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Isolated retroperitoneal leiomyoma with adhesion to the iliac vessel in a middle-aged female

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Abstract

Leiomyoma is a common benign mesenchymal tumour, but its occurrence in the retroperitoneum is rare and is referred to as retroperitoneal leiomyoma. The clinical presentation is often non-specific, leading to a diagnostic challenge for surgeons. Although preoperative diagnosis remains difficult even with radiological imaging, radiologists play a crucial role in assisting the surgical team by facilitating a multidisciplinary approach for optimal outcomes. We report the case of a 40-year-old female who presented with low back pain and abdominal discomfort for five months. Radiological imaging revealed a retroperitoneal mass possibly adherent to the left iliac vessel. The patient underwent meticulous retroperitoneal dissection, and histopathological examination confirmed the diagnosis of retroperitoneal leiomyoma.

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Introduction

Retroperitoneal Leiomyoma (RL) is a rare clinical entity, referring to benign mesenchymal tumours of smooth muscle cells located in the retroperitoneum.[1-5] It accounts for about 1.2% of primary retroperitoneal tumours.[3-6] It is more commonly seen in women during the perimenopausal period.[7] Around one-quarter of patients with RL are asymptomatic.[6] When symptoms do occur, they are often nonspecific and may include abdominal fullness, discomfort, fatigue, low back pain, urinary symptoms, and dyspareunia.[1,4,6,7]

Preoperative diagnosis based solely on clinical presentation is challenging due to its non-specific nature.[2] Imaging modalities such as ultrasonography (USG), computed tomography (CT), and/or magnetic resonance imaging (MRI) are essential for diagnostic workup.[4,9] However, even with imaging, preoperative diagnosis remains difficult.[1,4,5] Radiologists play a key role in guiding medical and surgical decisions, facilitating timely and appropriate management while avoiding unnecessary or potentially harmful treatments.[8]

The definitive diagnosis of RL is typically established through histopathological examination.[7,9] Surgical excision remains the standard treatment for RL.[1,4,7] Despite diagnostic and therapeutic challenges, the prognosis of RL is generally favourable.[4]

Case history

A 40-year-old female presented with low back pain and abdominal discomfort persisting for five months. She was the mother of two healthy children, both delivered vaginally. She attained menarche at the age of 12 and reported regular menstrual cycles with normal flow. She had no history of prior illness or surgical intervention and maintained normal bowel and bladder habits. She followed a non-vegetarian diet and denied tobacco or alcohol use. Her vital signs were within normal limits.

Abdominal examination revealed a firm to hard, non-tender mass approximately equivalent to a 16-week gravid uterus, arising from the pelvis with limited mobility. Pelvic examination showed a mild cystocele with a healthy cervix. A firm to hard mass measuring approximately 8 by 6 cm was palpated, suspected to originate from the uterine fundus. Based on initial findings, a provisional diagnosis of uterine fibroid was made, and the patient was scheduled for further investigations and imaging.

Chest X-ray and ECG were normal. Laboratory biochemical and haematological tests were within normal limits. Ultrasonography revealed a well-defined hypoechoic mass in the left pelvis abutting the left iliac vessels and the uterine fundus, with normal bilateral ovaries. The CT imaging showed a corresponding lesion that was relatively homogeneous in attenuation with mild post-contrast enhancement. The mass was in close proximity to the left common iliac artery at the level of its bifurcation. No calcifications, fat components, or lymphadenopathy were observed.

The MRI demonstrated a well-defined, lobulated pelvic mass measuring 7.9×7.3×6.3 cm (transverse, anteroposterior, craniocaudal). It appeared isointense to myometrium on T1-weighted, Figure 1A; T2-weighted, Figure 1B; and T2 fat-suppressed images, Figure 1C. The lesion had a clear interface with the uterus, Figure 1A, but was abutting the left common iliac artery at its bifurcation, Figure 1D. Both ovaries appeared normal, Figure 1B, and no lesions were identified within the uterus, Figure 1C. Based on radiological findings, a preoperative provisional diagnosis of a retroperitoneal mass with possible adhesion to the left iliac vessels was made.

