International Journal of Radiology Research
www.radiologyjournal.in
E-ISSN: 2663-4562
Received: 05-03-2026; Accepted: 05-04-2026; Published: 20-04-2026
Volume 8, Issue 2, 2026, Page No. 5-7

MRI diagnosis of a large broad ligament leiomyoma with bizarre nuclei mimicking an adnexal mass in a young female: A case report

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Abstract
Leiomyomas are the most common benign tumors of the uterus, arising from smooth muscle cells of the myometrium [1]. While typically confined to the uterus, they may occasionally occur in extrauterine locations such as the broad ligament, where they can mimic adnexal or ovarian masses [3]. Leiomyomas with bizarre nuclei (also termed symplastic or atypical leiomyomas) represent a rare histological variant characterized by marked nuclear atypia but benign clinical behavior [5].
Accurate diagnosis is essential, as these lesions may be mistaken for malignant tumors such as leiomyosarcoma, especially when large or atypical in location [5]. Imaging, particularly MRI, plays a crucial role in identifying uterine origin, while histopathology confirms the diagnosis [4].

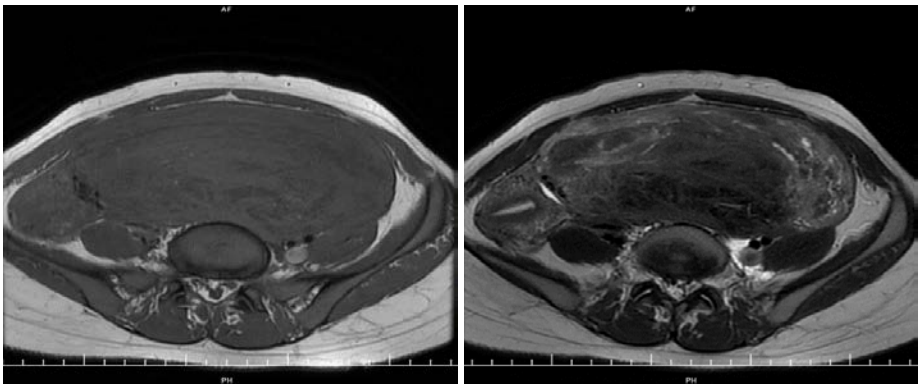
Keywords: Broad ligament leiomyoma, leiomyoma with bizarre nuclei, symplastic leiomyoma, adnexal mass, uterine claw sign, MRI pelvis

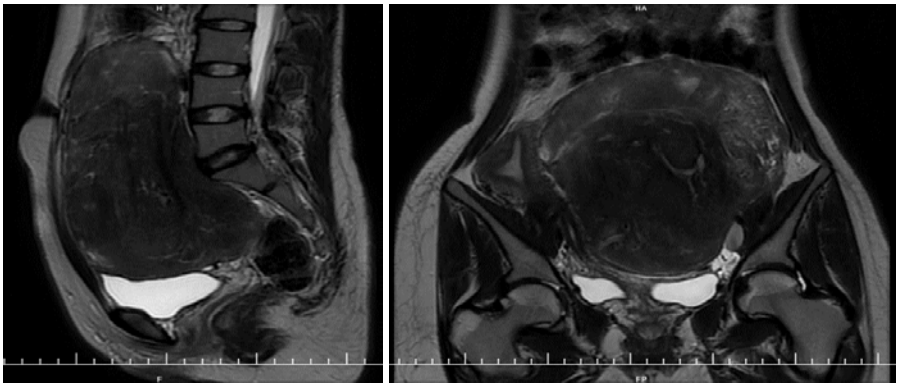
Introduction
Leiomyomas are the most common benign tumors of the uterus, arising from smooth muscle cells of the myometrium. While typically confined to the uterus, they may occasionally occur in extrauterine locations such as the broad ligament, where they can mimic adnexal or ovarian masses. Leiomyomas with bizarre nuclei (also termed symplastic or atypical leiomyomas) represent a rare histological variant characterized by marked nuclear atypia but benign clinical behavior.
Accurate diagnosis is essential, as these lesions may be mistaken for malignant tumors such as leiomyosarcoma, especially when large, rapidly growing, or atypical in location. Imaging, particularly MRI, plays a crucial role in identifying uterine origin, while histopathology confirms the diagnosis.

