

A Case Series on Adnexal Masses in Women from Reproductive to Postmenopausal Age Group in One Year at a Tertiary Care HospitalVerma Kanupriya¹, Narula Aarti², Kaur Satinder Pal³, Gupta Anju⁴, Kaur Parneet⁵, Gupta Saryu⁶¹Junior Resident, Department of Obstetrics and Gynaecology, Government Medical College Patiala²Assistant Professor, Department of Obstetrics and Gynaecology, Government Medical College Patiala³Professor, Department of Obstetrics and Gynaecology, Government Medical College Patiala⁴Associate Professor, Department of Obstetrics and Gynaecology, Government Medical College Patiala⁵Professor and Head, Department of Obstetrics and Gynaecology, Government Medical College Patiala⁶Professor, Department of Radiology, Government Medical College Patiala

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Abstract:

Objectives: Adnexal masses (i.e. masses of the ovary and/or fallopian tube or surrounding tissues) are commonly encountered by gynaecologists and often present both diagnostic and management challenges. This is partly due to the fact that the most of the adnexal masses that are identified represent benign entities that do not necessarily require active management, yet a small subset will represent malignancy that requires both timely and appropriate surgical intervention for optimal outcome. The majority of adnexal masses are unintentionally discovered during physical examinations or pelvic imaging procedures. Less commonly, a mass can become symptomatic and thus the management decisions are influenced by the age, parity, family history and vitals of the patient. This study highlights the varied nature of the adnexal mass, analyse the clinical features, imaging, management and histopathology in the patients from reproductive to post-menopausal age group in 1 year.

Methods: This is a case series on adnexal masses reported from the Department of Obstetrics and Gynaecology, Government Medical College and Rajindra Hospital, Patiala, Punjab, India from 1 May, 2022 to 31 May, 2023, who underwent medical and/or surgical treatment and followed by the histopathological examination of specimens.

Results: 16 patients with adnexal masses were included in the study. 7 patients had suspicion of malignancy in radiological investigations but only 4 cases reported to be malignant on histopathology that were started on chemotherapy. Tubercular pathologies were dealt with ATT.

Conclusion: Majority of the adnexal masses present with pain abdomen and turn out to be benign entities. Radiological investigations may suggest malignancy in some but histopathology is the gold standard investigation.

Keywords: Adnexal masses, histopathology, benign, malignant, tumour markers.

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Introduction

Adnexal masses are considered one of the important causes of morbidity and mortality. The most commonly encountered adnexal masses are benign and arise from the ovary.

Benign adnexal masses are more common in younger women. However, patients with malignancy are older and mostly postmenopausal.

Determining the extent and histopathology of the disease is important for appropriate treatment. It's critical to characterize ovarian tumors and discern between benign and malignant pathology in order to reduce unwarranted concern and make judgments about the best course of action. The

diagnostic dilemma exists because of their location, clinical presentation, and difficulty in differentiation on imaging alone.

Therefore, early understanding of the type of ovarian masses is crucial for the patient as well as for the planning, budgeting, and general administration of therapeutic services [1]. The decision of type of surgery and/or need of chemotherapy depends upon case to case. The histopathological confirmation is considered as gold standard.

Objective: To analyse the clinical features, imaging, management and histopathology of the

various abdomino-pelvic adnexal masses in 16 patients from reproductive and post-menopausal age group in a year.

Material and Methods

This is a case series reported from the Department of Obstetrics and Gynaecology, Government Medical College and Rajindra Hospital, Patiala, Punjab, India from 1 May, 2022 to 31 May, 2023. 16 cases have been reported from out-patient department (OPD), operation theatre registers and patient's indoor medical records.

The study includes the patients with large abdomino-pelvic masses who presented with a variety of symptoms. Tumour markers were done and depending upon their nature and sizes, necessary radiological investigations were done. The Risk Malignancy Index (RMI) was calculated in each case. They subsequently underwent medical

and/or surgical treatment. The cases were operated upon in the Department of Obstetrics and Gynaecology and specimens sent to Department of Pathology at Rajindra Hospital, Patiala for Histopathological examination.

