

A Giant Subserosal Uterine Leiomyoma Mimicking an Abdominal Mass: Multimodal Imaging Data

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Abstract- Giant uterine leiomyomas are extremely rare neoplasms and are challenging both diagnostically and therapeutically. A 49-year-old premenopausal female presented at our Department complaining of abdominal pain and distention for several years. Ultrasound (US), color Doppler US, abdominal computed tomography imaging after administration of contrast material, and abdominal magnetic resonance imaging were performed. Histopathologic examination revealed a pedunculated subserosal uterine leiomyoma. In this case report, we present abdominopelvic multimodal radiologic imaging findings of our patient with a giant subserosal uterine leiomyoma, in conjunction with histopathological findings.

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Introduction

Leiomyomas or fibroids arise from overgrowth of the smooth muscle and connective tissue of the uterus, and most commonly involve the uterine corpus, although they may also occur in the cervix in a minority of instances. Typical fibroids are easily recognized on imaging. However, an atypical presentation caused by degenerative changes can cause diagnostic confusion (1,2). The use of color Doppler ultrasonography (CDUS) to visualize interface vessels between the uterus and a juxta-uterine mass is useful in the differential diagnosis. Also, magnetic resonance imaging (MRI) yielding multiplanar views can reveal the peduncle, or confirm the presence of a normal uninvolved ovary (3). In this case report, we present multimodal abdominopelvic radiologic imaging findings of a patient with a giant subserosal uterine leiomyoma, in conjunction with histopathological findings.

Case Report

A 49-year-old female presented to our Department with a history of abdominalgia (vague sensations of abdominal pressure). Laboratory test values were within normal limits. On physical examination, a vague

abdominal fullness was palpated. Transabdominal ultrasound (US), abdominopelvic computed tomography (CT), and MRI scanning revealed a large, complex, multicystic, abdominopelvic mass.

Abdominal US revealed a large, heterogeneous, relatively hypoechoic, multicystic mass 30 × 17 cm in area. CDUS detected arterial and venous vascular flow within a peduncle which connected the upper left side of the uterine corpus with the giant mass. The peduncle diameter was 2 cm.

Contrast-enhanced helical CT of the abdomen and pelvis revealed a well-circumscribed, heterogeneous, extra-uterine mass, arising from the left side of the pelvis and extending into the right upper abdominal quadrant. The mass was closely associated with (but however distinct from) the right psoas muscle, and the aortoiliac vascular and bowel loops (Figure 1 a, b). The uterus was normal in size.

Abdominopelvic MRI revealed a well-circumscribed, multicystic, heterogeneous mass, of predominantly high signal intensity on T2 weighted imaging (WI) and of low signal intensity on T1–WI. Contrast-enhanced multiplanar MR imaging revealed a giant pedunculated subserosal leiomyoma heterogeneous in terms of contrast enhancement. The tumor measured approximately 30 × 17 × 25 cm. The multiplanar imaging feature of MRI

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enabled us to identify a thick stalk running between the uterine corpus (the upper left body) and the mass (Figure 2 a, b, c, d). No free fluid or lymphadenopathy was evident. Surgical removal of both the uterus and the mass confirmed our diagnosis of a giant pedunculated

subserosal leiomyoma originating from the uterus. The ovaries were normal, and the mass seemed to displace the uterus, bowel loops, and aortoiliac structures posterior and lateral to the mass in the abdominal cavity.

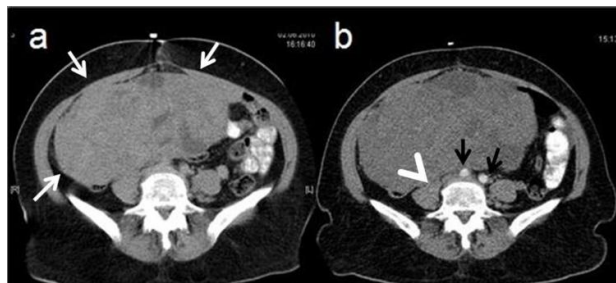


Figure 1. a) An axial non-contrast-enhanced abdominopelvic CT scan showed a well-circumscribed intra-abdominal mass of soft tissue extending into the right upper abdominal quadrant (white arrows). b) Contrast-enhanced abdominal CT revealed a heterogeneously enhanced mass of approximately 30 × 17 cm in area. The mass was close to but distinct from, the right psoas muscle (arrowhead) and the iliac vessels (black arrows).

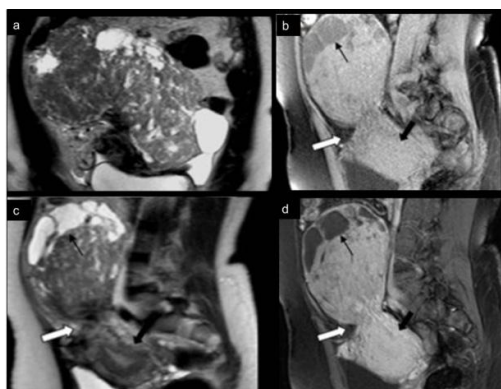


Figure 2. Coronal (a) and sagittal (b) abdominopelvic MRI revealed a multicystic (thin black arrows) heterogeneous mass exhibiting predominantly low signal intensity on T1-weighted imaging (WI) (b) and high signal intensity on T2-WI (c). Sagittal MR imaging revealed a thick stalk (white arrows) connecting the mass with the uterus (thick black arrows). The giant pedunculated subserosal leiomyoma was heterogeneous in terms of contrast enhancement (d).

