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Case Report

Atypical dermoid cyst of the ovary during pregnancy: A multi-modality diagnostic approach

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ABSTRACT

We report a case of a sixth-month-pregnant 37-year-old woman with abdominal pain with the presence of a dermoid cyst of the left ovary. The diagnostic work-up required a multi-modality imaging approach. In particular, US and MR examinations were initially performed but resulted with an inconclusive outcome of a final diagnosis. Hence, a CT scan was successively used to formulate lesion characterization. Thus, integrated imaging approach would be recommended.

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Case report

A 37-years-old woman at the sixth month of gestation was admitted to our institution to evaluate an epigastric pain radiating to the left region of the abdomen associated to constipation. Initially, an ultrasound (US) of the abdomen was performed, revealing the presence of a heterogeneous hypoechoic mass located in the left flank with no significant vascular signal on color-Doppler (Fig. 1). Since this finding was compatible with a fecaloma, an enema was performed but the clinical condition of the patient worsened. Subsequently, an abdominal US examination was repeated; a bowel dilation of about 8 × 5 mm with a “target” sign surrounded by a

little amount of fluid was detected (Fig. 2). Two diagnostic hypotheses were then formulated such as an invagination of the splenic flexure or a fecaloma occluding the descending colon; thus, a second enema was performed but patient's clinical status did not improve.

For further investigation, a magnetic resonance imaging (MRI) examination of the abdomen was performed using a 1.5 T MRI scanner (Philips Medical Systems); the scan protocol included T2-weighted sequences with and without fat-suppression and T1-weighted in-out phase sequences. Adjacent to the descending colon, a lobulated mass of about 5 cm was found, seemingly compressing the bowel lumen. The lesion showed an intermediate heterogeneous signal on both T1-weighted and T2-weighted sequences, with high

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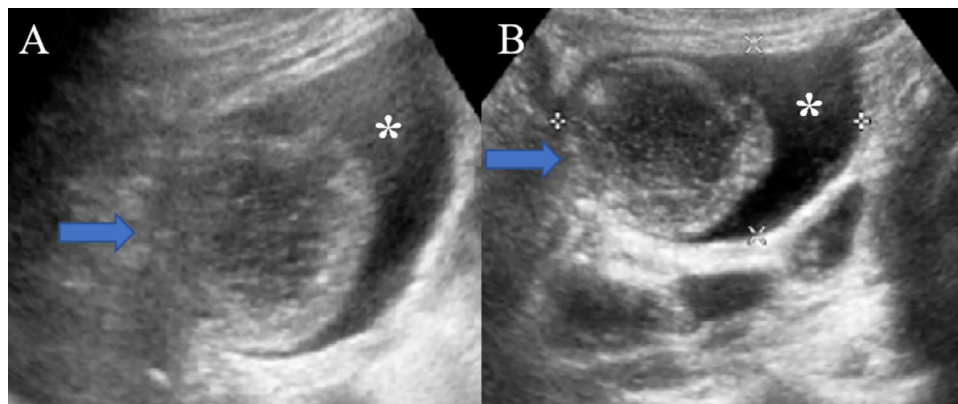


Fig. 1 – US images show a mass (arrow in A and B) surrounded by fluid (* in A and B), in the left region of the abdomen.

