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Case Report

A Pandora's box: cystic neoplasm of the ovary

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ABSTRACT

Ovarian cyst is a rare neoplasm of the female reproductive system, accounting for approximately 2% to 3% of all ovarian pathologies. Germ cell tumours arise from the ovarian germinal elements. They are classified into as benign, borderline (proliferative), and malignant. Most tumors are benign, with malignant tumors accounting for less than 5% of cases. We now describe a case of large right ovarian cyst which was managed with right salphingo-oopherectomy and was subsequently reported to have ovarian germ cell tumor.

Keywords: Ovarian cyst, Malignant tumour, Germ cell tumour

INTRODUCTION

Ovarian cysts (OCs) are a common problem affecting the female population. About 20% of women experience the development of at least one pelvic mass at some point in their lives.[1] These cysts can form at any age but are more frequently observed during the reproductive years and the transition to menarche, which is driven by the body's natural hormone production. The majority are functional and tend to resolve on their own without medical intervention.[1] There are more than 30 different subtypes of adnexal tumours, with multiple different subcategories, and the correct characterisation of the pelvic masses is of paramount importance to guide the correct management. On that basis, different algorithms and scoring systems have been developed to guide the clinical assessment. The first scoring system implemented into the clinical practice was the Risk of Malignancy Index, which combines ultrasound evaluation, menopausal status, and serum CA-125 levels.[2] When developing a differential diagnosis for adnexal masses in childhood, the clinician must have a broad understanding of adnexal pathology and consider the patient's age, presenting complaints, physical examination findings, and imaging results to generate a list of possible diagnoses and the appropriate treatment plan.[3] Mixed germ cell tumors of the ovary are rare malignant neoplasms containing combinations of two or more types of germ cell element, such as dysgerminoma combined with teratoma, yolk sac tumor, choriocarcinoma, embryonal carcinoma, or polyembryoma, as well as any other possible combination of these tumor types.[6] In general, in the younger population, the goal of management is conservative, with observation and resolution of symptoms, prevention of complications, and, when necessary, proper treatment of malignant tumors while maintaining ovarian structure and function.

CASE REPORT

A 24 years old unmarried, sexually inactive woman presented to gynaecology outpatient department with complaint of insidious onset lower abdominal pain for 15 days, aggravated over last fifteen days along with a sensation of mass felt in the lower abdomen. There was no

complaint of associated nausea or vomiting, altered bowel or bladder habits. She reported mild decrease in appetite but there was no history of early satiety, loss of weight or contact with tuberculosis. She attained menarche at 13 years of age and had regular menstrual cycles. There was no family history of gynaecological, breast or gastrointestinal tract malignancies. On examination, she was comfortable at rest, with stable vitals and mild pallor. There was no lymphadenopathy or pedal oedema. Systemic examination was unremarkable. A tense cystic abdominopelvic mass corresponding to 24 weeks size gravid uterus, with well-defined borders, restricted vertical mobility was felt. Rest of the abdomen was soft. The baseline blood showed elevated Lactate Dehydrogenase (LDH) more than two times the normal and CA -125 was marginally raised; Rest tumor markers were within normal limits.

Table 1: Blood investigation.

Haemoglobin	9.3 gm/dl	AFP	<2ng/ml
Total counts	7960 /ul	Inhibhin B	40 pg/ml
Platelets	443000 /ul	LDH	743 u/l
Urea	10 mg/dl	CA-125	39.8 u/ml
Creatinine	0.43 mg/dl		
Blood group	A positive		

Transabdominal ultrasound revealed a well-defined abdominopelvic multiloculated anechoic cystic lesion of size 25cm X 17 cm X 11 cm with increased vascularity and internal septations. The right ovary was not visualised separately. There was bilateral hydroureteronephrosis. ORADS score was 4.

Figure 1: Cyst content.

Magnetic resonance imaging of abdomen and pelvis suggested a large (XYZ cc) well defined non enhancing cystic lesion arising from right adnexa with multiple septations, solid components and a possible torsion. The mass extended anteriorly to abdominal wall, posteriorly compressed inferior vena cava and laterally displaced the bowel loops. The right ovary was not visualised separately. Diagnosis of a right ovarian borderline epithelial neoplasm with probable torsion of residual right ovary was made. Her chest X ray was reported to be normal. A provisional diagnosis of right ovarian malignant cystic neoplasm was made. Staging laparotomy was performed under combined epidural spinal anaesthesia. Abdomen was opened with midline vertical incision. Intraoperatively, there was no ascites and hence peritoneal washings were sent for cytological analysis. Systematic palpation of intra-abdominal organs did not reveal any abnormality. Right ovary was incorporated into the large cyst of size 25 X 15 X17 cm along with presence of few solid components and mucinous material. The right fallopian tube was stretched out over the cyst. Uterus, left tube and ovary were normal in size.

