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Case Report

A rare case of epididymal leiomyoma presenting as a chronic hemiscrotal swelling: Multimodal imaging and histopathological correlation ☆

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ABSTRACT

Epididymal leiomyoma is an exceptionally rare benign neoplasm originating from the smooth muscle of the epididymis. Due to its rarity and nonspecific clinical presentation, it poses significant diagnostic challenges. This case report describes a 50-year-old male who presented with a painless, progressively enlarging swelling in the right hemiscrotum over 3 years. Physical examination revealed a firm, nontender, well-demarcated swelling separate from the right testis. The initial ultrasound demonstrated a heterogeneous hyperechoic lesion with minimal vascularity on Doppler imaging, and a mild hydrocele was also noted. Further evaluation using contrast-enhanced CT revealed a heterogeneously enhancing paratesticular mass arising from the epididymis, with the right testis unaffected. The patient underwent a right-sided high inguinal orchidectomy for definitive management. Histopathological examination confirmed the diagnosis of leiomyoma, revealing interlacing fascicles of spindle cells characteristic of smooth muscle origin without evidence of malignancy. The postoperative period was uneventful, and the patient was discharged with instructions for regular follow-up. This case underscores the importance of a comprehensive diagnostic approach combining advanced imaging techniques and histopathological evaluation to accurately diagnose rare epididymal tumors. Surgical excision not only provides a therapeutic resolution but also facilitates definitive diagnosis. Awareness of such rare entities is critical for clinicians to differentiate them from other paratesticular masses, particularly malignant ones. This report adds to the limited literature on epididymal leiomyoma and highlights the need for multidisciplinary collaboration in managing such rare cases.

☆ Competing Interests: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Background

Leiomyomas are benign mesenchymal tumors originating from smooth muscle cells and are most frequently encountered in organs with abundant smooth muscle, such as the uterus, gastrointestinal tract, and skin [1]. Their occurrence in the epididymis, a structure predominantly composed of connective tissue and ductal epithelium, is exceedingly rare, accounting for less than 0.5% of all paratesticular tumors [2,3]. Due to their rarity, epididymal leiomyomas often pose diagnostic challenges and may be misdiagnosed as other benign or malignant paratesticular masses, such as lipomas, adenomatoid tumors, or sarcomas [4].

Clinically, epididymal leiomyomas typically present as a painless, slow-growing scrotal mass often discovered incidentally. Symptoms are generally nonspecific, and patients may remain asymptomatic for prolonged periods, as in the current case, where the lesion remained undiagnosed for 3 years. These tumors are benign, but accurate diagnosis is crucial to differentiate them from malignant lesions, which require more aggressive management [5,6].

Diagnostic imaging plays a pivotal role in evaluating scrotal and paratesticular masses. Ultrasound is the first-line imaging modality, given its accessibility, cost-effectiveness, and ability to characterize the internal architecture of scrotal lesions [7]. On Doppler imaging, epididymal leiomyomas are typically visualized as well-defined, hypoechoic, or heterogeneous masses with low vascularity. However, findings are often nonspecific, necessitating advanced imaging techniques for further evaluation. Contrast-enhanced computed tomography (CT) and magnetic resonance imaging (MRI) provide additional anatomical and vascular information, aiding in preoperative planning and differentiation of benign from malignant lesions [8].

Histopathological examination remains the cornerstone of definitive diagnosis. Leiomyomas are composed of interlacing fascicles of spindle cells with eosinophilic cytoplasm and elongated nuclei, characteristic of smooth muscle origin. Immunohistochemistry can further confirm the diagnosis by demonstrating smooth muscle markers, such as smooth muscle actin (SMA) and desmin [1]. Surgical excision is the treatment for epididymal leiomyomas, as it allows both diagnostic confirmation and therapeutic resolution. A high inguinal orchidectomy is often performed to ensure complete excision and to rule out malignancy. The prognosis is excellent, with minimal risk of recurrence or complications following surgery. However, the rarity of this condition necessitates reporting such cases to enhance clinical understanding and guide future management [9].

Case presentation

A 50-year-old male presented to the surgical outpatient department with a history of swelling in the right hemiscrotum for the past 3 years. The swelling was insidious in onset and had progressively increased in size over time. The patient denied experiencing any associated pain, discharge, redness, trauma, or fever. He did not report any urinary symptoms or systemic complaints. No significant medical, surgical, or family history was relevant to his presentation.

On physical examination, the swelling was confined to the right hemiscrotum. It was firm in consistency, nontender, and separate from the right testis, which was palpable and normal in size and texture. There were no signs of inflammation, and the overlying skin appeared unremarkable. The left hemiscrotum, including the testis and epididymis, was normal.

