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LAPAROSCOPIC MANAGEMENT OF ADNEXAL MASSES -A DESCRIPTIVE STUDY FROM A TERTIARY REFERRAL CENTER

OBGY & Laparoscopic Surgery

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ABSTRACT

Adnexal masses are fairly common among women with a prevalence of 0.17% to 5.9% in asymptomatic women and 7.1% to 12% in symptomatic women of all age groups but very common among reproductive age. These masses can be of gynecological or non-gynaecological origin & can be benign, malignant or borderline masses. Laparoscopic management of adnexal masses is considered to be standard of care in management of benign adnexal masses. The present study aims to evaluate the effectiveness & safety of laparoscopic management of adnexal masses thought to be benign preoperatively along & also assess their clinical outcomes.

KEYWORDS

IOTA(International Ovarian Tumor analysis), MRI(Magnetic resonance Imaging), TVS(Trans vaginal scan), VAS(Visual Analogue Scale), P/V(Per vaginum)

Prevalance:

Adnexal masses are common among women with a prevalence of 0.17% to 5.9% in asymptomatic women and 7.1% to 12% in symptomatic women of all age groups but very common among reproductive age.2

Ovarian cancer is the third most common gynecologic cancer 8 and seventh most common cancer among women in the world .8 The lifetime risk of ovarian cancer is about 2.7%.

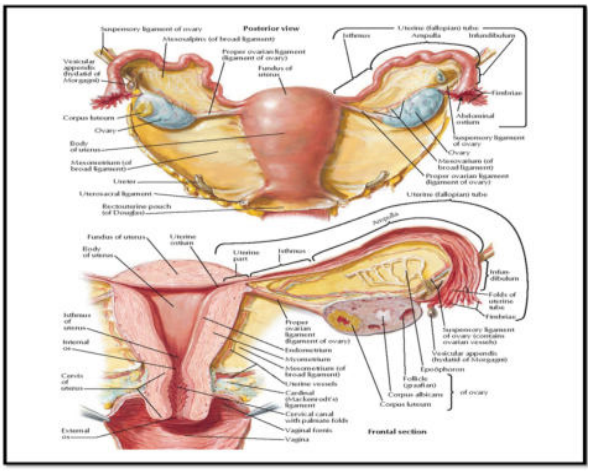
Types Of Adnexal Masses:

Adnexal masses are of various types and are complex. Adnexal mass can be of gynecological or non-gynecological origin. They can be benign, borderline or malignant masses.

Table 1 : Differential diagnosis of an Adnexal mass

Gynecological: Ovarian	Gynecological: Tubal	Gynecological: Extra ovarian and extra tubal	Nongynecological
Benign			
• Functional cyst • Corpus luteal cyst • Luteoma of pregnancy • Theca lutein cyst • Polycystic ovaries • Endometrioma • Cystadenoma • Benign ovarian germ cell tumor (e.g.: mature teratoma) • Benign sex-cord stromal tumor	• Ectopic pregnancy • Hydro-salphinx	• Paraovarian cyst • Paratubal cyst • Uterine leiomyoma (pedunculated or cervical) • Tubo-ovarian abscess	• Constipation • Appendicular abscess • Diverticular abscess • Pelvic abscess • Bladder diverticulum • Ureteral diverticulum • Pelvic kidney • Peritoneal cyst • Nerve sheath tumor
Malignant or Borderline			
• Epithelial carcinoma • Epithelial borderline neoplasm • Malignant ovarian germ cell tumor • Malignant sex cord-stromal tumor	• Epithelial carcinoma • Serous tubal intraepithelial neoplasia	• Metastatic endometrial carcinoma	• Appendiceal neoplasm • Bowel neoplasm • Metastasis (e.g., breast, colon, lymphoma) • Retroperitoneal sarcoma

Anatomy Of The Adnexa:



Assessment of Adnexal Mass:

Tumor Markers:

A tumor marker is a biomarker specific for malignancy.

The tumor markers which have role in ovarian malignancies are:
Ca125 & CA-125 II.

