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Unusual Feature of Mature Cystic Teratoma: Multiple Intra-cystic Spherical Structures: A Case report

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ABSTRACT

Ovarian mature cystic teratomas (OMCTs) due to their heterogeneous histologic entity, have a wide spectrum of radiologic features. A type of floating spherical globule that has been called “Sack of marble” or "Coins-in-sack," but without a fat or calcification component that results in misdiagnosis on computed tomography (CT), is a rare finding. The patient was a 35-year-old healthy woman with abdominal pain and sonographic findings based on OMCT with the Coins-in-sack sign, whereas the CT manifestation was a unilocular huge cyst suggesting an adnexal cystadenoma. She had a final diagnosis of the Coins-in-sack variant of OMCT but with keratin balls, not common fat balls. Understanding the unconventional radiologic and histologic manifestations of OMCTs, is necessary to make an accurate diagnosis.

Keywords: Ovarian Mature Cystic Teratoma (OMCT), Floating balls, Coins-in-sack, Computed Tomography (CT)

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Introduction

Ovarian mature cystic teratoma (OMCT) is the most common benign ovarian germ cell neoplasm. It is a kind of predominantly cystic tumor that is composed of mature tissue of ectodermal, mesodermal and endodermal derivatives that result in characteristic gross appearance and histologic gross appearance and histologic with various radiologic features due to heterogeneous entity **(1, 2)**.

Although different imaging manifestations of OMCTs, are well - described in the literature, the less common variants of this mass should be considered more, until the rare, specific radiologic features of OMCTs, are not misdiagnosed with the neoplasm. We describe a case of OMCT with an unusual imaging feature of multiple intracystic floating spherical structures.

Case Presentation

A 35-year-old healthy woman with gravida 3 para 3 was referred to our oncology clinic due to recent abdominal pain and mass. On pelvic examination, there is a huge mobile mass in the midline of the pelvis that is extended up to the umbilical part. Pelvic transvaginal ultrasound revealed a huge 15×20 cm in mean diameter, complex cystic mass with a thick wall, including numerous mobile spherical echogenic intra-cystic structures without vascularization on color Doppler, that made a suggestion of a mature pelvic teratoma with the radiologic feature of the "Coins-in-sack or “Sack of marble” sign (Figure 1).

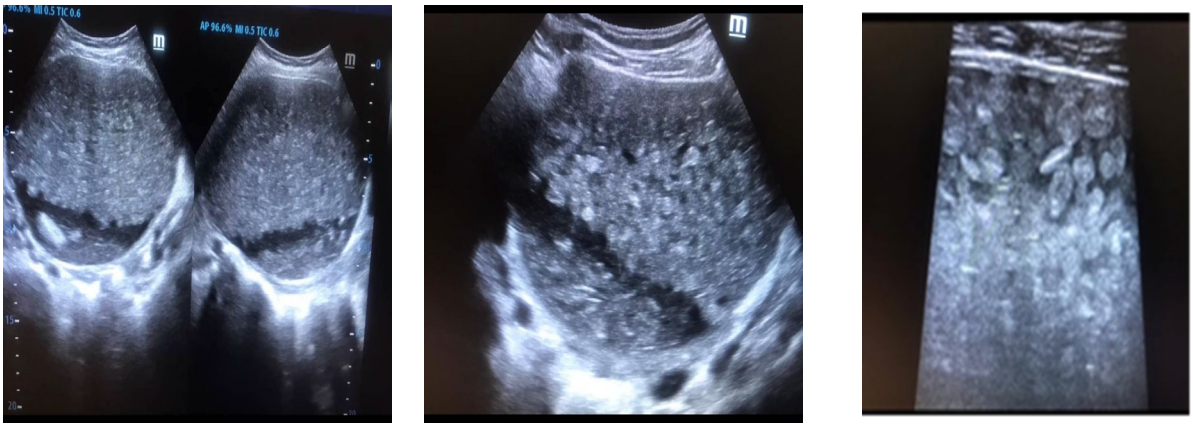


Figure 1. Pelvic ultrasound shows, floating intra cystic echogenic balls with flat-fluid level and scanty echogenic linear structures.

On computed tomography (CT) without contrast, it is reported large 15×20 cm unilocular cystic mass in midline of pelvic, pushing to surrounding tissues without calcification and fat density, suggested adnexal cystadenoma (Figure 2).