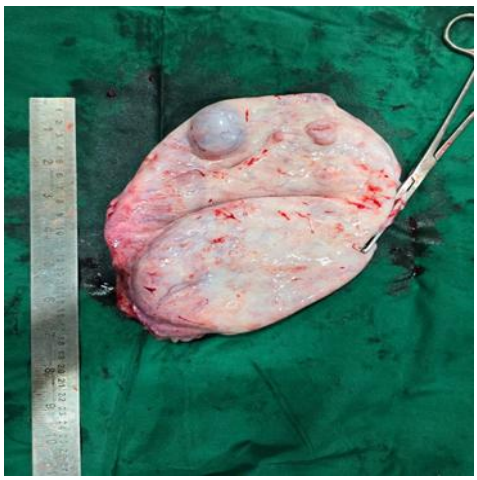

Figure 2: Gross appearance.

Right salphingo-oophorectomy was performed with complete removal of cyst, ensuring no spillage of contents. On cut opening the specimen, 2000 mL of mucinous and haemorrhagic fluid was drained and the same was sent for cytological evaluation. The histopathology of ovarian specimen showed mucinous borderline tumour with features consistent with embryonal carcinoma with no stromal or lympho vascular invasion. The woman recovered uneventfully and sutures were removed on post operative day 8. In collaboration with medical oncology, she was started on Bleomycin sulphate, Etoposide Phosphate and Cisplatin (BEP) regimen. Psychological counselling was done for the woman and family members. On follow up at three months, the woman was found to be doing well.

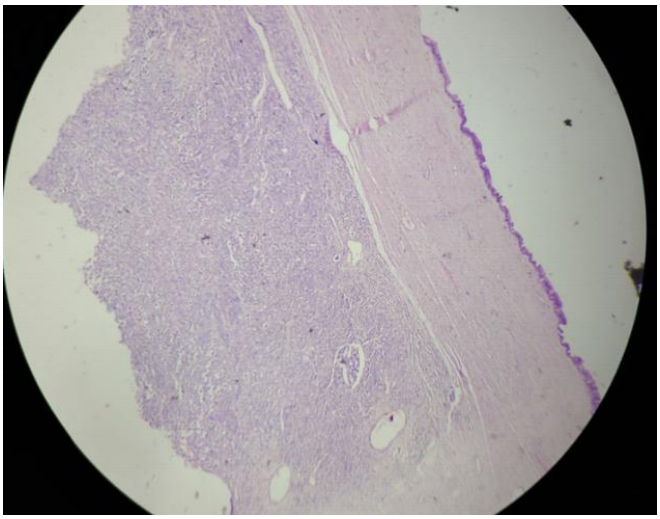

Figure 3: Histopathological appearance.

DISCUSSION

Globally, approximately 7% of women will develop an OC during their lifetime. A substantial screening study revealed that the incidence of OC among healthy postmenopausal women in Europe is 21.2%. OC have the potential to become malignant, and they can also undergo torsion or twisting, leading to pain, bleeding, infection, and even death. Often dubbed the "silent killer", OCs frequently go undetected in women until they are large enough to be felt externally or have significantly enlarged.[1] Germ cell tumours account for 1/3rd of all ovarian neoplasms. Typically occurs at a younger age. Clinical manifestations and examinations of ovarian cystic tumors lack specificity. A combination of tumour markers and imaging examinations can aid in diagnosis Germ cell tumors derive from primitive germ cells of the ovary. The first scoring system implemented into the clinical practice was the Risk of Malignancy Index, which combines ultrasound evaluation, menopausal status, and serum CA-125 levels.

Today, current guidelines regarding female patients with adnexal masses include the application of International Ovarian Tumours Analysis simple rules, logistic regression model 1 (LR1) and LR2, OVERA, cancer ovarii non-invasive assessment of treating strategy, and assessment of different neoplasia's in the adnexa.[2] mixed germ cell tumor (immature tetatoma and yolk sac tumor) with rhabdomyosarcomatous component of embryonal type in a 15-year-old girl, ovarian mixed germ cell tumor composed of polyembryoma and immature teratoma in a 41 year old woman Teilum offered the most accepted theory about the histogenesis and interrelations of the various types of germ cell tumors.[7] Teilum considered dysgerminoma as a primitive germ cell neoplasia which did not reach the potential for further differentiation. In turn, embryonal carcinoma was considered a germ cell neoplasm containing multipotential cells able to differentiate in two different directions. If the differentiation follows the embryonal direction, the result will be the development of teratoma tumors, and if the differentiation will be toward extra-embryonal direction, the result will be the development of endodermal sinus tumors (yolk sac tumor) or choriocarcinoma (trophoblastic tumor). Immunohistochemistry is important in making diagnosis of mixed germ cell tumor.

