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Case Report

Acute chemical peritonitis secondary to ovarian dermoid rupture: a rare complication

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ABSTRACT

A dermoid cyst is also known as a mature cystic teratoma and is one of the most common ovarian germ cell tumors of women, particularly in the premenopausal age group. This tumor is composed of skin, hair, teeth and sebum, enclosed in a fibrous tissue. A ruptured dermoid cyst can be missed and can have serious morbidity, and imaging modality can help in the diagnosis, as was done in this case. A 42-year-old parous woman presented with acute onset, vague, lower abdominal pain. The patient had a history of acute onset abdominal pain for two days, that worsened. An ultrasound followed by CT scan revealed a dermoid cyst that had ruptured following which an exploratory laparotomy was done, which confirmed the finding. Although a dermoid cyst is the most common ovarian germ cell tumor, a ruptured ovarian dermoid cyst is a very infrequent complication. The resulting peritonitis from the rupture often presents with acute or chronic peritonitis. A good clinico-radiological correlation can help us come to a diagnosis and lead us to the surgical intervention that is required. A ruptured dermoid cyst can present with vague symptoms. A high degree of suspicion is required to lead us to the timeliest surgical intervention.

Keywords: Dermoid, Peritonitis, Rupture, CT imaging

INTRODUCTION

An ovarian dermoid cyst is a benign tumor that develops in the ovary. It is a common type of benign ovarian germ cell tumor accounting for 10-25% of ovarian tumors.[1] Also known as mature cystic teratoma, a dermoid cyst is a benign tumor. Dermoid cysts contain mature and immature tissue, consisting of hair, skin, teeth, sweat glands and sebaceous glands and bone tissue and nerves at times-all derived of the three germ cell layers.[2] These are mostly unilateral with around 10-15% found in bilateral ovaries. This cyst is often covered by a thick capsule and rupture is rare.[3] Among other complications are torsion (16%), rupture (1-4%), infection (1%), autoimmune hemolytic anemia (<1%) and malignant transformation (1-2%).[2,4]

One of the complications of a ruptured dermoid cyst is chemical peritonitis, which although rare and unexplained, is a serious complication. The leakage of the sebaceous material and other components from the cyst into the abdominal cavity can trigger an inflammatory response thus resulting in chemical peritonitis. This can result in acute or chronic signs and symptoms and may even require surgical intervention and extensive lavage.[4-6]

CASE REPORT

A 42-year-old female, para 3 (all 3 vaginal deliveries), presented in emergency department with complaints of acute onset abdomen pain which was dull in nature localized in lower abdomen, more so in the left iliac region and non-radiating, for last 2 days. There was associated history of 2 episodes of vomiting on the morning of arrival and one episode of fever (99°F). There was no history of trauma or prior similar incident. Her periods were 10 days back and otherwise she had no menstrual complaints. She had 3 previous vaginal deliveries, and no abortions. Her surgical history was not significant. Her last bladder and bowel movements normal.

On examination, the patient appeared anxious, had a temperature of 99.2°F and a pulse rate and blood pressure of 110/min and 108/70 mmHg respectively. Her respiratory rate was 22/min and oxygen saturation of 99% on room air. On palpation abdomen was soft, but there was generalized tenderness and rebound tenderness but no guarding and rigidity. No mass was palpable abdominally. Per speculum examination was normal, while per vaginal examination revealed tenderness and a mass felt in the left adnexa, partially occupying anterior fornix.

Preliminary investigations were sent, and showed a normal hemoglobin, raised leukocyte counts of 14 x 10^9/l and a raised neutrophil count of 90. Urine analysis was not significant, while her liver enzymes, blood urea and creatinine were well within normal limits. Tumor markers assessment showed no significant abnormality.

