

### **Rupture of ovarian dermoid cyst with calcified spherules-a case report**

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#### **Abstract**

**Aim:** To report a case of rupture of ovarian dermoid cyst with calcified spherules.

**Case Report:** A 45 year old lady presented with acute pelvic pain where we observed the presence of calcified spherules (fat containing balls) in a ruptured cystic ovarian teratoma with the help of ultrasonography and contrast enhanced computed tomography(CECT).

**Discussion:** Spontaneous rupture is one of the complications of mature cystic teratoma of ovary. Ultrasound is a good modality to find the cyst, however CECT is more effective than ultrasonography because calcified spherules with fat and fluid, as well as the rupture site, can be seen clearly. It is necessary to identify the rupture early for preventing peritonitis and sepsis.

**Conclusion:** Although ultrasound (US) is the primary imaging modality in evaluation of acute pelvic pain in

females of reproductive age group, percentage of accuracy increases when CT scan is undertaken as an adjunct with USG.

**Keywords:** calcified spherule, dermoid cyst rupture, ruptured mature teratoma, spontaneous rupture ovarian dermoid.

#### **Introduction**

Mature cystic teratoma also called dermoid cyst is one of the most common human germ cell tumors and is usually seen in women of reproductive age group. Mature Cystic teratomas are cystic tumors composed of derivations from at least two of the three germ cell layers (ectoderm, mesoderm and endoderm).<sup>1</sup> The most frequent germ cell neoplasm and, in some cases, the most common ovarian tumour removed during surgery is mature cystic teratoma.<sup>7,6</sup> It is the most common ovarian mass in children under the age of eight. After the first meiotic division, mature cystic teratomas

emerge from a single germ cell.<sup>9</sup> The majority of mature cystic teratomas have no symptoms. Only a small percentage of people have abdominal pain or other nonspecific symptoms.<sup>10</sup> Mature cystic teratomas grow slowly, at an average of 1.8 mm each year, prompting some researchers to recommend nonsurgical treatment for tumors smaller than 6 cm.<sup>11</sup> Simple cystectomy can be used to treat mature cystic teratomas that need to be removed. In roughly 10% of cases, the tumours are bilateral.<sup>12</sup> Mature cystic teratomas have a distinct gross pathologic appearance. In 88 percent of cases, the tumours are unilocular and filled with sebaceous material, which is liquid at body temperature and semisolid at ambient temperature.<sup>12</sup> The cyst's wall is lined with squamous epithelium, and the exterior surface is covered by compressed, typically hyalinized ovarian stroma.<sup>13,14</sup> Within the wall, you'll find hair follicles, skin glands, muscle, and other tissues. A elevated protuberance known as the Rokitansky nodule generally projects into the cyst cavity. This protuberance is where the majority of the hair grows. When there is bone or teeth present, they are usually seen within this nodule.<sup>15</sup> The presence of ectodermal tissue (skin derivatives and neural tissue) is unavoidable.<sup>12,13,15</sup> Endodermal tissue (e.g., gastrointestinal and bronchial epithelium, thyroid tissue) is observed in the majority of instances, and mesodermal tissue (fat, bone, cartilage, muscle) is found in over 90% of instances.<sup>12</sup> In 67 percent–75 percent of instances, adipose tissue is present, while teeth are detected in 31%.<sup>12,13,15</sup> Ovarian dermoid with intracystic floating fat balls (spherules) is a rare occurrence.<sup>2</sup> The complications of an ovarian teratoma are mainly torsion (16% of ovarian teratomas), rupture (1%-4%), malignant transformation (1%-2%), infection (1%) and autoimmune hemolytic anemia (<1%).<sup>3</sup>

