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Tumor Discovery

CASE REPORT

Challenges and considerations in diagnosing mature teratoma during pregnancy: A case report

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Abstract

The progression of rapidly growing teratomas in pregnancy may be influenced by hormonal and genetic factors. The current report is about a unique case involving a mature teratoma with rapid growth characteristics, yet it did not lead to any complications throughout pregnancy of a primigravida. The benign mature teratoma was identified via antenatal ultrasound during the first trimester. In this case, the patient experienced no adverse effects, and the size of the ovarian teratoma showed a gradual increasing trend during pregnancy without resulting in any complications. In summary, mature teratoma is a benign tumor with a good prognosis, and if fetal distress is detected, cesarean section should be recommended.

Keywords: Mature teratoma; Pregnancy; Fetal distress; Cesarean section

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1. Introduction

Cystic teratomas represent a form of germ-cell tumor distinguished by the presence of mature tissues from all three embryonic layers: ectoderm, mesoderm, and endoderm. Remarkably, evidence of teratomas dates back to 2000 B.C., demonstrating the long-standing recognition of these tumors. The first formally recorded case of a mature cystic teratoma was made by Johannes Scultetus in 1659, who documented the ovarian tumor findings of a young woman during the autopsy, describing it as a "dermoid cyst."[1] Rudolf Virchow introduced the term "teratoma" in 1863, derived from the Greek word "teras," which means monster.[2] Mature cystic teratomas are considered benign, with an average growth rate of 1.8 mm/year, although malignant transformation has been reported in rare cases. The development of mature cystic teratomas is associated with several risk factors, including late menarche with menstrual irregularities, alcohol use, a history of cystic teratomas, fewer pregnancies, infertility, and adolescent's physical activity that may contribute to an anovulatory cycle.[3] Mature teratomas are benign tumors of the ovary that have a generally favorable prognosis and account for <1% of ovarian tumors. Their occurrence during pregnancy is uncommon.[4] Notably, the hormonal changes during pregnancy cause an increase in the size of mature teratoma.

The current report is about a unique case involving a mature teratoma with rapid growth characteristics, yet it did not lead to any complications throughout pregnancy of a primigravida.

2. Case presentation

A 21-year-old primigravida at a gestational age of 37 weeks presented with a complaint of sudden abdominal pain and visited our gynecology department located at the periphery of Uttar Pradesh, a northern state in India. Physical examination was normal. Systemic investigations were carried out, and all were normal. Blood investigation showed mild leukocytosis. Electrolytes, amylase, lipase, liver function, and renal function tests were within normal range. Ultrasonography was conducted during the first trimester of pregnancy, indicating a small dermoid cyst. The patient was followed up upon this clinical discovery. Ultrasonography during the third trimester showed a left-sided well-defined homogeneous hyperechoic mass measuring 9 × 6 cm. Tumor markers such as CA-125, lactate dehydrogenase (LDH), alpha-fetoprotein (AFP), human chorionic gonadotropin (b-hCG), and human epididymis protein 4 were normal. On abdominal examination, left lower quadrant tenderness was observed. A single live intrauterine pregnancy was noted on ultrasonography with a fetal heart rate of 80 bpm. In this case, due to fetal distress, the patient was recommended by a gynecologist to undergo a cesarean section. Interestingly, no complications due to the ovarian mass were found during pregnancy. Then, cesarean section was done, concomitant with left salphingoopherectomy, delivering a live male newborn. Intraoperative findings of the right ovary and the right fallopian tube were normal. The surgical procedure was well tolerated by the patient, and a surgical specimen was sent for histopathological examination. The patient's post-operative course was uneventful.

2.1. Gross examination

Based on the gross examination shown in Figure 1, the external surface of the ovary received, measuring 9.5 × 9 × 5.5 cm, was smooth and glistening. Upon sectioning, a unilocular cyst embedded with pultaceous material, hair, and sebum was identified. A fallopian tube measuring 3 cm was seen but appeared unremarkable.

2.2. Microscopic examination

The tumor mainly consists of mature elements such as squamous epithelium, pseudostratified ciliated columnar epithelium, adnexal structure, hair follicles, and fibroadipose tissue, as shown in Figure 2. The immature component was not seen.

3. Discussion

The reported incidence of ovarian tumors during pregnancy varies between 1% and 4%.[5] During pregnancy, mature cystic teratomas are the most common benign ovarian tumors, comprising 24 – 40% of all cases.[6] It is a benign cystic tumor made up of tissues from the endoderm, mesoderm, and especially the ectoderm, affecting tissues such as teeth, hair, and sebum.[7]



Figure 1. Gross image of ovarian mass with hair follicle, sebum, and pultaceous material. Left: Ovary shows smooth and glistening external surface; right: Cut section shows hair, pultaceous material.