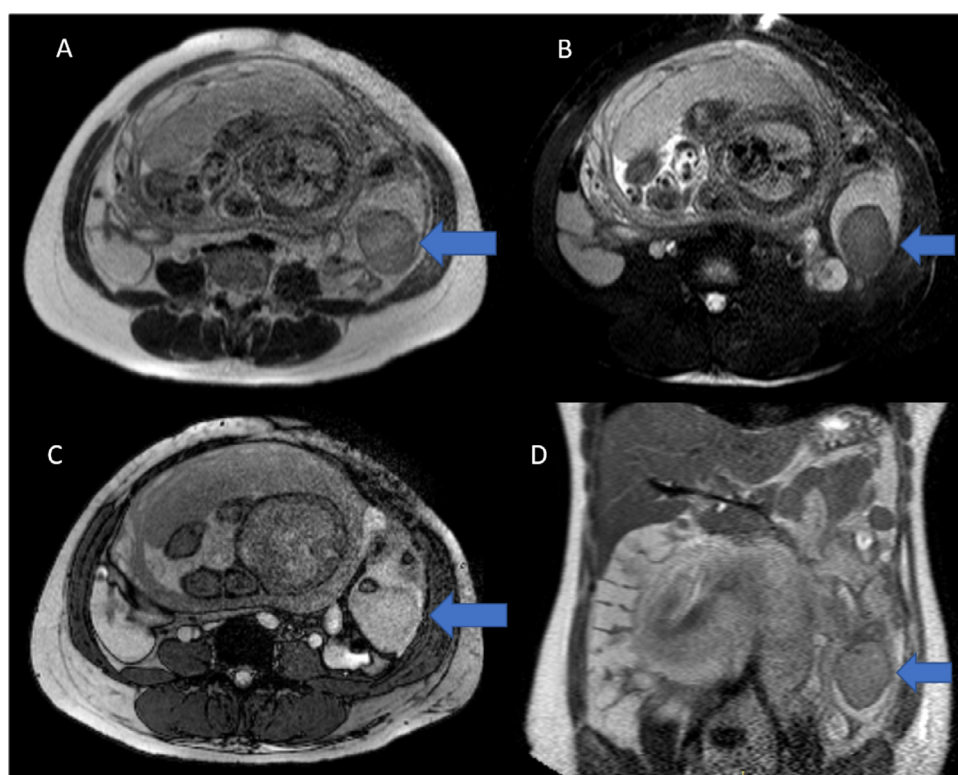


Fig. 2 – Axial T2-weighted half-Fourier-acquired single-shot turbo spin echo (HASTE) (A), axial T2-weighted HASTE with fat-suppression (B), axial balanced turbo field echo (BTFE) (C) and coronal T2-weighted HASTE (D) images. A lobulated mass of about 5 cm is depicted (arrow in A-D) surrounded by fluid, with intermediate heterogeneous signal on T2-weighted HASTE images (A, B, D), and high signal intensity on BTFE image (C).

signal intensity on balanced turbo-field-echo images and was surrounded by fluid, which appeared hyperintense on T2-weighted images; in particular, anatomic landmarks of the lesion with the surrounding organs, including the descending colon, were not clearly assessable due to the poor quality of the MR images. MR scan also revealed a hiatal hernia which could explain the epigastric pain; even though the clinical presentation was compatible with a colonic occlusion, there were no clear signs of bowel obstruction on MRI images (such as bowel distension) and the patient underwent a colonoscopy

examination that resulted negative. Epigastric pain worsened as it extended to the lower abdomen and constipation did not improve, therefore a computed tomography (CT) scan was performed; in particular, beforehand all possible risks were accurately explained to the patient; a low-dose abdominal CT protocol was applied to reduce the possible radiation-induced damage. The CT images clearly showed a mass in the left adnexal region of about $8 \times 6 \times 9$ cm characterized by a mixed structure with fluid, fat and calcium components (Fig. 3); these CT findings were indicative of a dermoid cyst causing a mass

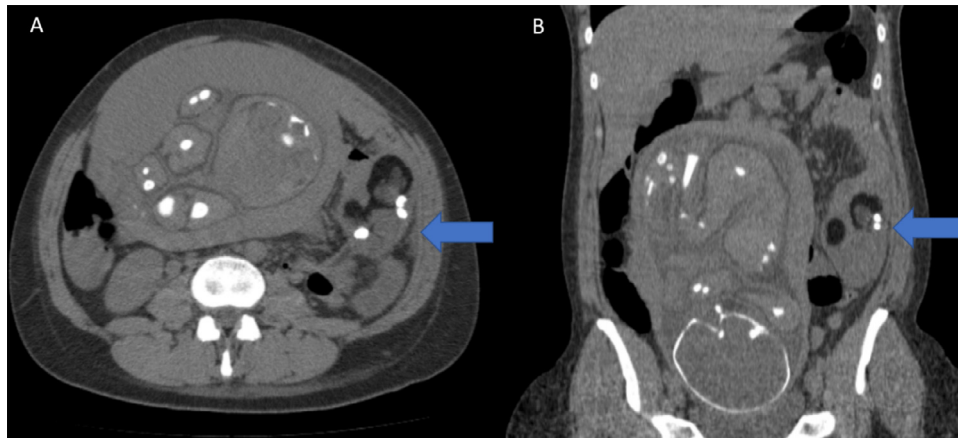


Fig. 3 – Unenhanced axial CT (A) and reformatted coronal unenhanced CT (B) images show a multilobulated mass (arrow in A and B) containing fluid, fat and calcification in the left region of the abdomen.

effect on the nearby descending colon. The patient underwent a cesarean section and concurrent excision of the mass; the diagnosis of a dermoid cyst was confirmed at histology.