A pelvic ultrasound was done, that revealed a large, solid cystic mass in the left adnexa measuring 6×6×5 cm. The mass had hyperechoic components and ground glass echoes, and an area showed posterior shadowing. There was however no increased vascularity, and a provisional diagnosis of dermoid cyst was made. A CT scan of abdomen and pelvis demonstrated a smooth, well-defined lesion in the left adnexa measuring 5.6×5.5×6.2 cm in size, most likely ovarian origin. There were multiple fat density areas, fat-fluid levels (Figure 1 and 3) and a focus of calcification noted in the lesion. The calcific focus measures 1.8 cm in width. The lesion abutted the anterior abdominal wall and laterally the iliac vessels. No infiltration at the pelvic walls seen. There was extensive soft tissue stranding of the peritoneum noted beneath the anterior abdominal wall from the epigastric region/ hypochondrium to the pelvis. Mild nodularity of the omentum was seen (Figure 2). There was mild free fluid noted in the pelvis. Fat attenuating lesions were seen intra-abdominally (Figure 2). CT scan imaging findings were representative of a ruptured left ovarian dermoid cyst with peritonitis(likely). Differential diagnosis was that of peritoneal carcinomatosis.

Upon diagnosis of chemical peritonitis secondary to dermoid cyst rupture, an emergency laparotomy was performed. Upon opening the abdomen, there was a copious amount of lipid laden fluid within the peritoneal cavity with hair and few calcific nodules coating omentum, the uterus, as well as in the pouch of Douglas and paracolic gutters, consistent with the contents of a ruptured dermoid cyst. The bowel was also edematous and coated with phlegmonous and fibrinous material. A 4×5×6.5 cm left ovarian dermoid cyst was seen, with a rent posteriorly for a length of 1.5 to 2 cm with no active bleeding and with caseous material seen coming out of it. The uterus appeared normal, and the right ovary and bilateral fallopian tubes appeared normal.

Since the woman was premenopausal, a left salpingo-oophorectomy was performed with copious and vigorous peritoneal lavage. The rest of the intra-operative period was uneventful, and abdomen was closed in layers with 2-0 Vicryl used for skin closure.

Postoperative course was uneventful, and adequate bowel rest was provided. Patient's vitals were monitored and her output charting was kept-that were all normal. There were no further fever spikes and patient was continued on intravenous high-end antibiotics. Gradual oral feeds were instituted and the patient tolerated liquids and subsequently semi-solid and solid foods.

The patient mobilized successfully and had a return of her bowel movements and appetite prior to discharge on the 7th post operative day. She followed up on an outpatient basis 6 weeks after discharge with no complaints and a wound that was well-healed.

The histopathology report obtained was confirmatory of a mature cystic teratoma with areas of skin with sebaceous glands, cartilage, and intestinal epithelium. There was no evidence of any malignancy. Cytology of the peritoneal fluid was negative for malignancy but showed fat consistent with a ruptured dermoid.

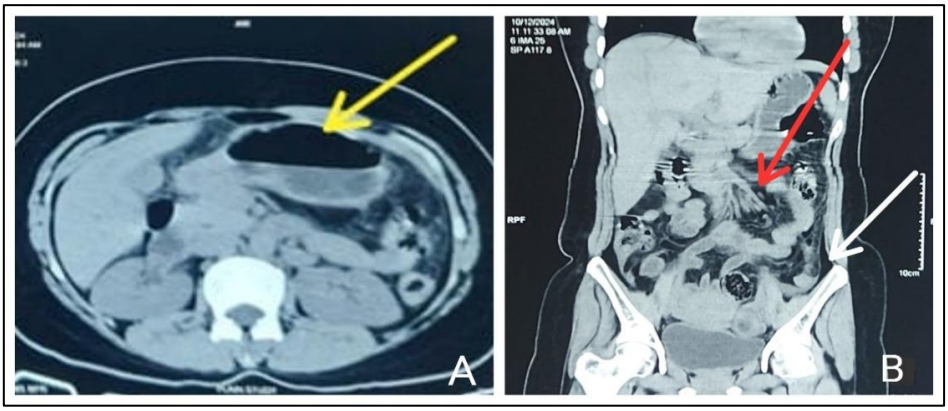

Figure 1 (A and B): A-an axial CT section at the level of the mid abdomen with dependent high attenuation fluid, filling the left paracolic gutter and non-dependent low attenuation fat seen in the anterior abdominal wall, forming a fat fluid level (yellow). This fluid was consistent with the lipid laden peritoneal fluid that was found on laparotomy. B-fat stranding (red) with fat collection intraabdominal in the dependent areas (white).