Materials and Methods
A 23-year-old unmarried female presented with complaints of a gradually increasing abdominal mass for 3–4 months. Menstrual history was unremarkable.
Clinical examination revealed a large abdominopelvic mass extending superiorly up to just above the umbilicus. Initial Evaluation with ultrasonography was performed, followed by contrast-enhanced MRI pelvis for further characterization.

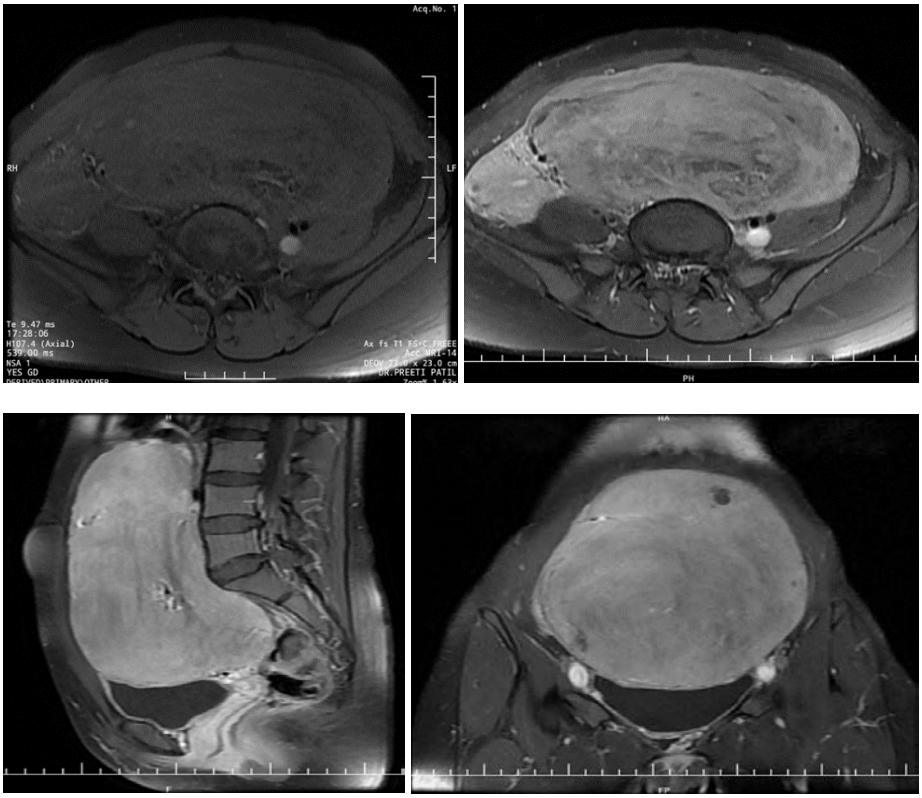
Imaging Findings
Ultrasound findings
A large heterogeneous soft tissue mass (~20 × 17 × 11 cm) in the left adnexa with areas of degeneration/necrosis was noted. The lesion is hypovascular on color Doppler interrogation. Uterus and right ovary visualized separately. Mild bilateral hydroureteronephrosis (left > right), likely due to compression of the ureters by the mass lesion.

MRI findings
Large, well-defined, T1 isointense, T2 hypointense lesion (~7.9 × 15.2 × 17.6 cm) in the pelvis, likely arising from left adnexa, extending into abdomen with cystic/degenerative areas. Feeding vessel from left uterine artery noted. Maintained fat planes with adjacent structures.
Mass effect in the form of displacement of uterus and right ovary to right, left ovary to left and bowel loops superiorly and compression of bilateral ureters with resultant hydroureteronephrosis (L > R).





