MRI FINDINGS OF COTYLEDONOID DISSECTING LEIOMYOMA OF THE UTERUS

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A B S T R A C T

Cotyledonoid dissecting leiomyoma of the uterus is an extremely rare smooth muscle tumor and is classified as leiomyoma with growth pattern variants. We report a case of cotyledonoid dissecting leiomyoma of the uterus, and discuss the diagnostic MRI findings, including diffusion-weighted MRI and contrast-enhanced dynamic MRI.

Key words: Magnetic Resonance Imaging; Diffusion Magnetic Resonance Imaging; Dynamic MRI; Gadolinium DTPA; Uterus; Fibroid

I n t r o d u c t i o n

Cotyledonoid dissecting leiomyoma of the uterus is an extremely rare, benign smooth muscle tumor of the uterus, classified as a leiomyoma with growth pattern variants in the World Health Organization (WHO) histological classification of the tumors of the uterine corpus.1,2 Roth et al.1 designated four cases of these tumors as “cotyledonoid dissecting leiomyoma” of the uterus in 1996. Conventional uterine leiomyomas are symmetrical, expansile, rounded, and circumscribed, while Roth et al.1 focused on the appearance of the exophytic component, which is deep red and bulky, resembles cotyledons of the placental tissue and extends from the lateral uterine surface in the region of the cornu. These tumors are connected with the endophytic component of the dissecting patterns in the uterine myometrium by fascicles of neoplastic smooth muscle.

C a s e  R e p o r t

A 39-year-old nulliparous woman presented feeling an abdominal mass for 6 months, and an intrapelvic mass was found at a local hospital. The mass was suspected to be an ovarian malignant tumor, and she was referred to our institution. Pelvic MRI showed a solid mass on the dorsal side of the uterine corpus, which filled the whole pelvic cavity, maintaining the existing structures. On a T2-weighted image (T2-WI), both ovaries were identified as separate from the mass, and there were flow voids between the mass and uterine corpus (Fig. 1 A, B).

Figure 1-A: Sagittal T2-weighted fast spin-echo MRI (T2-WI) shows a solid mass (arrows) on the dorsal side of the uterine corpus. There are flow voids (arrowheads) between the mass and uterine corpus. The solid mass shows heterogeneous high signal intensity, and iso-signal intensity multinodular structures are seen in the mass. The perinodal area in the mass shows reticular high signal intensity.
On contrast-enhanced dynamic MRI, each nodule showed extremely weak, gradually increasing enhancement compared to the outer myometrium (Fig. 3 A-E). The mass was suspected to be continuous with the dorsal side of the uterine cornu. The solid mass showed heterogeneous high signal intensity compared to the outer myometrium, and iso-signal intensity multinodular structures were seen in the mass. The perinodal area in the mass showed reticular high signal intensity on T2-WI. Hemorrhage or necrosis was not identified in the mass. On DWI (b = 1000 s/mm²), the mass showed iso-signal intensity compared to the outer myometrium, and the apparent diffusion coefficient (ADC) map did not show restricted diffusion in the mass. The ADC values of the mass were 1.9x10⁻³ mm²/s (Fig. 2 A,B).
No retroperitoneal lymph node swelling or peritoneal dissemination was found. Small amounts of ascites were seen in the pouch of Douglas. There were no likely suggestions of a malignant tumor, and we speculated that the tumor arose from the uterine mesenchyme. We preoperatively diagnosed a benign uterine smooth muscle tumor, which showed an atypical morphological development. Surgical exploration confirmed a pinkish, solid polypoid mass, which arose from the posterior surface of the uterine corpus into the pelvic cavity (Fig. 4A). The polypoid mass was attached to the posterior aspect of the uterine corpus. The morphology of the mass was discoid, formed of numerous finger-like or bulbous protrusions (Fig. 4B). Both ovaries and fallopian tubes appeared unremarkable. The pathological diagnosis of a frozen section was leiomyoma. Conservative surgery was performed for the purpose of preserving fertility; the tumor was resected including the pedicle and an approximately 1.5-cm depth of the uterine myometrium. The polypoid mass was sized 14.0 x 14.0 x 6.0cm and pathological examination revealed multinodular proliferating smooth muscle cells which did not show a significant cytological atypia or coagulative necrosis (Fig. 4C).