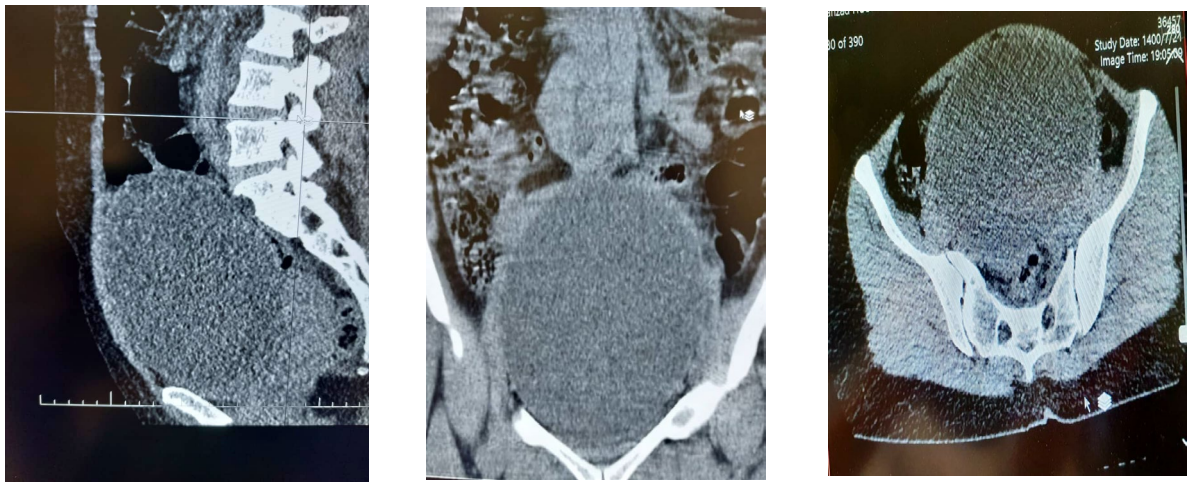


Figure 2. CT without contrast: huge unilocular cystic mass without calcification and fat density.

Serum tumor markers were, CA-125:20 u/ml and CA-19-9: 2 u/ml. The patient underwent laparotomy. Intraoperatively right salpingo- oophorectomy was carried out due to 15×20 cm unilocular cystic mass without adhesion or spillage. A surgical specimen cut-section showed numerous 2-10 mm brown pasty globules floating in a claylike fluid with a small amount of heir (Figure 3).

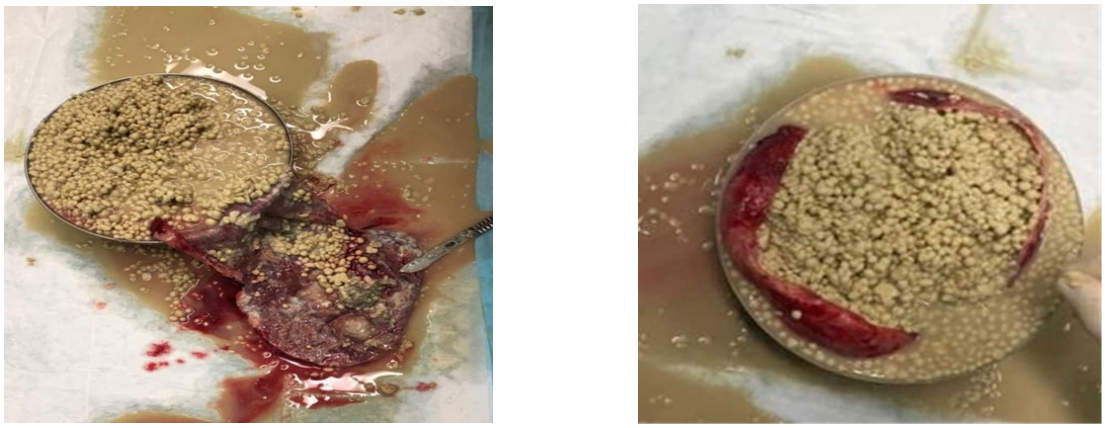


Figure 3. Surgical specimen cut-section with numerous pasty globules and small amount of hair.