CA125 currently the most widely used tumor marker for ovarian epithelial tumors. MUC16 gene codes for CA125 which is a large transmembrane glycoprotein and contains domains A & B. Extracellular domain contains sequences to which OC125 & M11 monoclonal antibodies bind. The original CA125 binds to OC125 while the newer CA125 II binds to OC125 & M11, thereby is more specific.

A number of factors are known to influence serum CA125 levels in healthy women like age(premenopausal women have higher levels of CA125 than postmenopausal women),menstrual cycle(Some women have fluctuating serum CA125 levels throughout the menstrual cycle),pregnancy(CA125 increase during pregnancy), race (significantly higher CA125 are found in healthy Caucasian women compared to Asian or African women).These factors should be taken into account when interpreting CA125 test results.

It is also used for following up after surgery, when level increases it indicates residual tumour.CA125 increased in only 50% of stage1 ovarian tumor and 90% in stage 2 ovarian tumour.53

Specificity of CA125 can be combined with transvaginal ultrasonography.

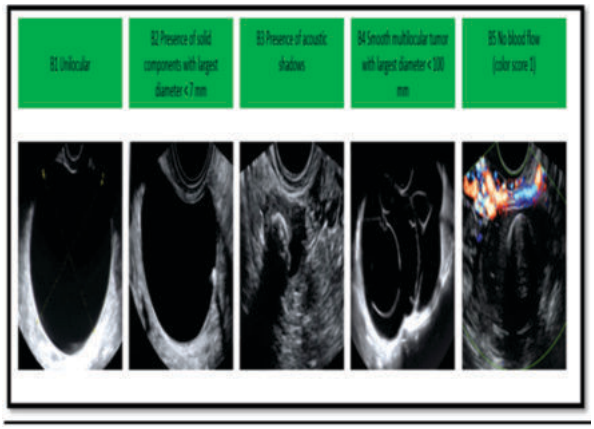
USG:
An ultrasound (USG) is the first investigation of choice in suspected adnexal masses. ` Transvaginal ultrasound (TVUS) is considered as a highly accurate method in evaluation of ovarian cysts and adnexal masses.

Most of the studies recommend color Doppler in combination with grayscale

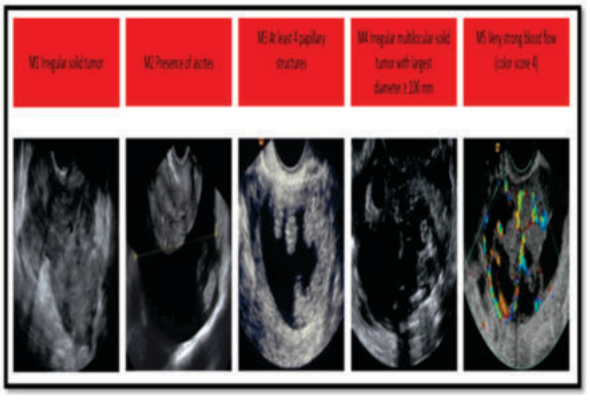
USG as the first diagnostic modality of choice for all adnexal masses including ovarian masses.

The USG features associated with malignancy include:
1) a solid component or nodularity, particularly with color or power Doppler demonstration of flow in the solid component.
2) Thick separations >2-3mm

Risk Assessment for Malignancy:
International Ovarian Tumor Analysis (IOTA)
Benign - Only B-features apply
Malignant - Only M-features apply
Inconclusive - no features apply, or both B- and M-features apply.



Simple Rules-preoperative classification system for Ovarian tumors



Simple Rules-preoperative classification system for Ovarian tumors

Risk of Malignancy Index (RMI):
RMI I combines three pre-surgical features: serum CA125 (CA125), menopausal status (M) and ultrasound score (U). The RMI is a product of the ultrasound scan score, the menopausal status and the serum CA125 level (IU/ml).
RMI = U x M x CA125

- The ultrasound result is scored 1 point for each of the following characteristics: multilocular cysts, solid areas, metastases, ascites and bilateral lesions. U = 0 (for an ultrasound score of 0), U = 1 (for an ultrasound score of 1), U = 3 (for an ultrasound score of 2–5).
- The menopausal status is scored as 1 = pre-menopausal and 3 = post-menopausal
- The classification of 'post-menopausal' is a woman who has had no period for more than 1 year or a woman over 50 who has had a hysterectomy.
- Serum CA125 is measured in IU/ml and can vary between 0 and hundreds or even thousands of units.

