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Case Report

Spontaneous rupture of a uterine leiomyoma accompanied by a hematoma appearing as a cystic lesion on imaging: A case report ☆

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ABSTRACT

The rupture of a uterine leiomyoma is a rare complication. We report a case of ruptured leiomyoma that formed a hematoma that was initially suggestive of an ovarian origin. Magnetic resonance imaging revealed intact ovaries and a cystic lesion adjacent to leiomyomas. During surgery, the cystic lesion was found to be a hematoma caused by a rupture of the leiomyoma.

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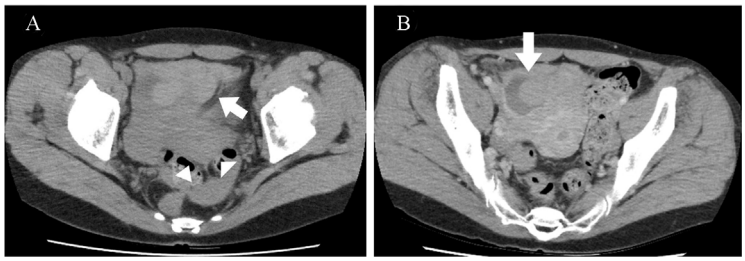

Fig. 1 – (A) Noncontrast CT shows a high attenuated area which are considered to be hematoma and hemorrhagic ascites (arrow) which was ventrally-adjacent to the uterus (arrowhead). (B) Contrast CT taken an hour later shows area with no enhancement in the mass (arrow) which corresponds to the cystic lesion found with ultrasound. CT, computed tomography.

Introduction

Uterine leiomyomas are common benign tumors that rarely cause an acute abdomen. Known complications that may lead to an acute abdomen include acute torsion of a pedunculated subserosal leiomyoma, red degeneration, intraperitoneal hemorrhage, and mesenteric vein thrombosis resulting from persistent pressure on the vein [1]. Computed tomography (CT) can reveal a pelvic mass and intra-abdominal bleeding when a leiomyoma ruptures. However, because of its rarity, the usual preoperative diagnosis is bleeding of unknown origin, and only few previous reports on magnetic resonance imaging (MRI) findings are available.

Case description

A 46-year-old woman presented at our hospital with persistent abdominal pain. The pain suddenly began the previous day. She had no significant medical history. Her vital signs were within normal ranges. Laboratory analysis showed elevated serum level of white blood cell number at 12,200 per microliter (normal range, 3,300-8,600 per microliter), slightly low level of hemoglobin at 11.5 g/dL (normal range, 11.6-14.8 g/dL), high level of C-reactive protein (CRP) at 7.21 mg/dL (normal range, <0.14 mg/dL), and high level of cancer antigen-125 (CA-125) at 574 U/mL (normal range, <35 U/mL).

Transvaginal ultrasonography revealed a cystic lesion, 45 mm in diameter, on the right side of the uterus. A leiomyoma was identified in the uterine fundus. Her CT tomography revealed a cystic lesion adjacent to the uterine fundus (Fig. 1). The hematoma surrounded the cystic lesion, and hemorrhagic ascites were present. T2-weighted MRI showed low signal masses in the uterine wall, which were believed to be uterine leiomyomas (Fig. 2). The cystic lesion was broadly bordered by leiomyomas, and a fluid-fluid level was present. The signal was high in the ventral portion of the cystic lesion and mildly high in the dorsal portion. In the dorsal portion of the cystic lesion and to the left side outside the cystic lesion, an area with a mildly high T2 signal and a high to slightly high T1 signal were observed, which was considered a hematoma (Fig. 3). Diffusion-weighted images showed high signal intensity on the dorsal side of the cystic lesion (Fig. 4). No fat suppression was observed in the cystic lesions. The bilateral ovaries were apparently normal, which excluded the possibility that the ovaries were the origin of the cystic lesions.

