices and pouch of Douglas, nodules in the pod was also noted. Per rectal examination was done where indicated. Routine blood investigations, X-RAY, ECG was done. Urine pregnancy test was done to rule out ectopic pregnancy when there is suspicion of ectopic pregnancy. Ultrasound preferably trans-vaginal ultrasound was performed in the department of radiology in PIMS. Entire pelvis and lower abdomen in both transverse and longitudinal planes were scanned. CA-125 estimation was done in all cases.

Laparoscopy was performed under general anesthesia by open laparoscopy method with a 10 mm Karl Storz 30 degree angle laparoscope. The second puncture was established in every case lateral to rectus muscle to improve visualization and careful evaluation of entire pelvic peritoneum along with manipulation of pelvic organs. A third port was established similarly on the other side whenever an operative procedure was undertaken. Depending on pathology adhesiolysis, fulguration of endometriotic lesions, cystectomy, salpingectomy, salpingo-oophorectomy, ovarian drilling was done in the same sitting after obtaining informed consent. And the specimen was sent for histopathological examination and nature of the mass was finally confirmed by histopathological examination. Data were recorded on a pre-designed proforma. A master chart dealing with all aspects has been designed and presented. The analyzed data were compared with other series of literature and discussed.

RESULTS

In this study of 50 patients, 68% are in the age group between 21-40 years and only 32% are between 18-20 years. 56% were parous ladies and 20% were nulliparous. Rests of the cases were unmarried i.e. not sexually active. The socioeconomic status has been calculated by the modified Kuppaswamy scale. According to that 62% patients belongs to class 4 socioeconomic status, 30% of patients belong to class 3.8% patients belongs to class 2. In this study, the most common symptom was pain abdomen in 36% patients, followed by non-specific symptoms 24%, irregular cycles 12%, infertility 12%, dysmenorrhoea 8%, dyspareunia 8% cases given in table 1.

Table-1: Clinical Features

Clinical Features	CASES	PERCENTAGE
Pain Abdomen	18	36%
Irregular Cycles	06	12%
Dysmenorrhoea	04	8%
Dyspareunia	04	8%
Infertility	06	12%
Non-Specific	12	24%

Only a few patients had risk factors like H/o PCOS in 8% patients, H/o PID in 6% patients, H/O usage of drugs like ovulation induction drugs in 6%. BMI was calculated and 66% of patients had normal BMI, 24% had BMI of >24, only 10% had BMI of

<18%. In this study on bimanual examination, only 24% had mass in fornices, and 48% had tenderness in fornices, restricted mobility of uterus was seen in 20% and nodules in POD seen in 4% patients (Table 2)

Table-2: Bimanual Examination Findings

Findings	Cases	Percentage
Mass In Fornices	12	24%
Tenderness In Fornices	14	48%
Restricted Mobility Of Uterus	10	20%
Nodules In Pod	2	4%

In the ultrasonography the most common finding was ovarian cyst 36% patients, 18% had torsion ovarian cyst, 18% PCOD, 12% had To mass, 6% had

hydrosalpinx, 4% endometriotic cyst, 4% para ovarian cyst, 2% broad ligament fibroid (Table 3).

Table-3: Ultrasonography Findings

Findings	Abnormality	No. of Cases	Percentage
Uterus			
	Enlarged	1	2%
Ovary			
	Ovarian Cyst	18	36%
	Torsion Ovarian Cyst	9	18%
	PCOD	9	18%
	Endometriotic	2	4%
Tubes			
	To Mass	6	12%
	Hydrosalpinx	3	6%
Others			
	Broad Ligament Fibroid	1	2%
	Para Ovarian Cyst	2	4%

In this study on laparoscopy most common finding was ovarian cyst 24% torsion ovarian cyst seen in 18%, endometriotic cyst in 8%, gangrenous ovarian cyst in 4%, dermoid in 2%, tubo ovarian mass in 8%,

hydrosalpinx in 10%, fimbrial cyst in 4%, para ovarian cyst in 6%, broad ligament fibroid in 2%, endometriotic nodules found in 4%, adhesions in 20%, free fluid in POD found in 24% patients shown in table 5.