The patients with operable status underwent unilateral or bilateral cystectomy or total abdominal hysterectomy with unilateral or bilateral oophorectomy. In case of neoplastic masses, standard regimen of chemotherapy was started. In case of tubercular pathologies, antitubercular therapy (ATT) was started.

Observations and Results:

Over the 1-year study period, there were total 16 cases of adnexal masses in our study. The observations and results of the study are illustrated in tabulated form.

Table 1: distribution according to age group

Age group	Benign	Malignant	Tubercular	Total no. of patients	Percentage
Reproductive	9	1	1	11	68.75%
Perimenopausal	1	0	0	01	6.25%
Menopausal	1	3	0	04	25%

The majority of women i.e. 68.75% were within the reproductive age group. 25% women were inmenopausal age group and 6.25% were in perimenopausal age group. The mean age of presentation of symptoms was 38 years. The average number of years after menopause, at which the adnexal mass was diagnosed, is approximately 8 years. The mean age ofdeveloping malignancy in post-menopausal women in our study is 58 years.

Table 2: Distribution according to gravida & parity

Parity	Benign	Malignant	Tubercular	Total	Percentage
Nulliparous	1	0	0	1	6.25%
Primiparous	1	0	0	1	6.25%
Multiparous	9	4	1	14	87.50%

A significant proportion i.e. 87.50% was multiparous, while 12.50% cases comprise of nulliparous and primiparous women with contribution of 6.25% individually.

Table 3: Distribution according to presenting symptoms

Presenting symptoms	No. of patients	Percentage
Abdominal pain	12	75%
Heavy menstrual bleeding	3	18.75%
Abdominal distension	4	25%
Postmenopausal bleeding	1	6.25%
Constitutional	8	50%

The commonest presentation was abdominal pain in 75% cases followed by abdominal distension in25%, heavy menstrual bleeding in 18.75%, and postmenopausal bleeding in 6.25% cases. Constitutional symptoms were present in 50% cases. Adnexal masses can present as acute abdomen requiring emergency exploratory laparotomy. Dermoid cysts are mostly symptom free but when undergo torsion, can lead to acute abdomen.

Table 4: Distribution according to duration of symptoms

Duration of symptoms	Benign	Malignant	Tubercular	Total	Percentage
<1 month	3	2	0	5	31.25%
1-6 months	5	2	1	8	50%
>6 months	3	0	0	3	18.75%

50% women developed symptoms in 1-6 months duration whereas 31.25% developed symptoms in less than 1 month and 18.75% developed in more than 6 months.

Table 5: illustration of CA-125 levels among cases in our study

CA-125 levels	No. of cases	Percentage
Normal range (0-35 U/mL)	5	38.46%
Raised CA-125 levels	8	61.53%

CA-125 was done in 13 cases. CA-125 levels were found to be more than normal levels in 61.53% of cases which co-related with the malignancy potential of the disease.

Table 6: Illustration of investigations (both radiological and histopathological) in our study

Investigations	Non-Malignant cases	Malignant cases	Percentage (benign)	Percentage (malignant)
Radiological findings	9	7	56.25%	43.75%
Histopathological findings	12	4	75%	25%

The radiological findings suggestive of malignancy as recorded in RMI score which includes multiloculated cyst, solid component, bilaterality, ascites and metastasis. The ultrasound result is scored 1 point for each of the above characteristics. In our study, the radiological findings in 7 cases were suggestive of malignancy. However, Only 4 cases were proven malignant after histopathological reporting. This signifies that histopathology is the gold standard investigation.

