Cystic struma ovarii: Multidetector CT findings

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Patient: 67 years, female

Clinical History:

Struma ovarii is an uncommon ovarian tumor containing thyroid tissue. This neoplasm may be almost entirely cystic, without any solid components. We present a case of cystic struma ovarii, evaluated by both multidetector CT (MDCT) and MR imaging and discuss the differential diagnosis.

Imaging Findings:

A 67-year old woman was referred to the Radiology department for further evaluation of a multicystic pelvic mass, discovered incidentally during her routine annual sonographic examination. Laboratory data were normal and the serum level of CA-125 was within the normal range.

Multidetector CT examination was performed on a 16-row CT scanner. A multicystic left pelvic mass, with hyperdense parts (of 40-50 HU density) was detected (Fig. 1). The dimensions of the mass were 4 X 4 X 4.5 cm. The lesion was sharply demarcated, with thick septations (septal thickness greater than 3 mm). Nodular components, of 80-90 HU density, interpreted as enhancing elements were also detected within the mass (Fig. 1b). No ascites or other signs of invasive disease were seen. Nevertheless, the diagnosis of adnexal malignancy based on the CT findings could not be excluded.

MR imaging of the pelvis was followed and confirmed the presence of a multilocular left adnexal cystic tumor (Fig. 2), with parts of slightly higher signal intensity than muscle on T1-weighted images. The nodular components were of very low signal intensity (similar to flow voids) on T2-weighted images (Fig. 2). Based on the MR findings, a cystic struma ovarii was included in the differential diagnosis.

The patient underwent a total abdominal hysterectomy and left salpingo-oophorectomy and the diagnosis of cystic struma ovarii was made on histopathology. The patient is now well, with no signs of recurrence or metastases, on follow-up CT examination, 12 months after surgery.

Discussion:

Struma ovarii accounts for 0.3-1% of all ovarian tumors and 3% of mature cystic teratomas [1-6]. Symptoms or signs of hyperthyroidism accompany these tumors in 5% of cases [5, 7]. Most published reports describe the MR characteristics of struma ovarii, as a multilocusated cystic mass, with solid parts and low signal intensity areas, both on T1 and T2-weighted images, due to the presence of viscid gelatinous material [3-5, 7, 8].

Struma ovarii may appear as partly solid-cystic mass or as predominantly cystic tumor, closely resembling ovarian cancer [6, 7, 9, 10]. Matsuki et al described the MR features in three cases of cystic struma ovarii, as multilocuscular cystic masses with variable signal intensity of the cystic components [7]. The presence of areas of very low signal intensity on T2-weighted images, due to viscous colloid material was considered as suggestive for the presence of struma ovarii [7]. Susumu et al confirmed the same MR characteristics as indicative for this rare tumor [9]. The same
group of investigators described one case of a thin-walled unilocular cystic struma ovarii, on CT examination [9]. In our case, contrast-material enhanced CT demonstrated a multicystic ovarian mass, with thickened septa and hyperdense parts, with contents of higher density than that of water. The coexistence of ‘enhancing’ elements within the mass (of 80-90 HU density) suggested the diagnosis of ovarian malignancy in our case. Histologically, the tumor was composed of variable-sized cysts, filled with colloid-like material, which accounted for the hyperdensity or signal hyperintensity on T1-weighted images of the cystic parts, on CT and MR imaging examination, respectively. The presence of very viscid gelatinous material within the mass, although misinterpreted as enhancing elements on MDCT, demonstrated signal voids on MR imaging, suggesting the diagnosis of a cystic struma ovarii.

The presence of enhancing solid elements within an adnexal mass might be a simple and specific indicator for the presence of malignancy on imaging [11, 12]. Differential diagnosis in this case included ovarian malignancy, endometriosis, tuboovarian abscess, and mature cystic teratoma without fatty tissue. Mucinous ovarian tumors are typically multilocular, with numerous cysts, demonstrating tumor locules of density higher than that of water on CT examination, as in this case [11, 12]. Therefore, based on the MDCT findings the diagnosis of mucinous cystadenocarcinoma could not be excluded on this patient. The CT appearances of endometriomas, on the other hand, have been reported as non-specific [13, 14], although the incidence of endometriosis in postmenopausal women is low [15]. The presence of a multiloculated cystic mass with thick and irregular walls and septa is also the commonest appearance of pelvic inflammatory disease [16, 17]. Therefore, based on the multidetector CT features, the differential diagnosis was difficult in our patient, the mass closely mimicking ovarian cancer. MR imaging, on the other hand, was more specific in the preoperative characterization of the nature of this lesion. The presence of viscid colloid material within the mass, demonstrating signal void on MR imaging, suggesting the diagnosis of a cystic struma ovarii.

**Differential Diagnosis List:** Cystic struma ovarii

**Final Diagnosis:** Cystic struma ovarii

**References:**


Figure 1

Description: Figure 1. (a) Transverse and (b) sagittal multiplanar reformatted images show a multilocular cystic left adnexal mass, in close proximity to the uterus. The presence of nodular enhancing elements (arrows) within the tumor was indicative of malignancy. Origin:
Figure 2 

Description: Figure 2. (a) Transverse and (b) sagittal fast-spin echo T2-weighted images (TR/TE, 4000/120) demonstrate a multicystic adnexal lesion. Areas of very low signal intensity (arrows) within the mass, corresponding to very viscous gelatinous material on pathology, raised the possibility of a cystic struma ovarii in the differential diagnosis. Origin:
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