Table-4: Histopathology findings in the study

Histopathology	No. of Cases	Percentage
Functional	21	42%
Hydrosalpinx	5	10%
Endometriotic Cyst	5	10%
Paraovarian Cyst	4	8%
Fimbrial Cyst	3	6%
Dermoid	1	2%
Fibroid	1	2%
Mucinous Cystadenoma	1	2%

Table-5: Laparoscopy Findings

Findings	Abnormality	No. of Cases	Percentage & 95% CI
OVARY			
	Ovarian Cyst	12	24% CI±11.84
	Torsion Ovarian Cyst	9	18% CI±10.65
	Gangrenous Ovarian Cyst	2	4% CI±5.43
	PCOD	7	14% CI±9.62
	Endometriotic Cyst	4	8% CI±7.52
	Dermoid Cyst	1	2% CI±3.88
TUBES			
	To Mass	4	8% CI±7.52
	Hydrosalpinx	5	10% CI±8.32
	Fimbrial Cyst	2	4% CI±5.43
OTHER			
	Broad ligament Fibroid	1	2% CI±3.88
	Para Ovarian Cyst	3	6% CI±6.58
	Endometriotic Nodules	2	4% CI±5.43
	Adhesions	10	20% CI±11.09
POD			
	Free Fluid	12	24% CI±11.84

The most common histopathology finding was a functional cyst in 42%, hydrosalpinx in 10%, endometriotic cyst in 10%, para ovarian cyst 8%, fimbrial cyst in 6%, dermoid in 2%, fibroid in 2%, mucinous cystadenoma 2% patients.

In this study most commonly performed procedure was cystectomy 32%, followed by salpingo-oophorectomy 28%, salpingectomy 16%, ovarian drilling in 14% patients, converted to laparotomy 4%, fibroid removal in 2%, adhesiolysis in 4% patients. There were no major intraoperative complications in this study, only 4% patients had frozen pelvis for which laparoscopy has been converted to laparotomy. Only 2% had hemorrhaged. There were no cases of bowel injury or ureter injury. There were no major postoperative complications in this study, only 8% of patients had a low-grade fever and 4% had vomiting which was treated conservatively. No cases of bowel obstruction or port site infection seen.

DISCUSSION

Adnexal masses are a common finding among both premenopausal and postmenopausal women; nearly 10% of women at some point in their lives will undergo surgical evaluation for an adnexal mass or a suspected ovarian neoplasm [5, 6]. It is estimated that 60,000 surgical excisions in the United States per year are due to adnexal masses [5]. The majority of adnexal masses prevalent in the population, however, are benign, with only a small percentage of patients harboring an ovarian malignancy. Whereas one of the main goals of the initial diagnostic evaluation for the adnexal mass is to exclude malignancy, a closely related goal is to differentiate the adnexal masses that require active surgical intervention from those more appropriately managed medically or observed. Ten percent of suspected ovarian masses will ultimately be

found to be of non-ovarian in origin [6]. Many ovarian masses in the premenopausal woman can be managed conservatively. Functional or simple ovarian cysts (thin-walled cysts without internal structures) which are less than 50 mm maximum diameter usually resolve over 2–3 menstrual cycles without the need for intervention. If surgery is indicated, a laparoscopic approach is generally considered to be the gold standard for the management of benign ovarian masses [8-11]. Laparoscopic management is also cost-effective because of the associated earlier discharge from the hospital [12, 13]. Mini-laparotomy may be considered for occasional very large cysts of benign appearance. On rare occasions, the laparoscopic approach may be specifically contraindicated in an individual patient. Risk factors for ovarian cancer include age older than 60 years; early menarche; late menopause; nulliparity; infertility; personal history of breast or colon cancer; and family history of breast, colon, or ovarian cancer. In this study the majority of patients reported to the Hospital with pain abdomen 36%, irregular cycles 12%, infertility 12%, dysmenorrhoea 8% and dyspareunia 8%, nonspecific symptoms 24%. These findings similar to the study of clinicopathological correlation of adnexal masses in tertiary care center done by Badkur P *et al.* [14] and Olson *et al.* [15] study shows same findings.