The patient had an uneventful postoperative recovery. Permanent pathology was reported, 15×15cm mature cystic teratoma with 0.8cm wall thickness, numerous colored solid globules measuring 0.2 to 1cm in diameter, floating in turbid light brown colored fluid made of keratin material and a raised protuberance in the cyst wall (Rokitansky nodule) composed of hair tuff measuring 3 cm in the greatest diameter.

Discussion

Ovarian mature cystic teratomas (OMCTs), because of their various compositions due to pluripotential germ cell origin, can have a wide spectrum of radiologic imaging features. In gross appearance, it is straightforward to diagnose OMCTs. Frequently, the cut section of OMCTs is unilocular cyst filled with sebaceous material, because of the wall that is lined by the squamous epithelium. It is also called a dermoid cyst, due to the presence of most skin elements, such as hair and keratin **(3-5)**.

Fat is present in more than 93% of OMCTs and teeth or other calcification occurs in 56% of cases **(2, 4)**. Due to the variety of appearance and histologic types in this kind of tumor, a wide spectrum of radiologic imaging features has been reported. Most OMCTs can be diagnosed by ultrasonography, but unusual types lead to misdiagnosis. Computed tomography (CT) and magnetic resonance (MR) imaging, made the diagnosis of OMCTs due to the more sensitive nature of those modalities for fat calcification **(6, 7)**.

One of the bizarre radiologic features of OMCTs is intracystic floating balls, which have been called coins-in-sack or the "sack of marble" sign. Firstly, it had been reported on the basis of pathologic findings **(8)**, whereas the radiologic report of this variant was done subsequently **(9)**.

Pathologically, these floating balls were formed by the aggregation of variable sebaceous material, debris, keratin, hair, hemosiderin and fat in enough space of large cyst **(6, 10, 11)**.

The different contents and density of these globules, made them gravity-dependent or gravity-independent in large cyst **(10)**.

It is clear that, being essential, enough space for ball formation needs to increase with age due to the slow growth of OMCTs at an average rate of 1.8 mm each year **(2, 10)**.

Floating globules that have been called fat balls in some studies, don't always consist of fatty components **(6, 11, 12)**.

Sometimes, due to the lack of fat components in the floating balls, and being close to the liquid density of these spherical structures, this kind of floating balls or coins- in-sack sign, on CT modality, may be not revealed but with attention to showing different signals for different components in MRI, it can be determined that this unusual type of OMCTs with an absence or scary amount of fat in the globules **(13)**.

In our case, the feature of coins-in-sacks was first reported on sonography.

MCTs are usually detected easily on sonography, and their specificity is 99% **(2)**, but the variety of OMCTs composition results in limitless sonographic appearances. Therefore, the presentation of uncommon case reports is associated with an increased accuracy of diagnosis. Despite some studies based on the large size and diameter of these floating balls, this case included small balls 0.5 to o.8 cm in diameter. According to previous studies based on floating ball formation, a large cyst that consequently happened in older patients, whereas our patients were not much older, but the size of the cyst was huge.

These balls could be misdiagnosed with papillary projections or nodular growth, particularly in limited amounts, of malignant masses on sonography, but similar to our case, color flow mapping showed no vascularization in these balls. In our case, on CT imaging, incorrectly, it was suggested that there was a probable huge adnexal cystadenoma due to the absence of fat or calcification content.

Pathologically, these globules were made of keratin materials with no fat component, therefore, the density of this content is close to the liquid density occupying the cavity of this large cyst, so it is difficult to distinguish of these kinds of unusual features of OMCTs on CT examination. Because of these pitfalls of CT, it is preferred in questionable sonographic cases or for confirming sonographic suggestions initially.

We perform MRI examinations because we have different signals for different histologic components **(13)**.

Conclusion

OMCTs due to their heterogeneous histologic component, have various and challenging radiologic features, sometimes with unconventional manifestations that are not presented in the fat or calcification component, so, physicians should be aware of their distinct and uncommon appearances in different imaging modalities.

Therefore, we should elucidate uncommon findings, so that they can be helpful in training, making accurate diagnoses, and expanding our knowledge.

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Informed Consent

Written informed consent was obtained from the patient.

Ethics Committee Approval

This study was approved by the Ethics Committee of Urmia University Medical Sciences.

Conflict of Interest

There is no conflict of interest.

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