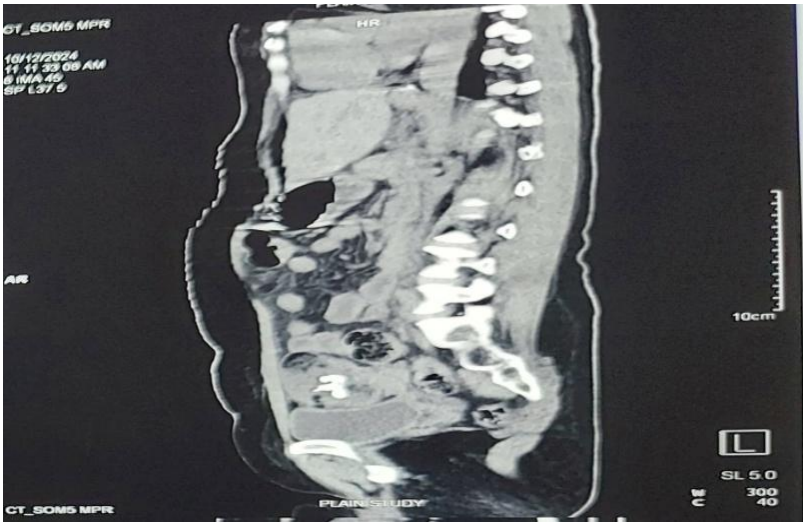

Figure 2: Sagittal median section of CT scan abdomen and pelvis shows nondependent low attenuation fat seen in the anterior abdominal wall, forming a fat fluid level.

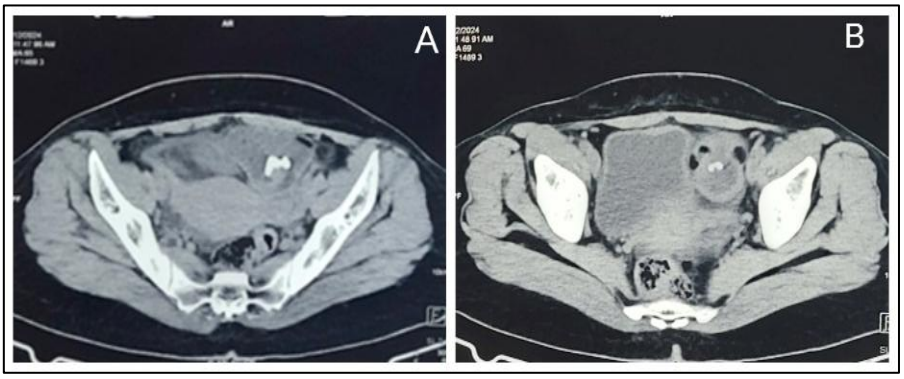

Figure 3: Axial CT section at the level of the pelvis shows a mass in the left adnexa with internal fat, fluid, and calcification, consistent with a dermoid cyst.