Cystic teratomas are mostly asymptomatic, and benign ovarian tumors are also known as dermoid cysts. In most cases, they are detected incidentally during radiological imaging, routine physical examinations, or pelvic and abdominal surgeries performed for unrelated conditions. When symptoms are present, the most frequently reported one is lower abdominal or pelvic pain. This may be followed by the discovery of a palpable abdominal or pelvic mass during examination. Some patients may notice an increase in abdominal girth due to the growing size of the mass.

As the tumor enlarges, it can exert pressure on surrounding organs, leading to gastrointestinal symptoms such as constipation or bloating, as well as urinary symptoms such as increased frequency or urgency. In more advanced stages, systemic symptoms, including fever, cachexia (severe weight loss and muscle wasting), intense abdominal pain, and abnormal vaginal bleeding may occur, indicating potential complications or malignant transformation.

One of the most critical and common complications is ovarian torsion, where the ovary twists around the supporting ligaments. This leads to an acute onset of intense abdominal pain, often associated with nausea and vomiting. Ovarian torsion is a surgical exigency and requires immediate medical attention.

During the clinical assessment, a thorough history – with a focus on gynecological details – is essential. Physical examination should include a careful bimanual pelvic examination to analyze the size along with the mobility of the uterus and adnexa, as well as any tenderness or masses. Abdominal examination may also reveal distension or localized pain. A comprehensive clinical evaluation is

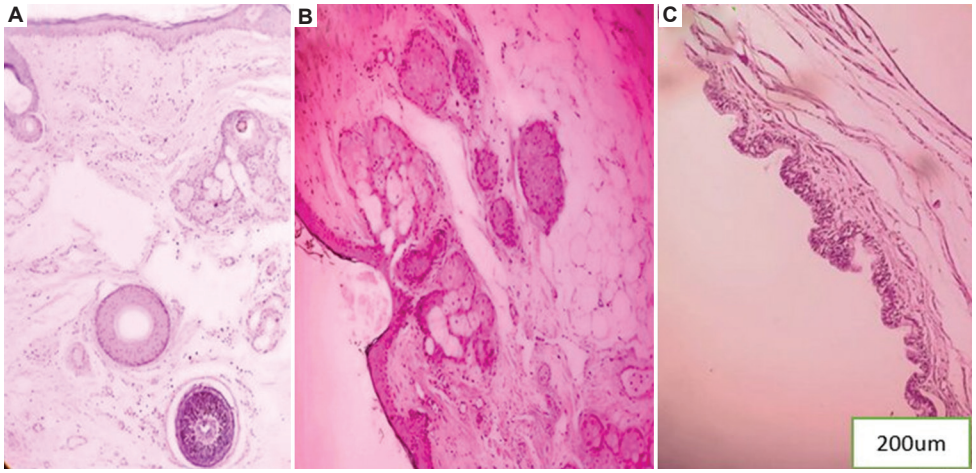


Figure 2. Microscopic examination of the specimen shows a cyst wall, stratified squamous epithelium, adnexal structure, hair follicle, and mucinous epithelium. (A) Section shows stratified squamous epithelium with the hair follicle. (B) Section shows sebaceous gland. (C) Section shows mucinous epithelium. Scale bar: 200 μm; magnification: ×10; staining: Hematoxylin and Eosin.

crucial for early detection, timely intervention, and optimal management of cystic teratomas and their complications.

A definitive tumor marker is unavailable for diagnosing mature cystic teratomas; however, serum markers such as AFP, hCG, LDH, and CA-125 may contribute to diagnostic evaluation and monitoring.[8] Mature cystic teratomas are typically asymptomatic unless complicated or significantly enlarged. Their diagnosis can be difficult, often mimicking other conditions in both clinical and paraclinical assessments.[9,10]

Acute abdominal pain is a common complaint during pregnancy, and its differential diagnosis is broad and often complex. The challenge lies in the wide range of potential etiologies, including appendicitis, diverticulitis, ureteral colic, ectopic pregnancy, degenerating pedunculated fibroids, hemorrhagic ovarian cysts, tubo-ovarian abscesses, polycystic ovaries, simple cysts, endometriomas, cystadenomas, and other ovarian tumors. Although less common, ovarian torsion secondary to ovarian masses should also be considered in the differential diagnosis.[11]

Adnexal torsion is the most significant complication of mature cystic teratomas during pregnancy, occurring in about 8% of cases – primarily in the first and early second trimesters.[12] Although ovarian torsion is more commonly associated with ovarian hyperstimulation syndrome, instances caused by mature teratomas are infrequently reported. Most cases occur in the first trimester, with fewer in the second and rare occurrences in the third.[13]