AFP and hCG are the characteristic tumor markers for germ cell tumors. AFP has proved to be positive in most embryonal carcinomas and in virtually all endodermal sinus (yolk sac) tumors, whereas hCG has proved to be a useful marker in choriocarcinoma and in some embryonal carcinomas. Most embryonal carcinomas stain for CD30, and OCT4 has been found to be consistently positive in embryonal carcinoma. SALL4 is a novel sensitive and special marker of ovarian primitive germ cell tumors. It is strongly positive in more than 90% tumor cells in all yolk sac tumors, dysgerminomas, gonadoblastomas, and embryonal carcinomas and variable in immature teratomas, SALL4 is a more sensitive marker than PLAP, glypican-3. And CD117 can be used as a diagnostic marker for yolk sac tumor.

EMA and CK7 are makers of epithelial cells; here they are important in differential diagnosis between clear cell carcinoma and yolk sac tumor. And CD10 is positive in stromal cells of endometriosis. These markers are positive in corresponding component in this case.[6] This a case report of a 24 years old unmarried, sexually inactive woman presented to gynaecology outpatient department with complaint of insidious onset lower abdominal pain for 15 days, aggravated over last fifteen days along with a sensation of mass felt in the lower abdomen. A tense cystic abdominopelvic mass corresponding to 24 weeks size gravid uterus, with well-defined borders, restricted vertical

mobility was felt. Rest of the abdomen was soft. The baseline blood showed elevated LDH more than two times the normal and CA -125 was marginally raised; Rest tumor markers were within normal limits. Transabdominal ultrasound revealed a well-defined abdominopelvic multiloculated anechoic cystic lesion of size 25cm X 17 cm X 11cm with increased vascularity and internal septations.

The right ovary was not visualised separately. There was bilateral hydroureteronephrosis. ORADS score was 4. Staging laparotomy was performed under combined epidural spinal anaesthesia. The histopathology of ovarian specimen showed Mucinous borderline tumour with features consistent with embryonal carcinoma with no stromal or lymph vascular invasion.

Table 2: Comparison of present study with previous studies.

Parameter	Present study	Previous studies (literature findings)
Age at presentation	24 years	Common in adolescents and young women, peak <30 years.[12]
Clinical presentation	Lower abdominal pain, abdominal mass	Abdominal pain, palpable mass, or distension common.[12]
Tumor size	~25×17×11cm	Often large and rapidly growing at diagnosis (>10 cm).[11,12]
Tumor markers	LDH elevated; CA-125 mildly raised	AFP/hCG elevated by subtype; LDH in dysgerminoma.[11,12]
Imaging findings	Multiloculated cyst with septations; o-rads 4	Complex cystic-solid masses on ultrasound scoring (10)
Risk stratification	O-RADS US 4	IOTA, RMI, ADNEX, O-RADS recommended.[9,10]
Histopathology	Mucinous borderline tumor + embryonal carcinoma	Mixed germ cell differentiation described.[11-13]
Immunohistochemistry	AFP, hCG, CD30, OCT4, SALL4 positive	SALL4 sensitive; AFP/hCG subtype markers.[14]
Management	Staging laparotomy	Surgical staging with fertility-sparing approach.[12]
Prognosis	Favorable without invasion	Generally good survival with early treatment.[12]

O-RADS US 4

Lesions with an intermediate risk of malignancy (10% to <50%) - needs ultrasound specialist review or MRI as well as management by a gynaecologist with gynaecological oncology support or solely by a gynaecological oncologist

unilocular cyst with a solid component, any size, 1-3 papillary projections, any color score

multilocular cyst with solid component, any size, color score 1-2

multilocular cyst without solid component,>10 cm, smooth inner wall with color score 1-3, any size smooth inner wall with color score of 4, any size with an irregular inner wall or irregular septations of any color score, solid - smooth outer contour, any size, color score 2-3, bilocular irregular cyst of any size, no solid components

CONCLUSION

Ovarian germ cell tumors account of ovarian malignancy and predominantly affect women in reproductive age. It has implications with respect to fears and concerns regarding fertility. Clinical manifestations and auxiliary examinations of ovarian cystic tumors lack obvious specificity. When necessary, a combination of tumor markers and imaging examinations can aid in diagnosis.

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