

# Floating ball appearance in ovarian cystic teratoma

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## ABSTRACT

The presence of floating fat balls or globules in an ovarian cystic teratoma is an unusual finding. Herein, we present ultrasonographic and tomographic findings of a rarely reported case of cystic teratoma with a floating fat ball.

**Key words:** • teratoma, cystic • mobile fat ball  
• ultrasonography • computed tomography

Ovarian cystic teratomas or dermoid cysts are primarily cystic lesions that include a variable amount of fat tissue. Its imaging properties vary between a hyperechogenic view with posterior acoustic shadowing and a lesion including diffuse or local shiny echoes, or a fluid-fluid/fat-fluid level (1, 2). In this report, a case of ovarian cystic teratoma with a floating ball appearance that is rarely reported, but specific for the lesion is presented.

## Case report

A 28-year-old woman presented to the urology outpatient clinic with a complaint of left flank pain. Urinary system ultrasonography was performed with the pre-diagnosis of acute renal colic. In ultrasonography, a 1 cm stone leading to grade I ectasia of the collecting system was detected in the proximal part of the left ureter. Additionally, a 9 cm heterogeneous mass lesion with internal echoes and a crescent-shaped hyperechogenic area leading to posterior acoustic shadowing was identified at the left ovary (Figure 1). The right ovary was normal. After diagnosis of urolithiasis and dermoid tumor, computed tomography (CT) examination was advised for detailed study of the pelvic mass. Following treatment of urolithiasis, contrast-enhanced pelvic CT examination was performed electively. On CT, a cystic mass with a fat-fluid level and a 4 cm floating ball appearance inside, originating from the left ovary and extending superiorly toward the prevertebral area with dimensions exactly as defined previously by ultrasonography was observed (Figure 2). In order to observe the mobility status of the floating ball, an additional 3 images of 1 cm thickness were obtained at the left lateral decubitus position (Figure 3). Density measurements revealed that the floating ball mostly included fat. With these findings, the lesion was diagnosed as cystic teratoma. Histopathological examination of this lesion after surgical excision, performed electively, confirmed the diagnosis of cystic teratoma.

## Discussion

Cystic teratomas are congenital tumors that include the remnants of all 3 germ layers. Teratomas constitute 10%-15% of ovarian tumors. These tumors are usually detected in women of reproductive age and are rarely seen before puberty. Their growth stops after menopause. Cystic teratomas are also called dermoid cysts. They are usually unilateral, unilocular, smooth-surfaced lesions that can grow up to 15 cm. They may include sebaceous material, hair, bone, calcification, thyroid tissue, and bronchial mucous membranes. Cystic dominant lesions may be seen as complex masses. Intracystic fat tissue may be visualized as hyperechogenic and solid when epithelial debris and hair form conglomerates (1, 2).

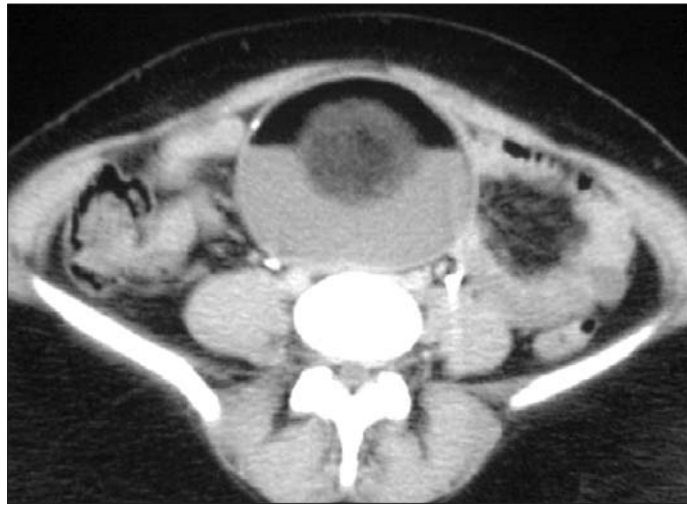
In their large series reviewing 370 cases of benign ovarian teratoma, Kim et al. reported that a fluid-fluid level within a cystic ovarian tu-