Table 7: Distribution according to histopathological findings

Histopathology/Cytology report	No. of cases	Percentage
Ovarian serous cystadenoma	6	37.50%
Mature cystic teratoma	4	25%
Ovarian mucinous cystadenoma	1	6.25%
Ovarian serous adenocarcinoma	1	6.25%
Leiomyosarcoma	1	6.25%
Leiomyoma	1	6.25%
Peritoneal mucinous carcinomatosis with adnexal deposits	1	6.25%
Tubercular peritonitis with bilateral adnexal mass? Adrenal tuberculosis (with?? Disseminated TB)	1	6.25%
Total	16	100%

The most common histopathological finding in our study is ovarian serous cystadenoma, constituting up to 37.50% (6/16 cases) followed by mature cystic teratoma being 25% (4/16 cases) followed by ovarian mucinous cystadenoma, ovarian serous adenocarcinoma, leiomyosarcoma, Broad ligament fibroid, Dermoid torsion, Peritoneal mucinous carcinomatosis with adnexal deposits and tubercular peritonitis with bilateral adnexal mass each constituting up to 6.25%.

Table 8: Distribution according to mode of treatment

Mode of treatment	No. of cases	Percentage
Only Surgical	11	68.75%
Surgery followed by Chemotherapy	3	18.75%
Only chemotherapy	1	6.25%
Anti-tubercular therapy	1	6.25%

Surgery was the mainstay in the treatment. However, 18.75% cases required follow up with chemotherapy. 6.25% cases (1/16 cases) directly started on chemotherapy and Anti-tubercular therapy started in rest of the 6.25% (1/16 cases) depending upon the FNAC report.

Table 9: Illustration of morbidity and mortality among cases in our study

Alive	15	93.75%
Dead	1	6.25%

Only 1 case (6.25%) expired. The patient was diagnosed as bilateral ovarian mucinous adenocarcinoma on histopathological examination and was undergoing chemotherapy at the Department of Radiation Oncology, Rajindra Hospital, and Patiala.

Master Chart of The Case Series								
Name	Age, Parity & group: Age Reproductive/ Perimenopausal/ Menopausal	Adnexa involved	Tumour markers (units/ml)	Radiological investigations: USG/CT/MRI findings	RMI score	Size of mass(cm)	Histo- pathology/ cytology report	Management
Ms A	40, multiparous Reproductive	Right adnexa	CA-125=11.4	Complex solid-cystic mass? Neoplastic. Traces of free fluid in pelvis	11.4	18*13.3*8.34	Serous cystadenoma	Total abdominal hysterectomy with right salpingo-oophorectomy
Ms B	23, primiparous Reproductive	Left adnexa	CA125=14.40 CA19.9=14 S.LDH=231 CEA=2.1 AFP=2.33	Complex cystic, thick septae with mural nodules	14.4	20*10.7*19.1	Mature cystic teratoma	Laparotomy followed by left salpingo-oophorectomy
Ms C	32, Multiparous, Reproductive	Both adnexa	CA-125=9.8	Complex cystic masses with mural nodules? dermal plug	29.4	5.0*6.7*4.2(right) 3.6*2.8*2.5(left)	Bilateral Mature cystic teratoma	Laparotomy followed by bilateral cystectomy
Ms D	50, Multiparous, Perimenopausal	Left ovary	CA-125=20.4 CEA=1.8	Large abdomino-pelvic cystic mass, multiloculated, thick & thin septae ? neoplastic	61.2	18*27.5*31	Serous cystadenoma	Total Abdominal Hysterectomy with Bilateral Salpingo-oophorectomy
Ms E	44, Multiparous, Reproductive	Right adnexa	CA125=10.51 CA19.9=17.14 CEA=4.8 S.LDH=632	Large abdomino-pelvic cystic, pedunculated mass with few thin septae, moderate ascites	3.62	34.1*32.5*19.1	Serous cystadenoma	Total Abdominal Hysterectomy with bilateral salpingo-oophorectomy with right side broad ligament cyst enucleation.
Ms F	60, Multiparous, Menopausal at 46 years of age.	Right adnexa	CA-125=4.5	Complex cystic mass	13.5	10.8*8.3*10	Serous cystadenoma	Total abdominal hysterectomy with bilateral salpingo-oophorectomy
Ms G	38, Multiparous, Reproductive	Left adnexa	-	Large ill-defined pelvic mass in left adnexa likely broad ligament fibroid	-	11.4*8.77*6.4	Leiomyoma	Total abdominal hysterectomy with left salpingo-oophorectomy
Ms	45, Multiparous,	Right	CA-125=42.	Solid-cystic mass,	127.50	16*9.7*18	Leiomyosarcoma	Exploratory laparotomy

