Jurnal Eduhealth
Volume 15 , Number 04, 2024, DOI 10.54209/eduhealth.v15i04
ESSN 2808-4608 (Online)
https://ejournal.seaninstitute.or.id/index.php/healt

Cyst Torsion in Mature Cystic Ovarian Teratoma: A Case Report

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Article Info
Keywords:
Torsion,
Cyst,
Teratoma,
Ovary,
Mature.

ABSTRACT
Mature cystic teratoma is an ovarian germ cell tumor with the highest prevalence in women of reproductive age. Approximately 20% of patients are asymptomatic when the tumor is found. Acute pain may occur when there are complications. Echogenic nodules characterized by echogenic sebaceous substance and calcifications are the most common ultrasonographic findings. Generally, cystectomy is safe and effective in preserving ovarian function. *Laparotomy* and *oophorectomy* may be considered in cases with high risk of malignancy. The objective of this case report is to discuss a case of cyst torsion in an adult cystic ovarian teratoma, including its diagnosis and management. We report a case of cyst torsion in mature cystic ovarian teratoma in a 26-year-old woman with initial complaints of abdominal pain. The patient presented with complaint of abdominal pain 2 days before admission. There was a palpable mobile and painful mass in the lower left abdomen. Ultrasonography examination showed a cystic image of 11.6 cm x 7.2 cm x 9.3 cm with calcification. Left ovarian torsion was found intraoperatively, thus unilateral left salpingo-oophorectomy was performed with additional pathological results showing a mature cystic teratoma. The specimen was sent to the anatomical pathology confirming a mature cystic teratoma. ANC examination should not only focus on the fetus and uterus, but also require assessment of bilateral adnexa. Salpingo-oophorectomy can be avoided if detection can be done earlier.

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INTRODUCTION

Mature cystic teratoma (MCT) or ovarian dermoid cyst is the most common ovarian germ cell tumor in young women. MCT can be found in women of all ages, but the highest prevalence is found in women of reproductive age. Acute pain may occur when there are complications. Approximately 20% of patients are asymptomatic when the tumor is found. Tumors are usually found incidentally on imaging performed for other indications (Saleh et al., 2021).

This tumor is formed by tissue originating from cells that differentiate from three germ layers, namely ectodermal, mesodermal, and endodermal. Cystic echo with echogenic nodules characterized by echogenic sebaceous substance and calcifications is the most common ultrasonographic appearance of mature teratomas (Sales, 2020). Risk factors include late

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menarche and long-term irregular menstruation, history of cystic teratoma, lower parity, infertility, excessive alcohol consumption, and exercise (Ahmed & Lotfollahzadeh, 2023).

Management of mature teratoma depends on symptoms, imaging results, and patient preference. Laparoscopy and laparotomy are used in different cases, weighing their respective benefits and risks. In general, laparoscopic cystectomy is a safe and effective option to preserve ovarian function. Laparotomy and oophorectomy may be considered in women with high risk of malignancy (Sinha & Ewies, 2016).

Malignant transformation of MCT is a rare complication with an incidence of 1–2% and particularly in postmenopausal women (Rha et al., 2004). Squamous cell carcinoma is the most common, accounting for about 80–85% of malignant transformations (Goudeli et al., 2017). Here we report the case of a 26 years old woman presenting with abdominal pain which was later diagnosed with a torsion of mature cystic teratoma of the left ovary.

CASE

A 26-years-old female patient presented to the Internal Medicine Department with complaints of abdominal pain. The patient complained of abdominal pain since 2 days before admission. During physical examination, a mass was felt in the lower left abdomen, mobile, and painful. The patient has 2 children, where last delivery was completed 1.5 years ago. There was no history of previous surgery. Ultrasonography (USG) examination showed a cystic image measuring 11.6 cm x 7.2 cm x 9.3 cm with a volume of 416 cc accompanied by calcification (Figure 1) and twisting appearance on Doppler examination. Intraoperative findings showed torsion of the left ovary, therefore Unilateral Salpingo-oophorectomy was performed (Figure 2). The results of the pathological anatomy of the specimen were Mature Cystic Teratoma.