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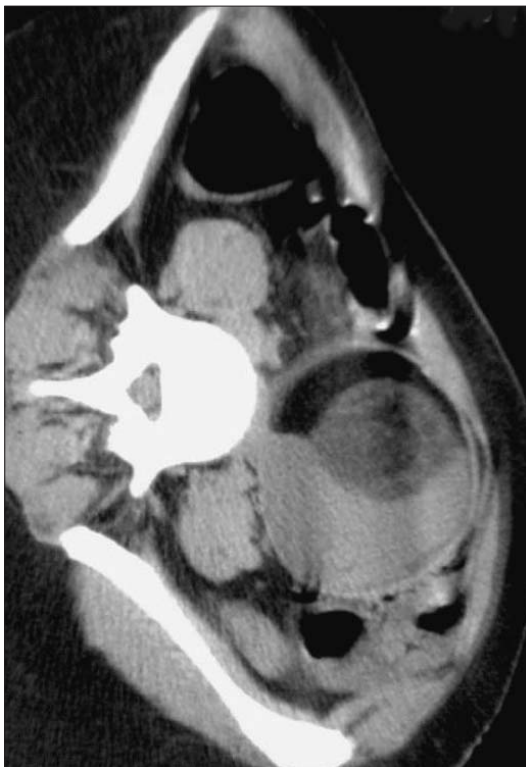
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**Figure 1.** A cystic lesion including internal echoes with a thin, smooth wall and a crescent-shaped hyperechogenic area with strong posterior acoustic shadowing within the lesion is seen on ultrasonographic image.



**Figure 2.** A fat-fluid level and floating fat ball appearance within the thin-walled lesion is seen on spiral CT image.



**Figure 3.** Position dependent movement of the floating fat ball is seen on spiral CT image obtained at the left lateral decubitus position.

mor may strongly suggest cystic teratoma, but it is pathognomonic for a cystic teratoma when there is a floating nodule observed within the lesion in any of the imaging modalities such as ultrasonography, CT, or magnetic resonance imaging (MRI) (1). In our case, as a floating ball within the lesion was observed, a diagnosis of cystic teratoma was made, and surgery con-

firmed the diagnosis. To the best of our knowledge, even though cystic ovarian teratoma cases with multiple floating ball appearances were reported (3-5), a floating fat ball appearance coexisting with fat-fluid level has not been reported.

Although it is mentioned that a fluid-fluid level within an ovarian mass may strongly suggest cystic teratoma,

other cystic ovarian tumors including necrotic material or blood, endometrioma, or hemorrhagic ovarian cysts may also include blood elements at varying degeneration stages, and they may show a fluid-fluid level; thus, a fluid-fluid level may not always be a sufficient finding for the diagnosis of cystic ovarian teratoma (1, 6, 7). Nonetheless, it has been reported that fat-fluid level or floating nodule appearance are not seen in non-teratomatous masses (1).

Ovarian cystic teratomas are classically categorized into 3 types according to their configuration and components. In the first type, layering secondary to floating debris within the tumor is seen. The second type includes nodular or vegetative mural protrusions. The third type shows a fat-fluid level (7, 8). Apart from the classic appearance, there were both fat-fluid level and floating ball appearance in our case.

Floating nodules within the cystic ovarian teratomas include fat, hair, and soft tissue. Floating nodules consisting of a mixture of fat and hair are seen as hyperechoic with ultrasonography and produce intense posterior acoustic shadowing. In our case, the floating nodule had the same property. An anechoic cystic component represents pure sebum that is liquid at normal body temperature (3).

Though it is reported that ultrasonography examination is enough for demonstrating a floating fat ball (3, 4), US may not be sufficient for accurate

diagnosis when a floating ball produces strong acoustic shadowing, as it did in our case. In this situation, CT may be more beneficial than ultrasonography for the evaluation of the inner texture of the lesion. Moreover, CT examination at the decubitus position may be helpful in showing mobility of the fat ball.

In a patient with a cystic ovarian mass, fat-fluid level, fluid-fluid level with the presence of a fatty component and a floating nodule appearance on CT, is accepted pathognomonic for cystic teratoma (1, 9). MRI, with a high degree of soft tissue resolution and multiplanar imaging properties, has become the imaging modality of choice for examining the pelvis, especially in women of reproductive age, in order to avoid ionizing radiation. Particularly, T1 weighted MRI gives diagnostic information for lesions. On T1 weighted MRI, most cystic teratomas show hyperintensity since they include

high fat tissue content. Calcifications, bone, hair, and fibrous tissue that are usually seen in teratomas are observed as hypointense (9).

As a result, extraordinary sonographic appearances of a cystic teratoma may be challenging for diagnosis. In a patient with an ovarian mass, a fat-fluid level or a fluid-fluid level in the presence of a fatty component, and floating ball appearances on CT or MRI may be diagnostic of a cystic teratoma. Additionally, with the help of a few CT slices acquired in lateral decubitus position, the mobility of floating ball can be shown to confirm the diagnosis.

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