H	Reproductive	ovary and left adnexa	5	multiloculated with necrotic areas, diffuse omental thickening ? metastasis ? primary peritoneal malignancy ? lymphoma. left paraovarian cyst. Right hemorrhagic cyst. Intramural leiomyoma. Moderate ascites				with removal of mass followed by Chemotherapy
Mrs I	62, Multiparous, Menopausal at 43 years of age	Left adnexa	CA-125=51.8 CA19.9=109.9	Complex solid-cystic mass with ? areas of necrosis in left adnexa and solid mass in right adnexa	466.2	7.0*6.4*4.8 (left) & 2.5*1.4*2 (right)	Bilateral serous Adenocarcinoma	Total abdominal hysterectomy with bilateral salpingo-oophorectomy followed by Chemotherapy
Mrs J	34, Multiparous, Reproductive	Right adnexa	CA-125=2.4	Complex solid-cystic mass with mural nodules.	2.4	2.4*2.3*12.7	Mature cystic teratoma	Laparotomy followed by right salpingo-oophorectomy
Mrs K	65, Multiparous, Menopausal at 61 years of age.	Both ovaries	CA-125=140.60 CA19.9=	Bilateral complex SOL, gross ascites, rectosigmoidal wall thickening. omental & peritoneal nodular thickening? malignant ovarian mass with peritoneal carcinomatosis	1265.4	3.4*4.6*2.25 (right) 2.66*3.1*3.6 (left)	Mucinous adenocarcinoma	Exploratory laparotomy with total abdominal hysterectomy with bilateral salpingo-oophorectomy followed by Chemotherapy
Mrs L	20, Nulliparous, Reproductive	Left ovary	CA-125=14.6	Large abdominopelvic complex cystic mass with few thin septae.	14.6	14.2*14.2*6.5	Serous cystadenoma	Laparotomy followed by left salpingo-oophorectomy.
Mrs M	22, multigravida, Reproductive	Right adnexa	CA-125=116.50	Cystic, thin walled, unilocular round to oval mass in pelvis, likely origin from right ovary.	116.5	22*21*10	Serous cystadenoma	Exploratory laparotomy with right cystectomy with bilateral tubal ligation after first trimester MTP.
Mrs N	60, Multiparous,	both adnexa	-	Complex Cystic mass, thin septae & mural		4*3.4*3.7 (right) 13*8.7*8.2 (left)	Peritoneal mucinous	Chemotherapy

	Menopausal at 57 years of age			nodules? ovarian malignancy with peritoneal deposits with mild to moderate ascites		t)	carcinomatosis with ovarian deposits.	
Ms O	32, Multiparous, Reproductive	Both adnexa	CA-125=772 [Ascitic tap: LDH-1633, ADA-77.46 Protiens -5.14 DLC-lymphocytes (98%) Cytology-lymphocyte predominant. AFB-negative]	Large, ill defined, cystic, multiloculated mass in bilateral adnexa & pelvis with omental thickening & caking? neoplastic ? infective. liver, spleen and right adrenal gland involvement+ mild ascites+ abdominal lymphadenopathy +	2316	-	Tubercular peritonitis with? Adrenal tuberculosis (with??Disseminated TB)	ATT
Ms P	39, Multiparous, Reproductive	Both adnexa	-	Complex cystic, thick septae with mural nodules in both left and right cysts likely dermoid cysts. Right ovary appears bulky and shows whirlpool sign of right vascular pedicle.	-	10*9.5*8.7 (right) 4*3.5*3 (left)	Bilateral dermoid cysts with right dermoid torsion.	Laparotomy followed by bilateral cystectomy.