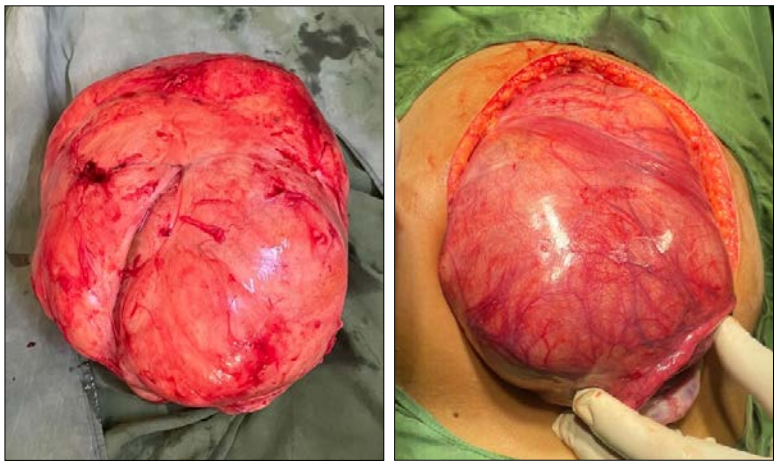
Hypoenhancement in early phase, delayed homogeneous enhancement similar to uterine myometrium.



Above features are likely to suggest **broad ligament leiomyoma / exophytic uterine leiomyoma**

The patient subsequently underwent surgical excision of the mass. The excised specimen was subjected to gross and histopathological examination. Immunohistochemistry (IHC) using smooth muscle markers, including caldesmon and smooth muscle actin (SMA), was performed.

Gross specimen showed a soft tissue mass measuring 21x15.5x10 cm, firm in consistency, grey white in colour. Cut section revealed whorled appearance of the mass.



Microscopic examination showed smooth muscle tumour composed of spindle, cigar shaped cells arranged in fascicular pattern and diffuse pattern. Nuclei are bizarre shaped, hyperchromatic, multilobulated with nuclear pseudo inclusions. Low Mitotic figures <5 mitoses/10 hpf. No tumour necrosis seen, along with variable blood vessels as staghorn pattern and few blood vessel have thickened wall. Intermixed are normal spindle shaped smooth muscle cells
IHC studies with Caldesmin suggest presence of smooth muscle actin.
Final diagnosis of broad ligament leiomyoma with bizarre nuclei was made.

Discussion

Broad ligament leiomyomas are rare and account for a small proportion of extrauterine fibroids[3]. They arise either from smooth muscle fibers within the broad ligament or as exophytic uterine leiomyomas extending into the ligament[3]. Their unusual location often leads to diagnostic confusion with ovarian neoplasms[3].
MRI plays a key role in differentiating leiomyomas from adnexal masses by demonstrating features such as T2 hypointensity, uterine claw sign, and vascular supply from the uterine artery[4]. These imaging findings are crucial in narrowing the differential diagnosis and guiding management[4].
Leiomyoma with bizarre nuclei is a benign variant characterized by significant nuclear atypia, including hyperchromatic, multilobulated nuclei with pseudo-inclusions[5]. Despite alarming cytological features, these tumors demonstrate low mitotic activity and lack tumor cell necrosis, distinguishing them from leiomyosarcoma[5].
Leiomyosarcomas, in contrast, typically exhibit high mitotic activity, tumor necrosis, and infiltrative growth patterns[5]. Therefore, histopathological evaluation remains the gold standard for definitive diagnosis[5].

Conclusion

Broad ligament leiomyomas can mimic adnexal masses clinically and radiologically[3]. MRI plays a pivotal role in identifying uterine origin and narrowing the differential diagnosis[4]. Recognition of leiomyoma with bizarre nuclei is important to avoid misdiagnosis as malignancy and prevent overtreatment[5].

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