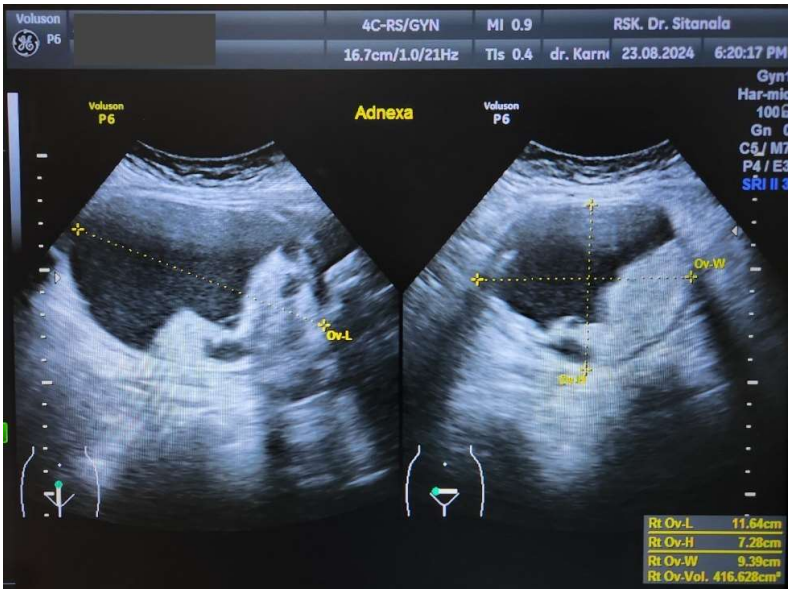

Figure 1. Ultrasonography examination

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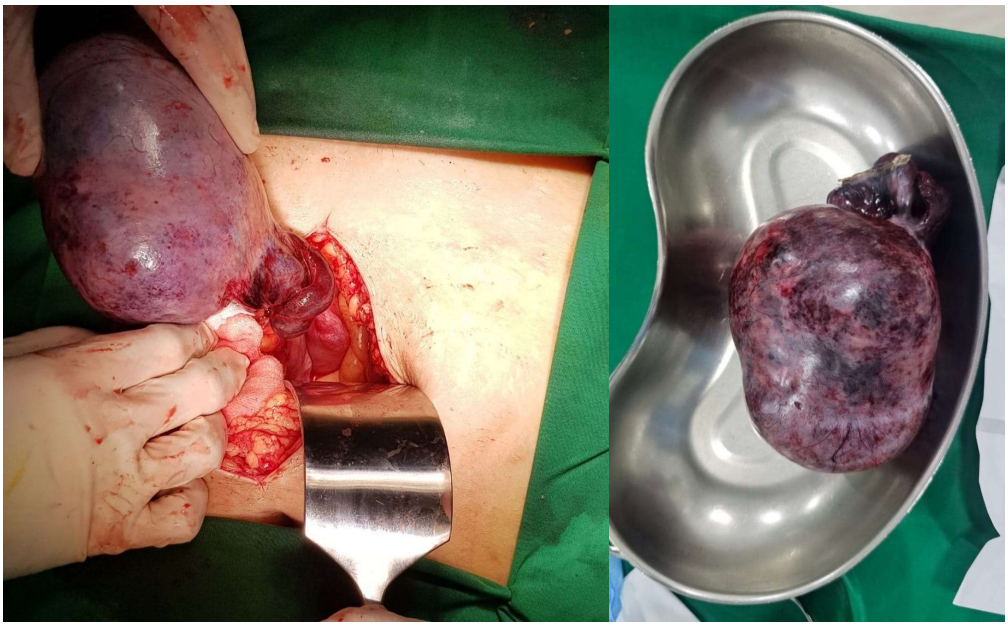

Figure 2. Intraoperative findings of torsion of the left ovary

DISCUSSION

There are three types of ovarian teratomas, namely mature teratomas, immature teratomas, and monodermal teratomas. Mature teratomas include mature cystic teratomas, also called ovarian dermoid cysts. The reported incidence is around 1.2–14.2 cases per 100,000 people per year. The dominant type of mature teratoma is cystic, which generally contains skin, hair, nerve tissue, and sebaceous substance. Mature teratomas are often diagnosed in the reproductive age. Some of them are detected during routine examination or discovered during pregnancy. Although most mature cystic teratomas are benign, the reported incidence of malignant transformation is 0.5% to 3% in MCTs, especially in elderly women. Squamous cell carcinoma is the most common type (Atwi et al., 2022; Gadducci et al., 2018).

The clinical presentation of the tumor is variable. Approximately 20% of mature teratomas are asymptomatic at the time of diagnosis and are usually detected incidentally during imaging studies, pregnancy, or abdominal or pelvic surgery for other reasons. Larger tumors may present with abdominal pain, symptoms of increased pelvic pressure, and a palpable mass on physical examination of the abdomen. Acute abdominal pain occurs in 5–10% of all mature teratomas and is often due to ovarian torsion. Patients may also experience nausea, vomiting, fever, and abnormal bleeding. Several risk factors for spontaneous dermoid rupture occur due to increasing pressure from cyst fluid that occurs continuously along with the enlargement of the cyst during pregnancy, cyst torsion with infarction, or direct trauma (Guzmán et al., 2018). The patient in the case is a 26-years-old woman who presented with abdominal pain since 2 days SMRS. During physical examination, a mass was felt in the lower left abdomen, mobile, and painful. The patient has 2 children, where last delivery was completed 1.5 years ago.