On the basis of sonography, CT, or magnetic resonance imaging, a radiologic diagnosis of cystic teratoma can be achieved quickly. The variety and preponderance of internal contents apparently account for the spectrum of sonographic appearances because an ovarian tumor may contain a high number of identifiable tissues, including matted hair, well-formed teeth, and semisolid sebaceous material. A teratoma might look as a primarily cystic, solid, or complicated tumor on sonography.<sup>15,16,17</sup> Certain characteristics, however, are regarded specific. An echogenic mural nodule (the "dermoid plug" or "dermoid nipple"), a fat-fluid or hair-fluid level, and distal acoustic shadowing created by a highly echogenic mixture of matted hair and sebum, referred to as the "tip of the iceberg" sign, are among them.<sup>16,18,19,20</sup> The "dermoid mesh," or many linear hyperechoic interfaces generated by the floating hair fibers within the cyst, is another characteristic feature.<sup>21</sup>

### Case report

A 45-year-old female patient presented with complaints of fever, pain abdomen and constipation since 4 days associated with 2 months of amenorrhea. She had no relevant past medical or surgical history.

Plain abdominal radiograph revealed few dilated bowel loops. Ultrasonography (USG) showed mild collection with multiple internal echoes in right iliac fossa and right ovary is not separately visualized. So differentials of hollow viscus perforation, appendiceal perforation, ruptured right ovarian haemorrhagic cyst and ruptured ectopic pregnancy were considered.

Contrast Enhanced Computed Tomography (CECT) of abdomen demonstrated a 4.3x6.8x9.3cm sized right adnexal cystic lesion containing fat, foci of calcifications, multiple small round balls (Spherules) with peripheral rim of calcification within, associated with a defect in the enhancing wall causing

peritoneal spillage of its contents and mild ascites. The main cause of rupture, like in this case, is idiopathic.

So a diagnosis of ruptured right ovarian dermoid cyst was made. Patient was operated and histopathology confirmed the diagnosis of mature cystic teratoma containing hair, teeth and multiple spherules within, which are yellow-white sebaceous balls. An intense foreign-body histiocytic reaction, including giant cells and hair shaft, was seen on the serosal surface of the bilateral ovaries and tubes, consistent with a ruptured dermoid cyst. In histopathology of the dermoid cyst, there was no sign of malignancy. The cytology of the abdomen fluid revealed no malignancy and was consistent with the contents of a ruptured dermoid cyst.



Fig.1: Ultrasonography (USG) abdomen showing mild ascites with multiple internal echoes in right adnexal region.

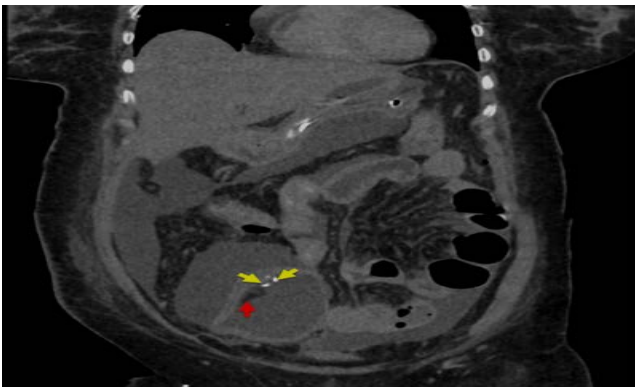


Fig.2: Coronal CECT image showing cyst with fat (red arrow) and calcifications (yellow arrows) with fluid inside.

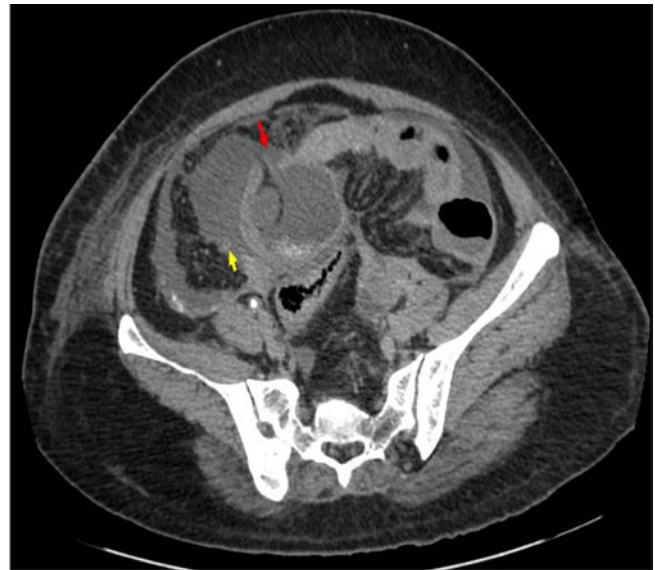


Fig.3: Axial CECT image showing enhancing thick walled cystic lesion with a wall defect (red arrow) and peritoneal spillage of contents (yellow arrow).