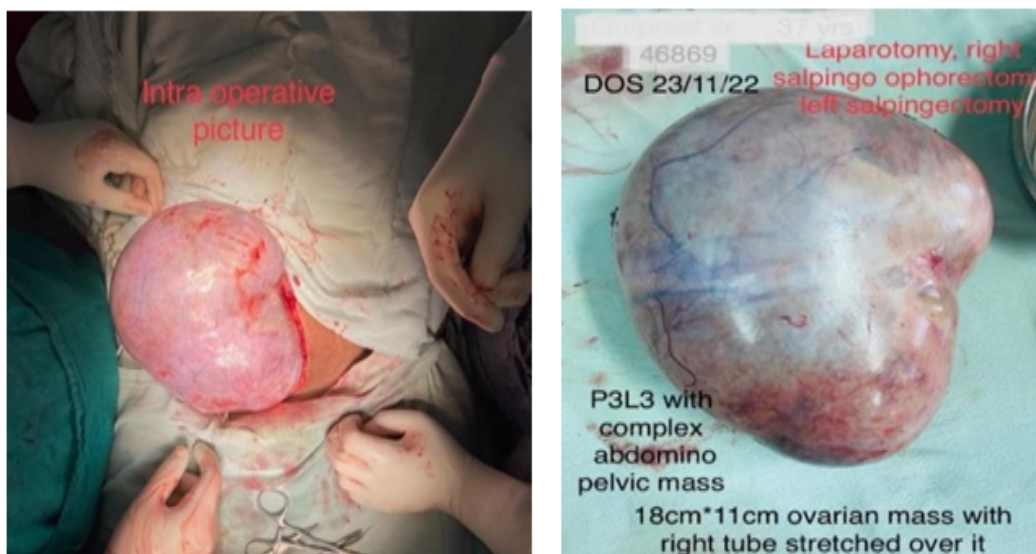


Figure 1: Photographs (intra-operative and gross specimen) showing: mature cystic teratoma

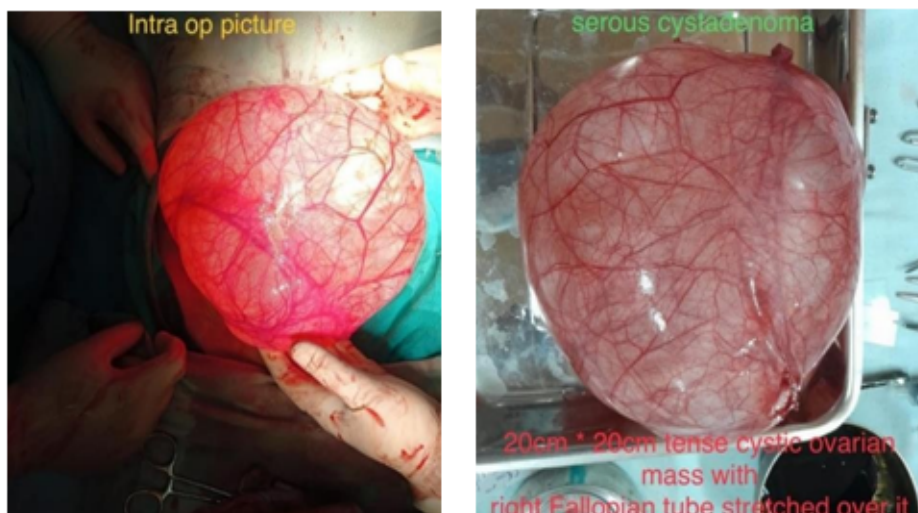


Figure 2: photographs (intra-operative and gross specimen) showing: Serous cystadenoma of ovary