Ultrasound is the reference standard for evaluating ovarian tumors during pregnancy due to its non-invasive nature and diagnostic reliability. When further assessment is needed, magnetic resonance imaging (MRI) offers superior soft-tissue contrast and additional diagnostic information.[14] On ultrasound, cystic teratomas typically present as heterogeneous masses with echogenic foci and posterior acoustic shadowing caused by components such as calcification, sebum, and hair. Specific findings may include fat-fluid and hair-fluid levels. Characteristic ultrasonographic features include the Rokitansky nodule, iceberg sign, dot-dash pattern (dermoid mesh), and floating balls sign. Transvaginal ultrasound, with a sensitivity of 57.9% and a specificity of 99.7%, outperforms abdominal ultrasound in detection and is as accurate as MRI in identifying and characterizing these tumors.[15,16]

Ovarian cystic teratomas may lead to several complications. Early and precise diagnosis plays a key role in minimizing associated morbidity and mortality. Complications of ovarian cystic teratomas include torsion, rupture, infections, adhesions, malignant transformation, and anti-N-methyl-D-aspartate receptor encephalitis related to ovarian tumors.[17] Mature teratomas are asymptomatic in most affected women; therefore, a proper diagnostic process is required. Since torsion is a common complication among the affected women, surgical intervention is often necessary.

Treatment of mature cystic teratomas is individualized based on the presenting symptoms, radiologic characteristics, risk of malignancy, patient age, and fertility preservation considerations. Surgical excision is the standard of care, with procedures categorized as either ovary-sparing surgery or oophorectomy performed through laparoscopy or laparotomy, depending on the clinical context.[18] Laparoscopic surgery remains the gold standard for the management of mature cystic teratomas. When feasible, cystectomy is the treatment of choice to conserve ovarian parenchyma and preserve reproductive

potential. In cases where the tumor extensively involves the ovary, rendering the parenchyma non-viable, oophorectomy or salpingo-oophorectomy becomes necessary.[19]

Surgery during the first trimester is generally avoided unless the patient presents with acute symptoms suggestive of adnexal torsion, in which case urgent intervention is warranted.[20] For asymptomatic cases, a follow-up ultrasound in the early second trimester is indicated to evaluate the persistence of the lesion. When the mass appears benign, is smaller than 6 cm, and shows no growth, the risk of complications remains low, supporting the use of an expectant management approach. However, any increase in tumor size or change in appearance may prompt consideration for surgical treatment.[4] Younger patients, as well as those having bilateral or large dermoid cysts, should be monitored closely. Taken together, treatment decisions should be individualized, carefully balancing the risks of torsion, rupture, or labor obstruction against the potential for unnecessary surgical intervention and associated risks to both the mother and fetus.[21]

Women presenting with ovarian cysts or tumors during pregnancy should receive counseling about the risk of recurrence, with close ultrasound surveillance recommended throughout gestation. Those with a prior history of ovarian tumors should also be counseled preoperatively on recurrence risks and the potential implications for fertility.[22] Laparoscopic salpingo-oophorectomy, performed with an endoscopic retrieval bag, is considered the standard treatment for post-menopausal and perimenopausal women presenting with a large teratoma. In contrast, laparoscopic cystectomy may be a more suitable and conservative option for younger women, preserving ovarian function when feasible.[23] Women diagnosed with ovarian cysts or tumors during pregnancy should be thoroughly counseled and closely monitored to identify and manage any potential complications.

This case highlights the importance of a comprehensive approach – integrating clinical assessment, laboratory findings, and diagnostic imaging – while making decisions that prioritize the safety of both the mother and the fetus. Despite the final diagnosis being pathological, it is necessary to carefully interpret all parameters to preserve the pregnancy and ultimately ensure the successful delivery of a healthy baby.[24]

4. Conclusion

Mature teratoma is a benign tumor with a good prognosis. To avoid the missed diagnosis of any rare or synchronous malignancies, a gross examination of sufficient specimens containing both solid and suspicious areas of the ovarian cyst is required. Diagnosis of mature teratoma is confirmed through histopathological examination. If a mass is larger, complications, such as ovarian torsion, rupture, malignant transformation, infection, and obstructed labor, may occur, and surgical intervention is generally selected for management if the patient would like to preserve fertility. In this case, cesarean section was recommended as fetal distress was detected, and no complications were reported by or detected in the pregnant patient despite the large ovarian mass.

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Conflict of interest

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Author contributions

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Ethics approval and consent to participate

Patient gave verbal consent before her participation.

Consent for publication

Patient consented on the publication of her data.

Availability of data

Not applicable.

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