Figure 4-A: A pinkish, solid polypoid mass arises from the posterior surface of the uterine corpus into the pelvic cavity. Arrow shows the cephalic direction. U= uterus.

Figure 4-B: Resected specimen including pedicle (arrows) shows a discoid mass formed of numerous finger-like or bulbous protrusions.

Figure 4-C: Pathological examination (Hematoxylin and eosin stain x20) reveals multinodular proliferating smooth muscle cells which do not show a significant cytological atypia or coagulative necrosis. Regions of edema and hyaline degeneration are seen in the nodules, and the perinodal stroma shows a highly hydropic degeneration containing congested vessels.

Discussion

Approximately 20 cases of cotyledonoid dissecting leiomyoma have been reported in the literature. These cases ranged in age from 23 to 41 year-old, and the tumors ranged in size from 10 to 25 cm. To explain the deep red color of the exophytic components, it is hypothesized that the tumor impedes venous drainage as it grows in cotyledonoid patterns beyond the confines of the uterus and congestion develops. One possible explanation for this characteristic extension of the tumor is that the tumor extends along muscular vessels from the stratum vasculare of the uterine corpus into the connective tissue of the broad ligament, since there is no anatomical barrier. The endophytic component shows tongues of abnormal smooth muscles that extend significantly from the parent leiomyoma between the fascicles of the adjacent myometrium, which was characterized by ill-defined borders.

Accurate preoperative assessment of uterine lesions and the characterization of them as benign or malignant can be very important to narrow the differential diagnoses in order to avoid overtreatment, especially
Malignant tumor but did not show restricted diffusion on DWI. This MRI finding was useful for the pre-operative diagnosis and may reflect low cell density and edematous stroma in the tumor that were observed the pathological findings.

The usefulness of contrast-enhanced dynamic MRI in the differential diagnosis of leiomyosarcoma from ordinary leiomyoma has been reported. Goto et al. reported that degenerated leiomyoma shows slight or irregular enhancement on contrast-enhanced dynamic MRI. Leiomyosarcoma shows rapid enhancement in the early phase (at 20-90 seconds), and the myometrium is enhanced gradually in the later phase (at 120-180 seconds) on contrast-enhanced dynamic MRI. In our case, the contrast-enhanced dynamic MRI finding was extremely weak, with gradually increasing enhancement compared to the outer myometrium. This MRI finding may reflect the pathological findings that the blood flow of the tumor was decreased due to congestion.

Intravenous leiomyomatosis has multiple myometrial masses or a lobulated myometrial mass, which is a wormlike plug tumor that extends within the veins of the broad ligament. The infiltration pattern of cotyledonoid dissecting leiomyoma may be similar to that of intravenous leiomyomatosis. Intravenous leiomyomatosis may also show marked hydropic degeneration. A rigid distinction between intravenous leiomyomatosis and cotyledonoid dissecting leiomyoma may be difficult to make based on the morphological and lesion characterization on MRI.

Clinicians and radiologists should be alert to the presence of this rare disease entity and should recognize the characteristics of imaging findings and differential diagnoses. In our case, MRI findings reflected the pathological findings of this rare tumor. In addition to the morphological imaging assessment, comprehensive evaluation of each sequence including DWI and contrast-enhanced dynamic MRI may be useful to differentiate cotyledonoid dissecting leiomyoma from other malignant tumors, especially uterine sarcomas. Being familiar with the MR imaging diagnosis of this disorder may help to determine the precise management strategy, including fertility preservation surgery.

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References