The multidisciplinary team approach to surgery, including gynaecology, general surgeon, and vascular surgeons, was planned to ensure the best surgical outcome. A Pfannenstiel incision was made. A normal uterus and bilateral adnexa were visualised. A firm, fixed, encapsulated mass with a smooth surface was identified in the midline, attached to the posterior pelvic wall predominantly on the left side. The retroperitoneum was opened, revealing a mass densely adherent to the left posterolateral pelvic wall and left iliac vessels. The mass was carefully excised. During dissection, a minor

injury to the left iliac vessel occurred, which was promptly repaired by a vascular surgeon.

The resected mass was single, multinodular, greyish brown, and firm, measuring 10×9.5×6.5 cm. On cut section, it showed a homogeneous whitish surface with a whorled pattern and focal haemorrhagic areas. Histopathological examination revealed intersecting fascicles of smooth muscle cells separated by collagen strands, Figure 2.

The cells were deeply eosinophilic with blunt-ended nuclei and no evidence of necrosis, confirming the diagnosis of retroperitoneal leiomyoma. The patient had an uneventful recovery and was discharged on the fourth postoperative day. She continues to be under regular follow-up.

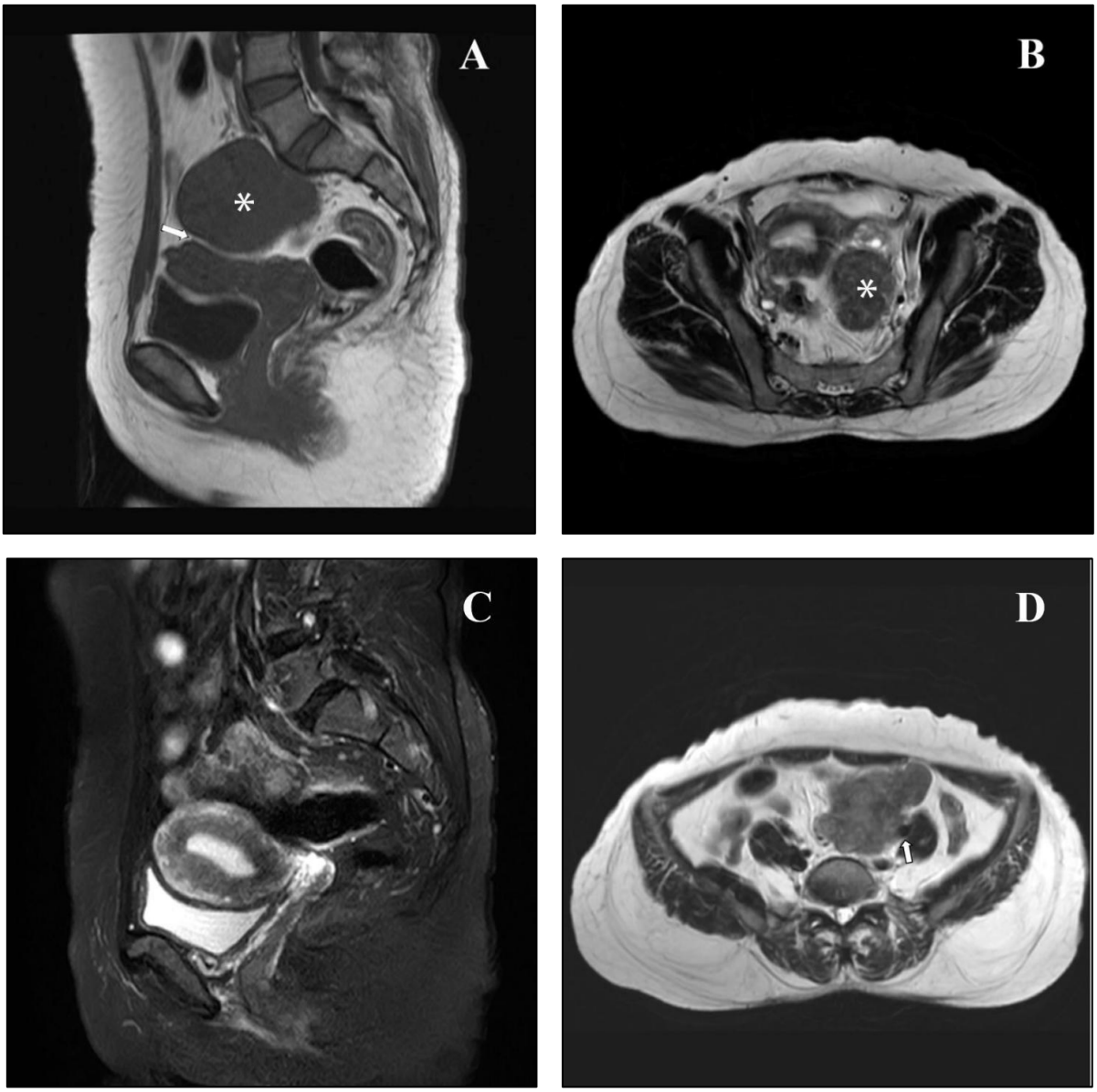

Figure 1. Magnetic Resonance Imaging (MRI) scan of the pelvis. (A) Sagittal T1-weighted image shows a well-defined mass (*) that is isointense to the myometrium, with a preserved thin hyperintense fat plane (white arrow) between the uterus and the mass. (B) Axial T2-weighted image demonstrates a pelvic mass (*) in the left posterolateral aspect of the uterus, isointense to the myometrium. Bilateral ovaries appear normal and are visible in the same section. (C) Sagittal T2 fat-suppressed image shows normal signal intensity of the myometrium and endometrium, with no focal uterine lesion. (D) Axial T2-weighted image at the level of the left common iliac artery bifurcation shows the mass abutting the medial wall of the vessel (arrow).

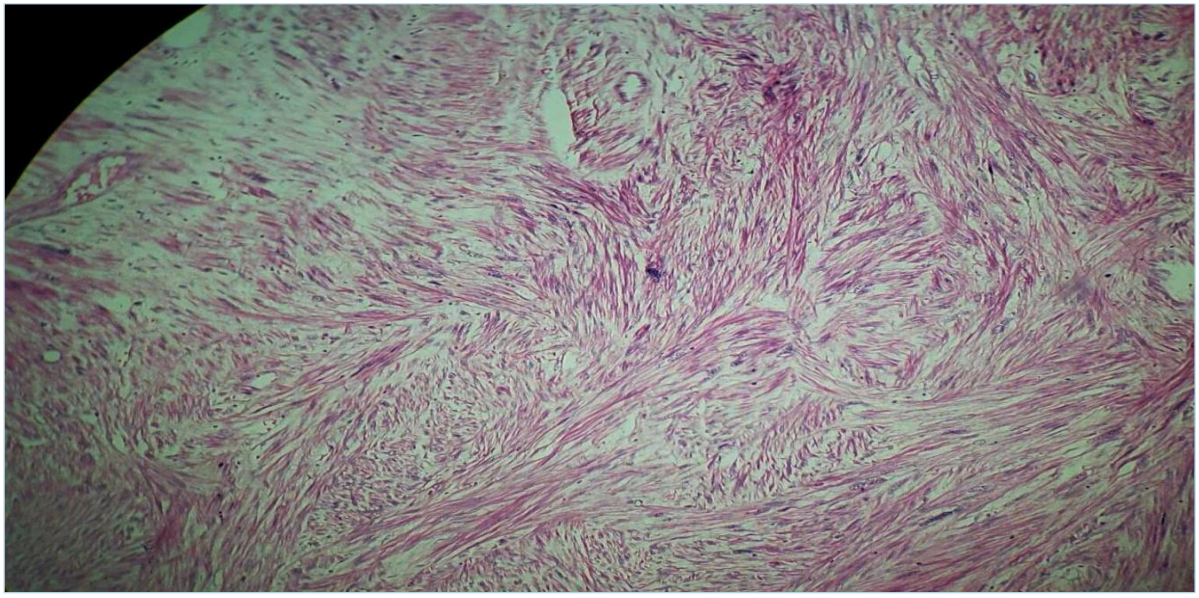

Figure 2: Microscopy section of Retroperitoneal mass showing broad fascicles of smooth muscle cells arranged in an intersecting pattern. The cells are deeply acidophilic with blunted nuclei (H and E stain, 400x).