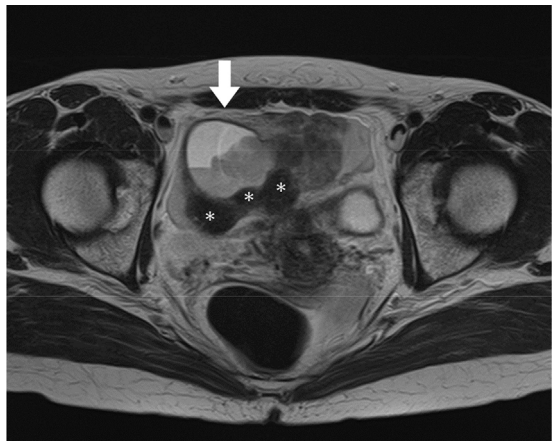

Fig. 2 – T2-weighted image showing a cystic lesion with a low-signal component located dorsally (arrow). The cyst was adjacent to a low-signal mass suggestive of a typical leiomyoma (*). The high-attenuation area found on the plain CT image showed a mixed signal. CT, computed tomography.

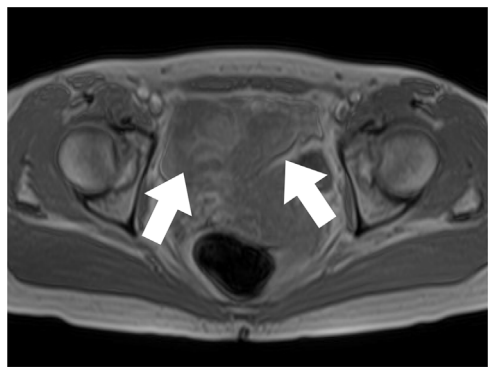

Fig. 3 – T1-weighted image in the same section as in Fig. 2. The dorsal part of the cystic lesion and outside the cystic lesion to the left showed high-to-mildly high signals and lacked fat intensity, indicative of blood (arrows).

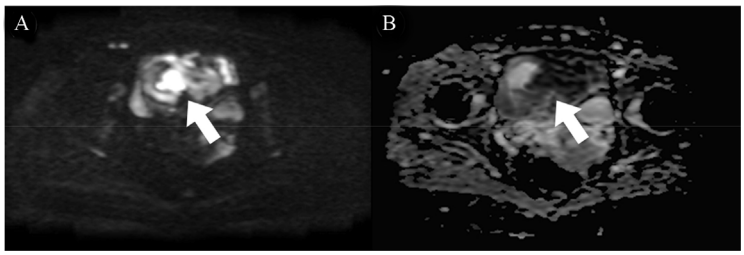

Fig. 4 – DWI (A) and ADC map (B) at the same section as Fig. 2. Diffusion was restricted in the dorsal part of the cystic lesion (arrows). DWI, diffusion weighted imaging; ADC, apparent diffusion coefficient.

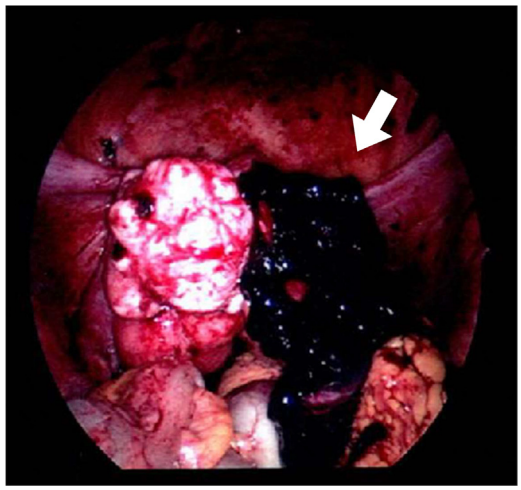

Fig. 5 – Laparoscopic image during operation. The ruptured leiomyoma was covered with hematoma (arrow).

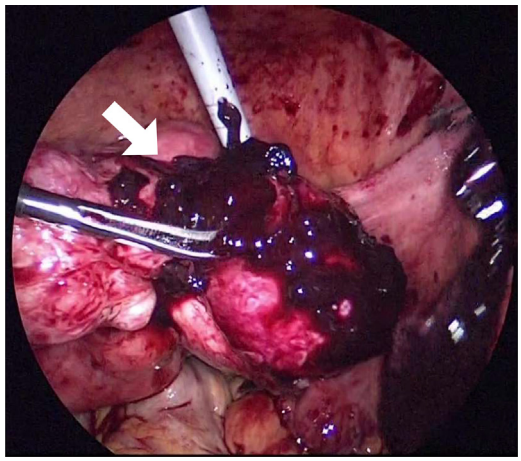

Fig. 6 – Hematoma was filled within membrane of ruptured leiomyoma.