To further evaluate the swelling, an ultrasound of the scrotum was performed. It revealed a heterogeneously hyperechoic, well-defined solid lesion measuring approximately 6.7 × 6.3 cm in the right paratesticular region. The lesion demonstrated a characteristic whorl pattern and showed minimal vascularity on Doppler imaging. A mild hydrocele was also observed in the right hemiscrotum, while the right testis was noted to be separate from the lesion. The left testis appeared normal in structure and echogenicity Figure 1.

Subsequently, a contrast-enhanced CT (CECT) scan of the pelvis was performed to further delineate the lesion and evaluate its relationship with surrounding structures. The scan revealed a heterogeneously enhancing soft tissue mass lesion within the right scrotal sac from the epididymis. The lesion was separate from the right testis, which was normal in ap-

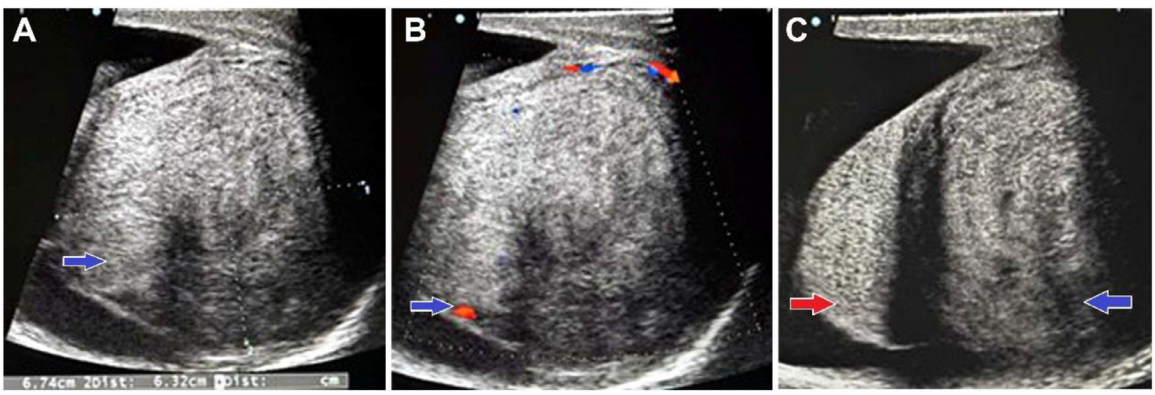

Fig. 1 – Ultrasound of the scrotum demonstrating a heterogeneously hyperechoic solid lesion in the paratesticular region of the right hemiscrotum with minimal vascularity on Doppler imaging (blue arrows). The right testis appears normal (red arrow).

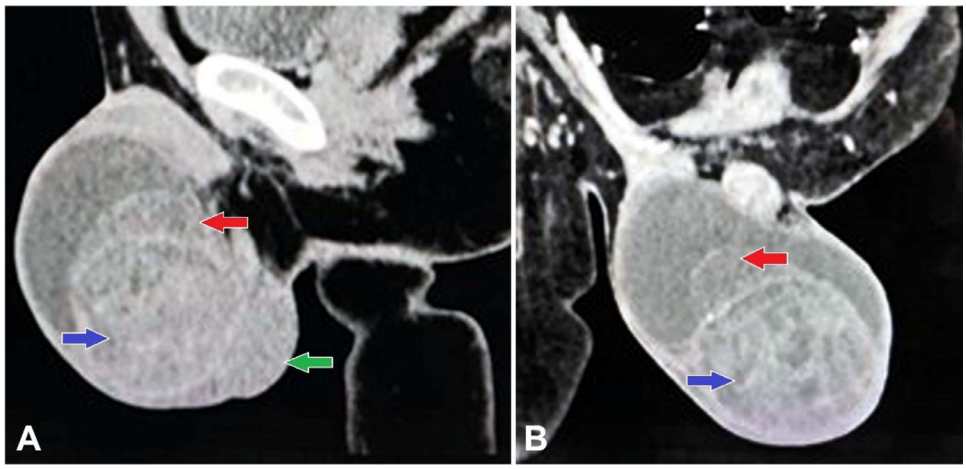

Fig. 2 – Contrast-enhanced computed tomography (CECT) of the pelvis in sagittal (A) and coronal (B) views revealing a heterogeneously enhancing mass lesion in the right paratesticular region (blue arrow) accompanied by a surrounding hydrocele. The right testis is visualized separately (red arrow), and the left testis appears normal (green arrow).

pearance. Mild hydrocele was confirmed on the imaging. The left testis was unremarkable Figure 2.

Based on the imaging findings, the patient was diagnosed with a paratesticular mass likely originating from the epididymis. Surgical intervention was planned, and the patient underwent a right-sided high inguinal orchidectomy. The surgical procedure was uneventful, and the specimen was sent for histopathological examination.