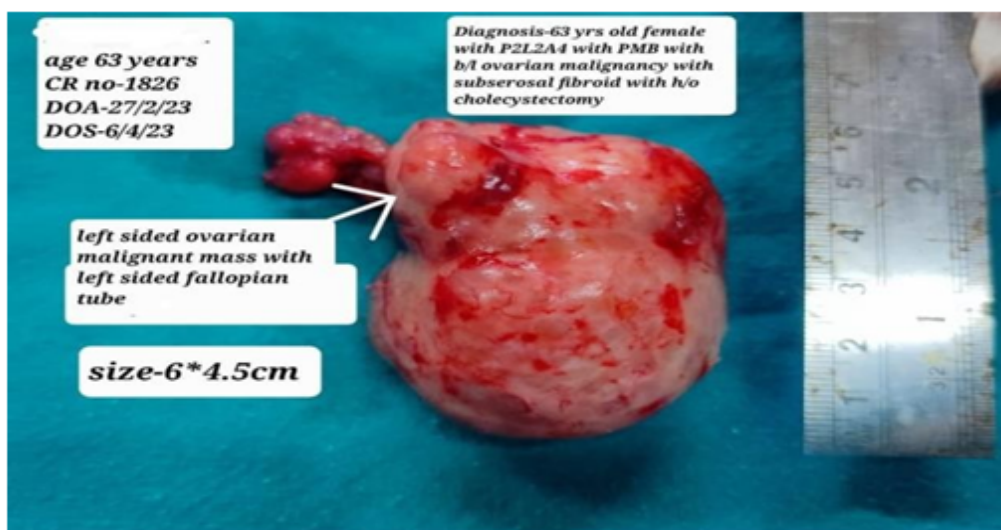


Figure 3: Gross picture of mass in left adnexa likely malignant



Figure 4: photographs (intra-operative and gross) showing dermoid cyst that underwent torsion