Post Operative Complications:
Clavien Dindo Classification:

Grade	Clinical Description
Grade I	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic and radiological interventions Allowed therapeutic regimens are: drugs as antiemetics, antipyretics, analgesics, diuretics and electrolytes and physiotherapy. This grade also includes wound infections opened at the bedside.
Grade II	Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Blood transfusions and total parenteral nutrition are also included.
Grade III	Requiring surgical, endoscopic or radiological intervention
- IIIa	Intervention not under general anaesthesia
- IIIb	Intervention under general anaesthesia
Grade IV	Life-threatening complication (including CNS complications)* requiring IC/ICU-management
- IVa	single organ dysfunction (including dialysis)
- IVb	Multi organ dysfunction
Grade V	Deaths of a patient

*brain haemorrhage, ischemic stroke, subarrachnoidal bleeding,but excluding transient ischemic attacks (TIA);IC: Intermediate care; ICU: Intensive care unit.

AIM & OBJECTIVES:
To Study the Indications, intraoperative findings, and different interventions contemplated to deal with adnexal masses.

MATERIALS AND METHODS
Source of data:
This is a Descriptive study, conducted on the patients admitted to department of Obstetrics and Gynecology, RRMCH, Bangalore. All the patients were followed up with histopathology report .

Methods of collection of data:
Study design: Descriptive Study.
Study period: 1 Year (Nov 2018 to Oct 2019)
Place of study: Inpatients in Dept of Obstetrics & Gynecology at Rajarajeswari Medical College and Hospital, Bangalore.
Sample size: 100 patients

Inclusion criteria:
a. Benign mass (Ultrasound Finding)
b. Normal Preoperative estimation of Tumor marker especially CA 125 (normal range 0-35 U/mL)
c. Unruptured ectopic pregnancy

Exclusion criteria:
a. Ultrasonography features suspicious of Malignancy i.e Solid masses, thick septa, fixed mass etc.
b. Exceptionally high CA-125 values (more than 200U/mL)
c. Known contraindications of laparoscopy
d. Mass arising from an abdominal organ on laparoscopy (non-gynecologic causes)

Methodology:
In women presenting to Department of Obstetrics & Gynecology, Rajarajeshwari Medical College & Hospital with a pre-operative diagnosis of benign adnexal mass, a written informed consent was taken.

All patients were counselled that in the case of an unexpected intraoperative diagnosis of malignancy, a classical vertical incision could be taken. The study was stopped when 100 consecutive patients were enrolled.

A detailed history including age, chief complaints with duration, menstrual history including menopausal status if any, concomitant systemic diseases, any past medical or surgical history was obtained.

Clinical examination which included, general physical examination of patient's height, weight, BMI, breasts, thyroid & spine was noted. Followed by recording of pulse rate, blood pressure, temperature. This was followed by per abdominal, per speculum & per vaginal examinations. Systemic examination of cardiovascular system, respiratory system & central nervous system was recorded.

Blood investigations included, Complete hemogram, Blood grouping & Rh typing, Urine Routine, Random Blood Sugar (RBS), Renal Function Test (RFT) & Serum Electrolytes, Liver Function Tests (LFT), HIV, HBsAg, VDRL & Tumor markers – CA 125 .

Primary imaging modality was via Ultrasound with or without Doppler. RMI Index was calculated to rule out malignancy in suspicious cases. Other imaging viz. CT/MRI was also employed when there was a suspicion of malignancy.

Laparoscopic surgery was performed after pre-anesthetic assessment. Intra operative findings were noted. The decision for oophorectomy or ovarian cystectomy was based on the age of the patient and on the surgical findings. Frozen section was taken in case of suspicion of malignancy. Specimens were removed through the trans-umbilical port and was sent for histopathology.

Operative findings – which includes blood loss, duration of surgery, any complications including conversion to laparotomy was noted.

Post op complications was categorized as per Clavien-Dindo Classification.

Patients were discharged when they were fully mobile, passing urine satisfactorily, and not requiring narcotic analgesia. The results of the histopathology was made available within 2 weeks from surgery and would determine if any further treatment was needed.