The patient was then admitted to our hospital for surveillance. On the day after admission, her symptoms persisted, and laboratory analysis revealed higher CRP (14.20 mg/dL) and lower hemoglobin levels (7.9 g/dL). Laparoscopy was performed to investigate the underlying cause. After the hematoma that covered the mass was removed, the surface membrane of the subserosal leiomyoma was found to be ruptured, and a hematoma accumulated within the membrane (Figs. 5 and 6). This structure corresponded to the cystic lesions observed in the images. Continuous bleeding was observed during surgery. Laparoscopic drainage was performed and the leiomyoma was resected. A pathological examination confirmed the diagnosis of leiomyoma. No evidence of malignancy or degeneration was found.

Discussion

Rupture of leiomyomas is rare. There have been 125 reports of abdominal hemorrhages caused by leiomyoma [2]. Of the 125 cases, four resulted in death. Abdominal hemorrhage from leiomyomas can have two causes. The first is the rupture of a vein on the surface of the leiomyoma. The other is rupture of the leiomyoma itself, as in this case. Of these cases, 60.8% resulted from the former cause. Other than the 125 reports, rupture of the vascular pedicle in addition to avulsion of the leiomyoma itself was observed in one case [3]. The average maximum diameter of the ruptured leiomyoma is 12.6 cm, which is larger than that in our case. Subserosal leiomyomas were more likely to cause hemorrhage, summing up to 37.6% of the reports. The fundus was the most likely location of the leiomyoma. Thus, the type and location of ruptured leiomyoma in our patient were typical. The most common symptom was sudden onset of lower abdominal pain, which was also observed in our case. Low-volume shocks have also been reported frequently. Our patient did not technically fall into shock, but the hemoglobin level decreased before surgery.

The diagnosis of hemorrhage from leiomyoma is difficult, and only a few cases are correctly diagnosed preoperatively. Among the few cases, extravasation on contrast CT was directly observed in the subserosal leiomyoma [4]. In another case, a serpiginous hyperdense area within the leiomyoma led to a correct preoperative diagnosis [5].

To the best of our knowledge, few reports describe the MRI findings of ruptured leiomyomas. In 1 case, a ruptured leiomy-

oma showed mixed signal intensity on T2-weighted imaging [6]. The lesion shows a small discontinuity on its surface. In another case, a pedunculated leiomyoma showed heterogeneous signals [7]. An ill-defined interface between the mass and uterus was observed. These cases suggest that MRI has no definite role in the diagnosis. Our case did not lead to a definitive preoperative diagnosis. However, retrospectively, we believe that MRI helped raise the diagnosis of ruptured leiomyoma. MRI helped to exclude the possibility of the ovaries as the origin of the cystic lesion in our case and to confirm the existence of leiomyoma.

However, the cystic appearance of ruptured leiomyomas has not yet been described. Since a hematoma was found below the surface membrane, we speculated that the rupture occurred near the surface of the leiomyoma and the blood accumulated in a space just below the membrane, which could have a region of sparse tissue, and with membrane expansion, a cystic appearance could form. When rupture occurs far from the surface, blood can accumulate in regions of sparse tissue that might be irregularly shaped, leading to a serpiginous appearance or mixed signal intensity. In cases with a cystic appearance, such as in our case, an adenomyotic cyst could be a differential diagnosis. MRI findings of adenomyotic cysts include hemorrhagic cysts surrounded completely or partly by hypointense tissue on T2-weitghted images [8]. Excluding this possibility is difficult, although the absence of hyperintense cysts indicates that adenomyotic cysts are unlikely. The rapid decrease in hemoglobin levels observed in the present case is also unlikely in an adenomyotic cyst.

Although the rupture of a uterine leiomyoma is a rare event, it is among the causes of an acute abdomen. We describe a case of uterine leiomyoma rupture accompanied by a hematoma that appeared as a cystic lesion on imaging. This is the first case report describing the rupture of a uterine leiomyoma that may appear as a cystic lesion on imaging studies. MRI is useful for distinguishing the origin of the lesion in such cases.

Patient consent

Written informed consent for academic publication of the case was obtained from the patient.

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