Figure 5: Cut section of dermoid cyst showing sebaceous material

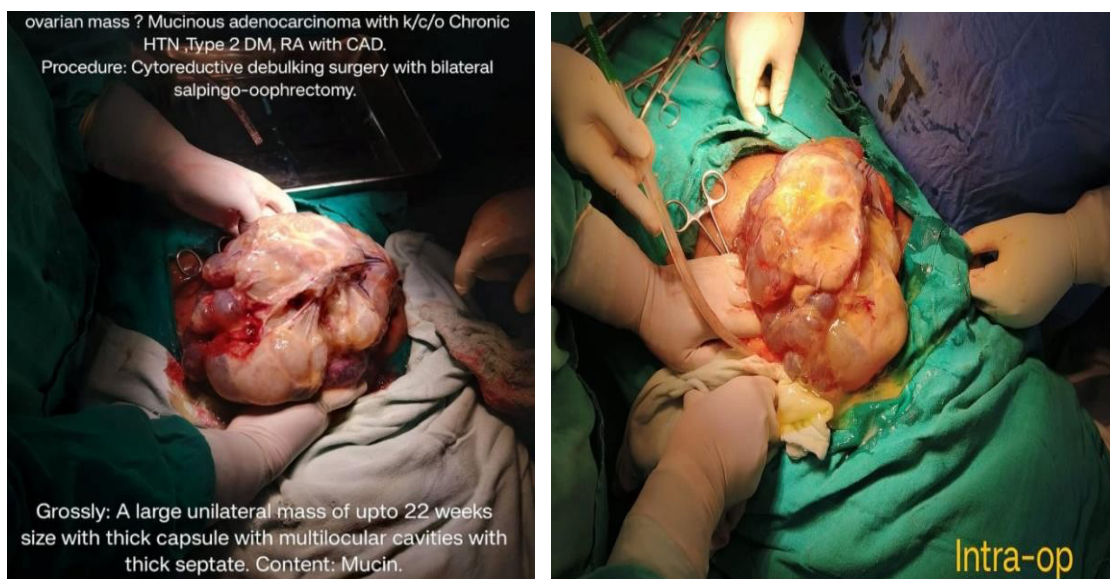


Figure 6: Intra-operative photographs of mucinous cystadenocarcinoma

Discussion

The ovaries and fallopian tubes are part of the group of structures known as the adnexa, which is located next to the uterus. Twenty percent of women will at some point in their lives acquire at least one pelvic mass, most commonly ovarian cysts or adnexal masses. Differential diagnosis of an adnexal mass is complex and can vary from functional cyst to life threatening ectopic pregnancies to ovarian malignancy [2]. Ovarian Cancer remains the leading cause of cancer among females and constitutes about 30% of all cancers of female genital tract [3]. Globally Ovarian malignancy is the sixth most common cancer (age standardized incidence rate 6.6/100,000) and the seventh leading cause of cancer deaths (Mortality rate 4.0/100,000) [4,5]. In India, the Ovarian cancer has emerged as the third common malignancy among females with an incidence varying between 5.4-8 per 1,00,000 population [6]. The incidence of ovarian tumours in post-menopausal women is commonly noted in the age group 60-80 years [7].

The mean age of diagnosis in our study is 58 years, which is similar to a study by Jacobs et al. [8], where mean age was 56 years. The management is determined by the characteristics of the lesion, the age of the patient, and the risk factors for malignancy. In women of reproductive age, most of the adnexal masses turn out to be ovarian cysts which are mostly functional and benign and do not require surgical intervention. However, ovarian cysts can lead to complications such as pelvic pain, cyst rupture, blood loss, and ovarian torsion that require prompt management [9].

In post-menopausal women with adnexal masses, both primary and secondary neoplasms of ovary must be considered along with leiomyoma and broad ligament fibroid. Ovarian malignancy carries the worst prognosis amongst all gynaecological malignancies and it becomes imperative to diagnose it as early as possible [10]. Since ovarian malignancies have very few and non-specific symptoms, they are mostly diagnosed at a very late stage leading to a very poor prognosis in most cases. The overall 5-year survival is less primarily due to the late stage of the diagnosis of the disease. Early detection of ovarian malignancy is of paramount importance as it would lead to better prognosis. Histopathology remains the gold standard for diagnosis of ovarian malignancy.

Ovarian torsion is defined as partial or complete rotation of the ovarian vascular pedicle causing obstruction to venous outflow and arterial inflow [11]. When fallopian tube also twists with the ovary it is known as adnexal torsion [12]. Although it is more common in the childbearing age range, postmenopausal women and premenarchal girls can also experience adnexal torsion [13]. Usually, a

cyst or tumor is connected to it; mature cystic teratomas are the most common type [11]. Just like in our study, the tumour that underwent torsion and landing up the patient in emergency was likely dermoid cyst in radiological investigations and the same was found on histopathological report.

In postmenopausal women, serous cystadenoma, mucinous cystadenoma, and sero-mucinous cystadenoma are the most often occurring benign ovarian tumors. In this case series, serous cystadenoma is found to be the most common, which complies well with the studies by Mondal et al. [14] and Rajavigneshwari N et al. [15] However, as per a study by Soumini G et al. [16], mucinous cystadenoma was the commonest benign ovarian tumour. 30% of all ovarian tumours are serous cystadenomas. A similar study was conducted by Sivarajan, S. et al [17] which stated that the mean age of presentation of symptoms was 54.6 years and the average number of years after menopause, at which the abdominal mass was diagnosed, was 7.8 years and serous cystadenocarcinoma was most frequently found in the study. These results are very much comparable to our study.

CA-125 is present in ovaries' embryonic development but disappears in the course of development and is then re-expressed in ovarian neoplasms. Since CA-125 is produced by tissues derived from coelomic epithelium, elevations may be seen in the peritoneal and pleural epithelial and ascitic fluids [18]. In the developing countries, the risk of malignancy index (RMI) which combines ultrasound features, serum CA-125 levels and the menopausal status of the patient is still used to characterize ovarian pathology [19].