Discussion

Leiomyoma in the retroperitoneum is a rare benign mesenchymal neoplasm derived from smooth muscle cells, comprising approximately 1.2% of all primary retroperitoneal tumours.[3–6] Even more infrequent are isolated RLs, which occur in the absence of concomitant uterine fibroids or prior gynaecologic surgery.[1–5] The case presented here illustrates such a rare isolated lesion, raising the possibility of a de novo tumour arising from hormonally sensitive remnants of the Müllerian or Wolffian ducts.[1,4,7,9,11] The patient's perimenopausal age supports a hormonal influence in tumorigenesis, consistent with observations from prior studies.[3,9]

The clinical manifestations of RL are vague and nonspecific. Patients may present with abdominal discomfort, lower back pain, or urinary symptoms, as seen in our case.[1,4,6,7] About a quarter of cases remain asymptomatic, making early diagnosis difficult.[6] The mean duration of symptoms before medical consultation is reported to be approximately five months.[6]

One of the primary diagnostic challenges lies in differentiating RL from more common gynaecologic pathologies such as subserosal uterine fibroids. On ultrasonography and CT, it often appears as a well-defined, homogenous soft-tissue mass, mimicking uterine leiomyomas.[5] In our case, initial sonographic evaluation suggested a fibroid. However, MRI provided essential diagnostic details. The lesion showed signal characteristics isointense to myometrium on both T1- and T2-weighted sequences, a preserved capsule, and a clear plane of separation from the uterus, suggesting a non-uterine origin.[3,5,7]

Additionally, MRI delineated the lesion's proximity and dense adhesion to the left common iliac artery, which was pivotal for preoperative planning. The modality's superior soft tissue contrast and multiplanar capability made it invaluable in surgical risk assessment and multidisciplinary planning.[8]

Differential diagnoses for retroperitoneal pelvic masses in women include lymphadenopathy, neurogenic tumours, sarcomas, gastrointestinal stromal tumours, and parasitic leiomyomas.[3,4,9] Among these, parasitic leiomyomas may appear radiologically similar but are typically associated with a history of prior uterine surgery or morcellation, both of which were absent in our patient.[6,11] The well-encapsulated morphology, homogenous signal intensity, and absence of necrosis or calcification in our case further supported a benign smooth muscle tumour.[7,9]

Histopathologic evaluation confirmed the diagnosis, demonstrating spindle-shaped

smooth muscle cells arranged in fascicles, lacking atypia, necrosis, or significant mitotic activity.[7]

The rarity of this case lies in the complete isolation of the RL, with no history of gynaecologic pathology or surgery. This suggests a possible primary origin in the retroperitoneum and supports the theory that RLs can arise from hormonally sensitive smooth muscle progenitors within the retroperitoneum itself.[1,4,7,9]

Surgical excision remains the standard of treatment.[1,4,7] However, resection can be complex when lesions are close to major vascular structures. In our patient, the tumour was densely adherent to the left iliac vessels, posing a significant operative risk. These challenges necessitated a coordinated multidisciplinary surgical team, including gynaecologic, general, and vascular surgeons, to ensure safe and complete tumour excision. Such collaborative approaches are known to improve surgical outcomes and reduce complications.[8]

Histopathology remains the definitive method for diagnosis.[7,9] The absence of cytological atypia, mitoses, or necrosis confirmed the lesion's benign nature. Complete surgical resection with negative margins is curative, with recurrence being exceedingly rare.[4] Our patient had an uneventful recovery and remains asymptomatic on follow-up. This case underscores the importance of considering RL in the differential diagnosis of retroperitoneal pelvic masses, particularly in perimenopausal women. The MRI plays a crucial role in diagnosis, surgical planning, and risk stratification. The isolated nature of the lesion and its close adherence to major pelvic vessels highlight the diagnostic and therapeutic complexity of such rare tumours. Early multidisciplinary involvement and individualised imaging-based planning are essential to optimise outcomes.

Conclusion

Isolated retroperitoneal leiomyoma is a rare and diagnostically challenging benign tumour that should be considered in the differential diagnosis of pelvic masses, particularly in women without uterine involvement.

This case contributes valuable insight into the clinical presentation, diagnostic workup, and multidisciplinary management strategies for retroperitoneal leiomyoma, advancing understanding and guiding future care for this uncommon entity.

Author contribution

Concept and design: ST, BT; Literature search- ST, SS, AS, BS; Data collection: ST, SS, AS, BS; Data analysis: ST, SS, AS, BS; Draft manuscript: All; Final manuscript and accountability: All

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Conflict of interest

None

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Consent

All the appropriate patient consents have been taken in the form of verbal and written. In the consent form, the patient gave consent for her images and other clinical information to be reported in the journal. The patient was counselled that her name and initials would not be published and due efforts would be made to conceal the identity, but anonymity cannot be guaranteed.

Supplementary material

The data and supplementary material that support the findings of this study are available from the corresponding author upon reasonable request.

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