The laparoscopic management of adnexal masses continues to evolve due to increased surgical expertise and technical progress. One of the major benefits of approaching all adnexal masses through laparoscopy is that many, if not most; patients will ultimately have benign pathology and can be spared exploratory laparotomy. It is possible to treat by laparoscopy select patients with adnexal masses who are at low risk for cancer. In spite laparoscopy being considered as standard care for the management of

adnexal masses it is imperative that the intent of gynecologic cancer surgery is not sacrificed for the benefits of laparoscopy. Laparoscopic management of adnexal masses is clearly dependent upon immediate access to accurate pathology evaluation. Dottino *et al.* [16] in their study of Management of Adnexal Masses stated that they do not recommend a laparoscopic approach to adnexal pathology if immediate and accurate pathologic diagnosis is unavailable. Delays of more than 4 weeks from the time of initial diagnoses to the complete surgical staging for incidentally discovered ovarian cancer have been reported and adverse impact has been described [17]. A recent study by Kindermann *et al.* [18] argued that even delays of 8 days from diagnosis to treatment can allow for disease progression. In this study, laparoscopy detected 4 endometriotic cysts whereas USG detected only 2 cases of endometriotic cysts and laparoscopy diagnosed 5 cases of hydrosalpinx whereas USG diagnosed only 3 cases of hydrosalpinx. Laparoscopy diagnosed 2 cases of fimbrial cysts whereas USG could not detect any case of the fimbrial cyst. Laparoscopy diagnosed 3 cases of para ovarian cyst whereas USG missed one case and laparoscopy diagnosed 2 cases of endometriotic nodules whereas USG could not detect them. The sensitivity of USG for diagnosis of hydrosalpinx is 60% and for diagnosis of endometriotic cyst 50% and for diagnosis of para ovarian cyst is 66%. This proves laparoscopy is a better tool in the diagnosis of these adnexal masses than USG and clinical examination. In this study most commonly performed procedure was cystectomy in 32% cases followed by salpingo-oophorectomy in 28% cases and salpingectomy in 16% of cases.

Most commonly performed procedure in this study was cystectomy with tissue sparing surgery which is similar to study done by Duggal *et al.* [19] and B and Deligeoroglou *et al.* [20] Salpingo-oophorectomy was performed in 28% cases where conservation of ovary and tube is not possible. Salpingectomy is done in 16% cases where hydrosalpinx and tubal pathology found. In 7 cases of PCOD cases, ovarian drilling was done by using monopolar cautery. In 2 cases laparoscopic adhesiolysis was done by using bipolar cautery in cases of endometriosis and PID. Only 2 cases got converted to laparotomy because of dense adhesions and frozen pelvis where the procedure could not be completed laparoscopically. Colpotomy was done when specimen could not be retrieved by grasper or when there is technical difficulty in removing or when there is large mass >10 cm. These patients also did not develop any complications postoperatively like an infection. This suggests that colpotomy is a safe procedure. This is similar to the study done by Clarke *et al.* in 2015 [21]. Clark suggested that transvaginal specimen retrieval through a posterior colpotomy incision is safe, effective, and technically feasible for the gynecologic laparoscopic surgeon and should be considered as an alternative to extending umbilical or

accessory abdominal ports [21]. Only in one case hemorrhage was seen No intraoperative bowel injury and urinary tract injury seen. No major postoperative complications were seen in this study only minor postoperative complications like the fever in 4 cases and vomiting in 2 cases which were managed conservatively. No cases had a bowel obstruction and port site infection, emphysema postoperatively. This is comparable with the study done by Dottino *et al.* [22] Among 4 cases of fever 2 cases were seen in the patients with laparotomy were managed conservatively.

CONCLUSION

Evaluation of adnexal masses in the reproductive age group is of prime importance and mandatory for appropriate management. Laparoscopy has shown to be the definitive tool for evaluation in surgical management of these masses. Ultrasonography is an adjunct tool which may aid in the diagnosis. Majority of adnexal masses in the reproductive age group are benign in nature.

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