A study by O'Connell et al 20 among 56 patients presenting with pelvic masses showed that CA-125 had a negative predictive value of 100%, suggesting that this test may be useful in identifying those patients with pelvic masses at a higher risk of malignancy. However, another study by Vasilev et al [21] suggested that elevated serum CA 125 level by itself does not distinguish benign from malignant pelvic masses, which coincides with our study results. CA-125 levels were checked for majority of the patients in our study and 8 out of the 13 patients had values higher than 35U/ml, suggestive of malignancy. Despite these values, only 4 cases were proven malignant at the end as per histopathological report. This reinforces the importance of histopathology of the masses and its role in deciding the lines of management.

There was another prospective observational study of 50 patients with suspected various adnexal masses, conducted by Bhagde, Anand Dipak, et al. [22] for a period of 1.5 years i.e. from November 2014 to May 2016. Ages of the patients ranged from 19-58 years with a mean age of 31.5 years. About

92% patients with adnexal mass presents with abdominal pain as a chief complaint. The most common adnexal masses on histopathological diagnosis were mucinous cyst adenoma (20%), benign and mature cystic teratoma (16% and 6%) and serous cyst adenoma (10%). This is in contrast to our study, as most common presenting age was 38 years and most common histopathological diagnosis was serous cystadenoma followed by mature cystic teratoma. About 75% patients in our study presented with abdominal pain.

Risk Malignancy Index (RMI) Score is calculated as a product of CA-125 value, Menopausal status (M) (pre-menopausal =1 and post-menopausal= 3) and the score (U). (score 0- if no features, score 1-if any one of the ultrasound features is present, score 3- if 2 or more ultrasound features are present). RMI has a sensitivity of 85% and specificity of 97% with a cut-off level of 200 [23-25]. Here, the RMI score was in the higher range (>200) in 3 cases which correlated with the histopathology report in the end.

Huge ovarian masses with size more than 10 cm definitely warrant laparotomy with frozen section. Based on frozen section report, further steps like omental biopsies and lymph node dissection are decided. In our study, we observed that in most of the patients CA-125 levels suggested benign nature of the adnexal masses, imaging studies portrayed the possibility of malignancy too. Consequently, patients were advised that a laparotomy and frozen section would be necessary due to the size of the tumors, as histology is the most reliable method of diagnosis and subsequent treatment.

A study by Bailey et al. [26] concluded that unilocular ovarian cysts <10 cm in diameter in asymptomatic postmenopausal women or women ≥ 50 years of age are associated with minimal risk for ovarian cancer. In contrast, the complex ovarian cysts with cyst wall abnormalities or cysts with solid components are associated with a significant risk for malignancy. Similarly, there was another study by Rulin et al. [27] in which 40 out of 63 tumours larger than 10cm size, were found to be malignant. However, a study by Sirishapalakodety et al. [28] showed that large ovarian tumours of size more than 10 cm need not always be malignant. Our study also showed that large ovarian tumours more than 10 cm in size should be thoroughly evaluated with keeping the possibility of benign nature of the mass in mind.

Conclusions:

Adnexal masses are usually asymptomatic but sometimes patients present with pain abdomen and/or progressively increasing abdominal lump. They pose both diagnostic and management dilemmas partly because of the fact that majority of adnexal masses represent benign entities, yet a small subset

will represent malignancy that require both timely and appropriate surgical intervention for optimal outcome. The diagnostic dilemma also exists because of their location, clinical presentation, and difficulty in differentiation on imaging.

For the maximum benefit of the patient, the treating physicians should be thorough with the differential diagnosis of adnexal masses and do risk assessment and carefully consider the clinical context for each individual patient. Tumour markers play a significant role in directing the management of the patient. It is ideal to have an accurate pre-operative diagnosis to prevent needless, extensive radical surgeries. The radiological investigations may suggest malignancy in some but histopathology is the gold standard investigation.

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