Discussion

Abdominal pain is a very common symptom during pregnancy. Its most frequent causes in this setting are acute appendicitis, hydronephrosis, thrombosis, and ovarian cyst [1,2]. The dermoid cyst is a neoplasia derived from all the 3 types of embryonal tissues. In particular, the 95% of such cases are represented by mature forms [3]. Of note, this type of lesion is more frequent during pregnancy because of the higher levels of estrogens [4]. When ovarian, it usually causes pelvic pain, whereas abdominal pain is less common [5].

On imaging, teratoma shows heterogeneous features; on US, the lesion appears as a cyst with a hyper-echoic protuberance called Rokitansky nodule, containing hair, teeth, and fluid. On CT, teratoma appears as a multiloculated cystic-like mass with thin walls and a mixed content made of fluid, fat and calcified elements, as also occurred in our case. On MRI, the lesion shows increased signal on T1- and T2-weighted sequences because of the fat content; in particular, the acquisition of fat-suppression sequences allows to discriminate fat from blood components; in addition, T1- weighted in- and out-of-phase images are also useful to detect the presence of intracellular fat [6,7].

In patients with abdominal pain during pregnancy, imaging diagnostic evaluation has an important role, though, it is important to assess the biological risk for the fetus. Therefore, US and MRI are usually preferred in order to avoid radiation exposure. Some peculiar issues of the case presented in this report should be underlined. Firstly, the patient had abdominal pain, which is rarely associated to dermoid cyst. Secondly, the presence of the fetus hampered the execution of US examination and distorted the normal anatomy as

the left ovary was dislocated in the upper left region of the abdomen; moreover, the lesion did not show typical US features suggestive for teratoma, such as the Rokitansky nodule; indeed, a “target” sign was detected surrounded by fluid that mimicked a bowel invagination; furthermore, the lesion had not been shown on previous US examinations, but this latter finding could be reasonable supposing that the mass grew very rapidly due to the specific expression of hormone receptors. On the other hand, the sub-optimal MRI acquisition did not allow to establish neither the anatomic landmarks of the mass with the surrounding organs, including the descending colon, nor the presence of inner calcifications; moreover, the condition of claustrophobia, which is very common in patients undergoing MRI examination, is usually more pronounced in pregnant patients. In detail, CT examination was crucial to get the final diagnosis due to its higher spatial resolution and the possibility to evaluate the heterogeneous density of the mass, usually composed by fat and calcium mixed to other tissues; in particular, CT, as a modality, is capable of a clear characterization of the lesion structure and its anatomic landmarks with the surrounding organs.

Although US and MRI examinations are modality of choice during pregnancy, they have some important shortcomings. Abdominal US is nonpanoramic and often disturbed by bowel air and peristalsis. On the other hand, MRI cannot evaluate tissue density and calcifications and requires long acquisition time. Therefore, the integration of multiple imaging techniques can be crucial to get the final diagnosis especially when clinical presentation is sneaky [8]. In this setting, it is important to mention hybrid imaging, which can also play a key role for the characterization of both benign and malign lesions. It combines morphologic and functional imaging and can have numerous current and future applications [9,10].

In conclusion, ovarian teratoma may show atypical clinical and imaging presentation. Pregnancy may hamper the possibility to clearly characterize teratoma using US and therefore tomographic imaging techniques may be required. Even if MRI examination is the modality of choice to avoid radiation exposure, patients’ claustrophobia may determine poor col-

laboration and significantly affect image quality, hence rendering necessary the recourse to CT, especially in emergency cases. Thus, integrated imaging approach is recommended.

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