Laparotomy revealed a large pedunculated tumor, with a well-circumscribed border, arising from the uterine fundus. Examination of frozen sections allowed diagnosis of leiomyoma. Abdominal hysterectomy was performed. Gross pathologic examination revealed a smooth multiloculated cystic mass 33 × 25 cm in area. Microscopic examination of the mass identified a benign tumor featuring degenerative changes. Interlacing fascicles of smooth muscle cells and minimal stroma were apparent, as was focal hyalinization. Areas of hemorrhage were noted. The mitotic count was elevated, and some small veins were filled with thrombi in the sections studied. Histological examination of hematoxylin–eosin revealed a soft-tissue lesion with prominent edema and cystic necrotic degeneration, hemorrhages and areas of hyalinization, numerous centrally located thick-walled blood vessels, and elongated nuclei typical of smooth

muscle. No significant atypia was evident (Figure 3). Histologically, the final diagnosis was a pedunculated uterine leiomyoma. The patient's postoperative course was uneventful.

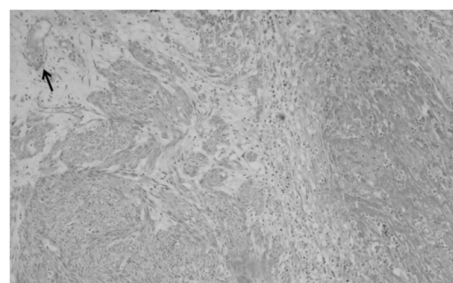


Figure 3. Photomicrograph showing fascicles of smooth muscle cells with a venous thrombus (arrow) (Hematoxylin & Eosin, ×100).

Discussion

Uterine leiomyomas are the most common form of benign uterine tumors of the female reproductive tract, occurring in 20–30% of females older than 30 years. Histologically, smooth muscle cells proliferate monotonically. A typical leiomyoma is easily recognized by imaging. However, degenerative changes may cause a leiomyoma to assume an atypical appearance that can cause diagnostic confusion. As a leiomyoma enlarges, it may outgrow its blood supply, resulting in various types of degeneration. These include hyaline, myxoid, or cystic degeneration; dystrophic calcification; and red degeneration. Of these, hyaline degeneration is the most common, occurring in up to 60% of cases. Cystic degeneration, observed in about 4% of leiomyomas, may be considered to be an extreme sequela of edema (1,2). Rarely, a uterine leiomyoma may undergo malignant degeneration to become a sarcoma. The incidence of malignant degeneration is less than 1.0% and has in fact been estimated to be as low as 0.2% (4).

A pedunculated uterine leiomyoma develops when a fibroid mass is connected with the uterus via a stalk and may grow either within the uterine cavity (submucosal) or outside of the uterus (subserosal). Such leiomyomas simulate ovarian neoplasms (1). These tumors can become twisted (kinked), obstructing blood vessels that feed the tumors. In such cases, prompt surgery is required (4). Sonographic imaging methods are the primary (and most cost-effective) modalities used for detection of leiomyomas. The tumors typically appear solid in echogenic terms (although they may be slightly hypoechoic if through-transmission is poor) (1). The origin of a pedunculated leiomyoma may be obscure, and the leiomyoma can be mistaken for a lesion of ovarian origin. If a pelvic mass is clearly separated from both the ovary and the uterus, US imaging-triggered diagnosis of a pedunculated subserosal leiomyoma can be made if a vascular pedicle is apparent or if recurrent shadowing suggestive of a leiomyoma is present. However, such features may not always be detected by sonography (1,5).

CT is not the primary modality used for diagnosis or evaluation of leiomyomas. However, fibroids are often incidentally detected by CT. Therefore, familiarity with the appearance of such fibroids on CT is important. Degenerated leiomyomas present with reduced attenuation and are poorly enhanced after administration of contrast material (1,4).

MRI and particularly the multiplanar imaging capabilities thereof may reveal a vascular peduncle or

another form of attachment of a leiomyoma of the uterus. Moreover, typical non-degenerated leiomyomas exhibit a characteristic low-to-intermediate signal intensity on T1-WI and a low signal intensity on T2-WI. However, degenerated leiomyomas are variable in terms of MRI signal characteristics. Myxoid degeneration and necrosis may be present as high signal intensity areas on T2-WI with no enhancement. Another common variant seen on both T1- and T2-WI is cobblestone-like tissue attributable to hyaline degeneration with foci of high signal intensity representing areas of infarction caused by rapid growth (3,5).

Cystic lesions in the female pelvis usually originate from the ovary. Non-ovarian cystic pelvic lesions include peritoneal inclusion cysts, para-ovarian cysts, mucocoeles of the appendix, hydrosalpinx, subserosal or broad ligament leiomyomas featuring cystic degeneration, cystic adenomyosis, cystic degeneration of a hematoma, abscess, and lymphocoeles. Ultrasound-guided percutaneous biopsy of the tumor prior to surgery may assist determination of the precise histologic composition. Four percent of fibroids undergo cystic degeneration accompanied by extensive edema. Cystic fluid-filled spaces develop. Exclusion of an ovarian or tubal origin of a tumor can be achieved on US or MRI if normal ovaries are apparent (5). In current patient, the predominantly cystic nature of the lesion suggested a presumptive diagnosis of a tumor with primary epithelial ovarian origin. Multiplanar imaging using MRI allowed us to note that the giant multicystic mass was connected via a stalk with the uterus in the absence of any associated ascites or elevated levels of serum tumor markers. Then the diagnosis of pedunculated subserosal leiomyoma was made for the patient.

In conclusion, most uterine leiomyomas may be confidently diagnosed using sonography. However, degenerative changes may create heterogeneous or unusual appearances that contribute to diagnostic confusion (3,5). CT and MRI may facilitate characterization of giant pelvic and abdominal masses and determine the organ of origin. This was consistent with the present patient. In similar patients, MRI should be used as a problem-solving method to define uterine and adnexal pathology.

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