Fig.4: Axial CECT image showing fluid collection with calcified spherules (red arrow) in anterior and posterior cul de sac.



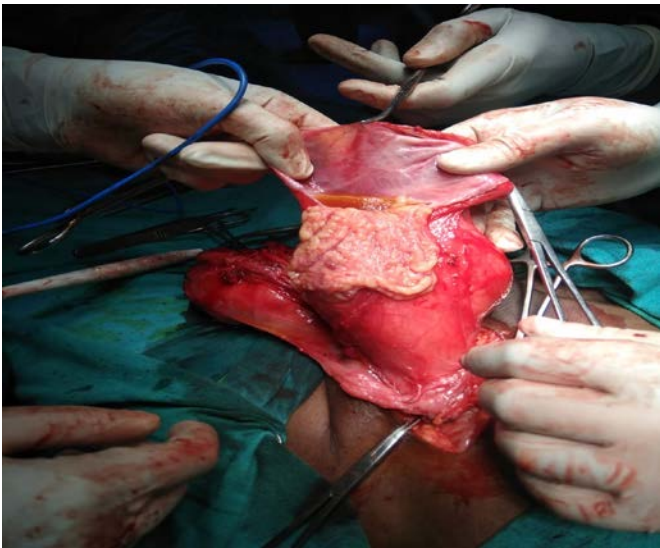


Fig.5: Image showing intra-operative ruptured dermoid cyst.



Fig.6: Resected specimen(yellow arrow) with spherules (white arrow).

### Discussion

The word teratoma is derived from the Greek word teraton, meaning monster. Most mature cystic teratomas can be diagnosed in ultrasonography (USG), but may have a variety of appearances, characterized by echogenic sebaceous material and calcification.

In computed tomography (CT), presence of fat and calcification within a cyst is diagnostic.<sup>3</sup>In magnetic resonance imaging (MRI), the sebaceous component is

specifically identified with fat-saturation techniques.<sup>3</sup> Even though MRI could delineate the fat component better; its availability, cost, scan time and detection of calcifications are the limiting factors. Whereas in Contrast Enhanced Computed Tomography (CECT) with the help of Multiplanar reformatted (MPR) images and CT HU values we were able to detect fat, calcific foci and multiple calcified balls (Spherules) along with site of rupture.

Unusual striking finding of mature cystic teratomas are multiple mobile spherules or globules which resemble daughter cysts of cystic hydatid disease.<sup>4,5</sup> Spherules are rarely found in dermoid cysts, but when found it has narrow differentials (like dermoid cyst and daughter cysts of hydatid). But here spherules were seen with fat (CT HU: -30 to -70)and calcification (CT HU: +1000), so the diagnosis points towards ovarian cystic teratoma. The spherules with peripheral rim of calcification is new finding. The reasons for the presence of calcified spherules might be due to globule formation from tiny, floating tissue nuclei that accumulate cell debris, sebum and hairs around them or from floating pluripotent cells that act as a core and then differentiate into outer fat tissue and hairs. And this spherules formation must be happening over a long period of time.

### Conclusion

Although ultrasound (US) is the primary imaging modality in evaluation of acute pelvic pain in females of reproductive age group, percentage of accuracy increases when CT scan is undertaken as an adjunct with USG. Contrast enhanced computed tomography is the modality of choice for demonstration of inflammatory wall of dermoid cyst, spherules, fat and calcification which is invariably a limitation with ultrasonography alone. A ruptured dermoid cyst with

spherules and a calcified peripheral border is an unusual presentation that could be the outcome of a chronic disease.

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