Histopathological evaluation of the excised mass confirmed the diagnosis of leiomyoma. Microscopically, the tumor was composed of interlacing fascicles of spindle cells with eosinophilic cytoplasm, consistent with smooth muscle differentiation. No evidence of malignancy was identified. Postoperatively, the patient had an uneventful recovery and was discharged with advice for regular follow-up.

This case highlights the importance of a thorough diagnostic workup in evaluating scrotal masses, including imaging and histopathology. The rarity of epididymal leiomyoma emphasizes the need for clinical awareness and a multidisciplinary approach to its diagnosis and management.

Discussion

Epididymal leiomyoma is an exceptionally rare benign tumor originating from the smooth muscle of the epididymis. Leiomyomas are most commonly seen in the uterus, gastrointestinal tract, and skin, making their occurrence in the epididymis highly unusual [10]. The rarity of this tumor and its nonspecific presentation, typically as a painless scrotal swelling, often lead to diagnostic challenges. Most reported cases, including this one, involve patients presenting with long-standing, progressively enlarging scrotal masses, necessitating a thorough diagnostic evaluation to distinguish them from more common paratesticular lesions such as adenomatoid tumors, sarcomas, and testicular malignancies [11].

Role of imaging

Imaging plays a pivotal role in the initial evaluation of epididymal masses. High-frequency ultrasonography (USG) is often the first-line modality for assessing scrotal swellings. In this case, USG revealed a well-defined, heterogeneously hyperechoic lesion with a characteristic whorl-like appearance and minimal vascularity on Doppler imaging. This imaging pattern, although nonspecific, is commonly associated with benign lesions [12]. Additionally, the ultrasound showed the lesion as distinct from the testis, aiding in ruling out testicular origin. Color Doppler imaging was particularly useful in assessing vascularity, which can help differentiate benign from malignant tumors, as malignant lesions often exhibit increased vascularity [13].

Complementary imaging modalities, such as contrast-enhanced computed tomography (CECT), further characterize the lesion. In this patient, CECT confirmed the paratesticular origin of the mass and demonstrated its separation from the testis, a critical finding that further supported the benign nature of the lesion. The imaging findings were consistent with other reported cases of epididymal leiomyoma and highlighted the utility of cross-sectional imaging in surgical planning [14]. Though not utilized in this case, MRI has been shown in previous studies to provide superior soft tissue contrast, making it an invaluable tool for the detailed evaluation of complex paratesticular lesions [15].

Histopathological evaluation

The definitive diagnosis of epididymal leiomyoma requires histopathological examination. In this case, the tumor exhibited the classical microscopic features of leiomyoma, including interlacing fascicles of spindle cells with eosinophilic cytoplasm. These features indicate smooth muscle differentiation, and the absence of atypia, necrosis, or mitotic activity confirmed its benign nature. Immunohistochemical staining with markers such as smooth muscle actin (SMA) and

desmin, which are highly specific for smooth muscle tumors, can further support the diagnosis when required [16]. However, the diagnosis was straightforward in this case, and additional staining was unnecessary.

Management and prognosis

The treatment of epididymal leiomyoma involves surgical excision, with high inguinal orchidectomy being the most common approach. This method ensures complete tumor removal and provides tissue for definitive diagnosis. In this case, the patient underwent a high inguinal orchidectomy, which was curative. No complications were reported postoperatively, and the patient's recovery was uneventful. Given the benign nature of leiomyomas, recurrence is exceedingly rare following complete excision, and the long-term prognosis is excellent [17].

Clinical significance

This case underscores the importance of considering epididymal leiomyoma in diagnosing paratesticular masses. Misdiagnosis can lead to unnecessary interventions or delayed treatment. Furthermore, the rarity of this entity highlights the need for clinical awareness among surgeons, radiologists, and pathologists. Comprehensive imaging and histopathological evaluation are essential to establish a diagnosis and guide appropriate management. This case adds to the limited literature on epididymal leiomyoma and emphasizes the value of multidisciplinary approaches in the diagnosis and treatment of rare scrotal tumors [18].

Conclusion

Epididymal leiomyoma is an exceedingly rare benign neoplasm that presents a diagnostic challenge due to its nonspecific clinical features and resemblance to other paratesticular masses. This case highlights the importance of a multidisciplinary approach involving detailed imaging and histopathological evaluation for accurate diagnosis. Ultrasound and CT imaging provided critical insights into the lesion's characteristics and origin, while histopathological analysis confirmed its benign nature. Surgical excision via high inguinal orchidectomy remains the definitive treatment, ensuring both diagnostic clarity and therapeutic resolution. Awareness of this rare entity is essential for clinicians to avoid misdiagnosis and unnecessary interventions. This report underscores the value of integrative diagnostic methods and contributes to the limited literature on epididymal leiomyoma.

Patient consent

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

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