RESULTS:

A total of 100 subjects were included in the final analysis.

Age at Presentation:

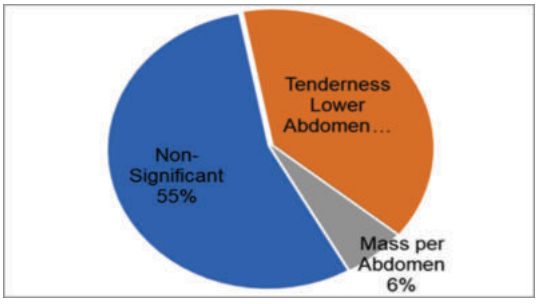
In the present study, the mean age of presentation was 29.01 ± 8.6 years. The youngest age at presentation was 12 years and the oldest age at presentation was 63 years (95% CI 27.30 to 30.72) (Table 3)

Table3: Descriptive analysis of age (in years) in study population (N=100)

Parameter	Mean +/- SD	Median	Minimum	Maximum	95% C.I	
					Lower	Upper
Age in Years	29.01+/-8.6	27	12	63	27.30	30.72

Per-Abdomen Findings:

Descriptive analysis of per abdominal examination in the study population (N=100)



Pie chart of Per Abdominal Examination in the study population (N=100)

CA-125

The marker CA-125 was 21.05 ± 6.84 in the study population, minimum was 10 and maximum was 31 in the study population (95% CI 17.93 to 24.16).

Descriptive analysis of tumor marker CA 125 in study population (N=100)

Parameter	Mean ± SD	Median	Minimum	Max.	95% C.I	
					Lower	Upper
Tumor Marker CA-125 (N=21)	21.05 ± 6.84	20.00	10.00	31.00	17.93	24.16

Intra operative findings:

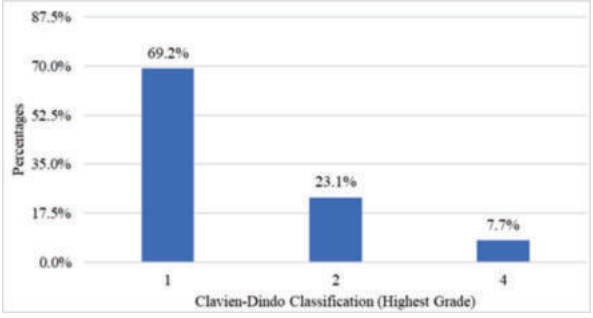
Among the study population, 15 (15%) had endometriotic cyst, 23 (23%) had simple ovarian cyst, 6 (6%) had hematosalphinx, 11 (11%) had dermoid cyst, 4 (4%) had serous cyst, 4 (4%) had mucinous cyst, 6 (6%) had hydrosalphinx, 3 (3%) had pyosalphinx, 20 (20%) had un ruptured ectopic pregnancy and 7 (7%) had para ovarian cyst.

Descriptive analysis of per operative findings:

Per operative findings	Frequency	Percentages
Simple Ovarian Cyst	23	23.0%
Unruptured Ectopic Pregnancy	20	20.0%
Endometriotic cyst	15	15.0%
Dermoid cyst	11	11.0%
Para Ovarian Cyst	7	7.0%
Ovarian torsion	6	6.0%
Hydrosalphinx	6	6.0%
Serous cyst	4	4.0%
Mucinous cyst	4	4.0%
Pyosalphinx	3	3.0%
Hematosalphinx	1	1.0%

Clavien-Dindo Grading:

Among the study population, Grade I complication was seen in 9 patients (69.2%). Grade II complication was seen in 3 patients and 1 patient (7.7%) who had conversion from laparoscopy to open surgery in view of frozen pelvis, required ICU stay and accounted for Grade IVa.