The incidence of pregnancy in benign cystic teratoma is reported to be around 10.5%, but to date there is still no evidence to suggest that pregnancy will increase the incidence of

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infection, rupture, or malignancy of this ovarian neoplasm. Mature ovarian cystic teratoma is rarely produce HCG. Therefore, when there is an increase in serum HCG levels in mature ovarian teratoma, pregnancy and other malignancies such as dysgerminoma, polyembryonoma, trophoblastic tumor at the placental site, or choriocarcinoma should be excluded (Coleman et al., 2022; Prueksaritanond et al., 2020).

Ultrasonography can be used to diagnose most cases of mature ovarian teratomas, which are characterized by echogenic sebaceous substance and calcification. Dermoid plugs or Rokitansky nodules strongly suggestive of teratoma. These are characterized by one or more highly echogenic nodules within the cyst. Plugs vary from single to covering almost the whole cyst. Discrete hyperechogenic foci with posterior shadowing suggestive of ectopic teeth may be more specific for the diagnosis of MCT. Some other sonographic characteristics include dermoid mesh, tip of iceberg sign, and fat-fluid level. CT and MRI are alternative methods for diagnosing dermoid cysts, both of which are more sensitive to fat than ultrasonography (Rha et al., 2004; Sales, 2020). Ultrasonography examination showed a cystic image measuring 11.6 cm x 7.2 cm x 9.3 cm with a volume of 416 cc accompanied by calcification in it accompanied by a twisting image on Doppler examination.

The macroscopic pathological appearance of mature cystic teratoma is typical. The tumor size varies, with an average diameter of 7 cm, and often contains well-differentiated cells from all three germ layers. Histologically, squamous epithelium lines the cyst wall, and its outer surface is covered by ovarian stroma. In 88% of cases, the tumor is unilocular with Rokitansky nodules, which contain hair, teeth, and other tissues. The tumor cyst is filled with sebaceous material, which is liquid at body temperature and semisolid at room temperature (Sahin et al., 2017).

The sonographic appearance of immature teratomas and malignant transformation is nonspecific. Histologically, immature teratomas are usually larger in size, with an average diameter of 18 cm. They may be completely solid or contain some cystic components. In MCTs with malignant transformation, septa and capsules are present on the cyst surface rather than a smooth surface. Transmural growth of Rokitansky nodules may indicate malignant change. Microscopically, immature teratomas may contain tissue from all three germ layers, but neuroepithelium is more frequently seen within the tumor than in the benign portion, and necrosis is thought to be a sign of malignancy. Adhesion to surrounding structures, wall thickening, and the presence of necrosis and hemorrhage may be signs of malignant transformation (Sales, 2020; Sari & Nizar, 2021). The results of the anatomical pathology of the specimen were Mature Cystic Teratoma.

Management of mature teratomas is influenced by the risk of malignancy, the age of the patient, and the importance of fertility reserve. Surgical removal is an effective method for ovarian dermoid cysts. Surgery is classified as ovary-sparing surgery (OSS) or oophorectomy, either by laparoscopy or laparotomy. Generally, cystectomy is performed only to remove the cyst so that the remaining ovary can be preserved; however, follow-up is required to exclude recurrence, which occurs in 4-5% of cases. Teratomas with a diameter of approximately 5 cm in premenopausal women are considered to require surgical resection (Cong et al., 2023).

Oophorectomy is the standard of care in postmenopausal women and should be considered in perimenopausal women with multiple teratomas in a single ovary and in women

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with large cystic teratomas destroying a large area of normal ovarian tissue. It is important to make a trade-off between preserving fertility and preventing recurrence. OSS should always be considered in cases where there is no evidence of lymphadenopathy or liver/lung metastases, normal tumor markers, no calcifications, or other specific radiologic findings. Ovarian masses in postmenopausal women, even those with MCT imaging, should be carefully evaluated for any malignant changes (Spinelli et al., 2021). Intraoperative findings showed torsion of the left ovary, thus unilateral salpingo-oophorectomy was performed.

CONCLUSION

Mature cystic teratoma is one of the most common ovarian tumors in young women. This tumor consists of tissue derived from the ectoderm, mesoderm, or endodermal layers. Clinical presentation is associated with tumor size and complications. Imaging is very helpful in the diagnosis and treatment. Management of MCT depends on clinical symptoms, risk of malignancy, patient age, and the need to preserve fertility. Better knowledge of epidemiology, clinical features, and imaging results can help in making an accurate diagnosis and then guide the doctor to make the most appropriate treatment plan. In this case, it is likely that a cyst was already present during antenatal examination (ANC) of the second child. Therefore, examination of ANC should not only focus on the fetus and uterus, where ideally assessment of the bilateral adnexa should also be performed. When detected early, surgical approach via cystectomy can be performed, preventing salpingo-oophorectomy as in the current case.

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