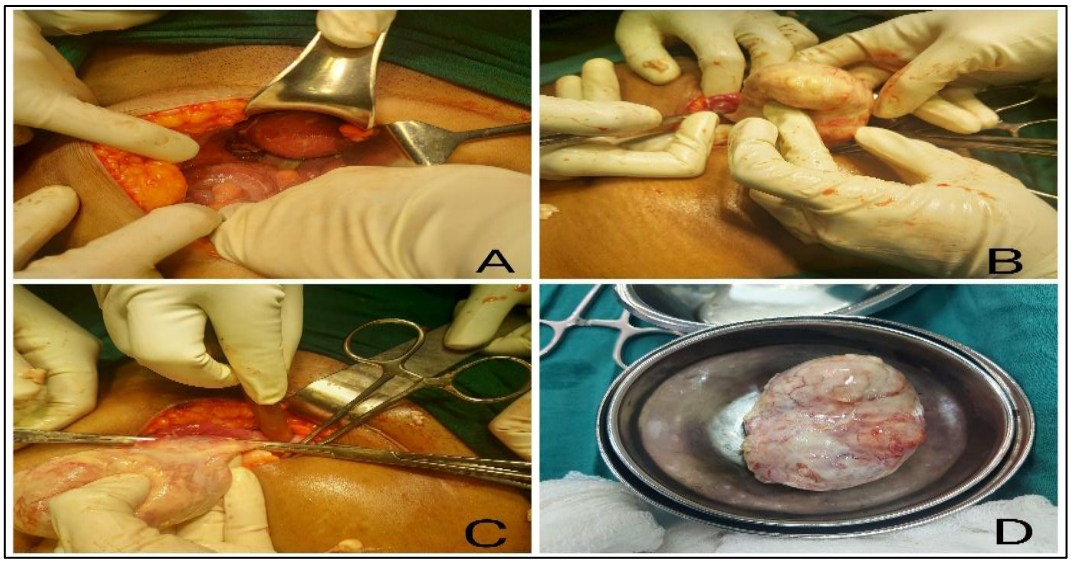

Figure 4 (A-D): A-intraperitoneal cavity coated with axial CT section at the level of the pelvis shows a mass in the left adnexa with internal fat, fluid, and calcification, consistent with a dermoid cyst. B-4×5×6.5 cm left ovarian dermoid cyst, with caseous material and fat clumps coating it. C-left salpingo-oophorectomy being performed. D-dermoid cyst after removal.

DISCUSSION

Dermoid cysts are slow growing tumors. They are usually incidentally detected in imaging, and rarely present with major complications. This contributes to delay in their diagnosis and treatment. Complications include torsion (16%), rupture (1-4%), malignant transformation (1-2%), infection (1%) and rarely autoimmune hemolytic anemia (<1%).[2,4]

Spontaneous rupture of dermoid cyst is a rare complication, because it has a thick capsule (0.3-2%). The pathophysiology of rupture is not well known, but many proposed theories have been quoted. Among them are degenerative changes in cyst wall caused by intermittent and incomplete torsion, trauma, infection and chronic pressure in pregnancy and malignant transformation. The most common causes of rupture of ovarian dermoid cyst are torsion and pregnancy, followed by trauma. Pregnancy may lead to torsion likely due to changes in the position of ovaries and increasing vascularity.[6,7]

This case report is unusual as a clear causative factor responsible for the rupture of the ovarian dermoid cyst was not determined. The size of the dermoid cyst seems to correlate to a higher risk of rupture. In a study it was shown that 80% of ovarian cysts ruptured when they were above 50 mm. The rupture rate of cysts <50 mm was 51%.[8]

Upon release of tumor contents into the peritoneal cavity, peritonitis is imminent. It can present acutely or chronic, with chronic peritonitis being more common. These patients often present with very subtle and marginal symptoms that would take strong clinical suspicion to diagnose.[5] Acute peritonitis is seen after leakage of large volume of sebaceous material due to sudden onset cyst rupture, causing acute abdominal symptoms in this patient.

On ultrasound the most common finding is a cystic mass with a dense shadowing region which is the Rokitansky Nodule or an echogenic focus of fat or thin echogenic bands due to hair within the cyst. On CT scan and MRI, the diagnosis of a dermoid cyst is simple due to sensitivity for fat. CT scan can detect calcifications while MRI can detect high TI signal within the sebaceous component. CT also has very high sensitivity and specificity to demonstrate fat attenuating lesions along the peritoneum and intraperitoneal levels and fat-fluid levels. Dermoid cysts which do not rupture can be managed conservatively as they are slow growing. Surgical management may be indicated for uncomplicated cysts that are greater than 10 cm and for post-menopausal patients as there is minimal risk of malignant transformation. The patient in this case presented with acute rupture of the cyst, that had the characteristic clinical findings of acute peritonitis, and the imaging studies supplemented our diagnosis and helped come to a decision before patient condition deteriorated. Hence use of USG and CT abdomen and pelvis were crucial to the diagnosis.

CONCLUSION

Rupture of dermoid tumors of ovaries are rare, and these are mostly asymptomatic. Pathogenesis of rupture is not established, and various theories have been proposed, including repeated torsion causing necrosis, trauma and pressure secondary to pregnancy. These patients often have no prior knowledge of having dermoid cyst, and high degree of suspicion is required. Rupture can cause acute peritonitis/chronic peritonitis and imaging modalities like USG and CECT abdomen can help us reach a diagnosis.

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