Bar chart of Clavien-Dindo Classification (Highest Grade) in the study population (N=100)

Results of Ultrasound Abdomen:

Descriptive analysis of USG report in the study population (N=100)

Ultrasound Abdomen Report	Frequency	Percentages
Simple ovarian cyst	28	28.0%
Adnexal mass	22	22.0%
Unruptured ectopic	17	17.0%
Endometriotic cyst	13	13.0%
Dermoid cyst	9	9.0%

Ovarian torsion	5	5.0%
Hydrosalphinx	4	4.0%
Pyosalphinx	1	1.0%
Paraovarian cyst	1	1.0%

Histopathology Results:
Descriptive analysis of histopathology report in the study population (N=100)

Histopathology Report	Frequency	Percentages
Simple Ovarian Cyst	23	23.0%
Unruptured Ectopic Pregnancy	20	20.0%
Endometriotic cyst	15	15.0%
Dermoid cyst	11	11.0%
Para Ovarian Cyst	7	7.0%
Ovarian torsion	6	6.0%
Hydrosalphinx	6	6.0%
Serous cyst	4	4.0%
Mucinous cyst	4	4.0%
Pyosalphinx	3	3.0%
Hematosalphimx	1	1.0%

DISCUSSION

A mass arising from ovary, fallopian tube or their surrounding tissues is called an adnexal mass and is of common occurrence in women. Timely diagnosis and intervention helps in preserving ovarian function.74 The management of these masses will depend on age of presentation, severity of symptoms, size, characteristics of mass, levels of CA 125 and risk of malignancy.75 Most of the symptomatic patients require a surgical intervention to ameliorate the symptoms and it is essential to rule out malignancy in these lesions. Various parameters like USG features, age of the patients and level of CA125 can be taken into consideration to rule out malignancy.

Various studies have demonstrated advantages of laparoscopic surgery especially in benign adnexal masses. Laparoscopy provides advantages, like superior panoramic view, less postoperative pain, shorter stay in the hospital, lower readmission rates, and lower overall cost. Laparoscopy is now a preferred treatment option for benign adnexal masses.

The primary objective was to study indications, intraoperative findings and different interventions used to deal with adnexal masses. The study also intends to evaluate postoperative complications following laparoscopic surgery employing Clavien-Dindo classification.

CONCLUSION:

Ultrasound abdomen & pelvis with selective CA125 testing was effective in identifying benign adnexal masses pre-operatively & these findings were congruent with the intra operative findings and results of final histopathological examination.

The results of this study establish that laparoscopy offer the advantage of reduced postoperative morbidity, shorter length of stay in hospital & early return to normal routine activity.

The results of this study aid in strengthening the role of laparoscopy as an effective management technique for patients with benign adnexal masses.

Summary:
An adnexal mass, arising from ovary, fallopian tube, or surrounding connective tissue, is a common gynaecologic problem found in women of all ages - foetuses to the elderly - and has a wide variety of aetiologies. Such adnexal masses may be symptomatic or discovered incidentally on pelvic examination or by imaging.

Adnexal masses, such as an ectopic pregnancy, adnexal torsion, a ruptured ovarian cyst with haemorrhage, or a tubo-ovarian abscess require immediate surgical attention. The etiopathology of mass is determined with pelvic imaging, use of biomarkers, and/or surgical exploration and histopathologic evaluation. The differential diagnosis of an adnexal mass varies according to age and menopausal status and a serious concern is the possibility of malignancy.

In the present study on laparoscopic management of adnexal masses, out of total hundred cases, majority of the patients were premenopausal. Ultrasound abdomen with selective CA125 testing was effective in identifying benign adnexal masses pre-operatively.

This study concludes that laparoscopic management is feasible in almost all benign adnexal masses. As the majority of study subjects were nulliparous, laparoscopy was effective in management of these adnexal masses with an intent to preserve ovarian function. The results of this study establish that laparoscopy offer the advantage of lower blood loss, reduced postoperative morbidity, lower pain scores, early ambulation, shorter length of stay in hospital and helped patients to return back to their normal routine within a short period of time.

The USG abdomen findings corelated with intraoperative findings and both of these were congruent with the results of final histopathological examination.

Adoption of Clavien-Dindo grading was effective in sub-stratifying all the post-operative complications into twelve minor (Grade 1 & 2) complications & one major (Grade 4a) complication.

The results of this study aid in strengthening the role of laparoscopy as an effective management technique for patients with benign adnexal masses and adopting a pot-operative morbidity score such as Clavien-Dindo would help in sub-stratifying post-op complications.

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