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CASE REPORT

Rare Paratesticular Tumor of the Scrotum: A Case of Well-Differentiated Liposarcoma

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Abstract

Paratesticular liposarcoma is an exceedingly rare malignant neoplasm accounting for less than 12% of all liposarcoma. We present a 69-year-old male with a progressively enlarging, painless left scrotal mass over three months. Physical examination revealed an 18 cm firm mass, and imaging demonstrated a heterogeneous lesion with mixed signal intensity. The patient underwent radical orchidectomy with wide local excision. Histopathological examination confirmed well-differentiated liposarcoma measuring 22 × 19 cm, with immunohistochemical analysis showing positive MDM2 and CDK4 staining. The patient remained disease-free at 24-month follow-up without adjuvant therapy, emphasizing the curative potential of complete surgical excision for this rare entity.

Keywords: paratesticular liposarcoma, well-differentiated liposarcoma, orchidectomy, scrotal mass, rare case report

INTRODUCTION

Paratesticular liposarcoma represents an exceedingly rare malignant neoplasm arising from mesenchymal tissues surrounding the testis, accounting for less than 12% of all liposarcomas (1,2). Well-differentiated liposarcoma constitutes the most common histological subtype according to the 2020 WHO classification, characterized by mature adipose tissue with scattered atypical stromal cells (3). Fewer than 200 cases have been documented worldwide, predominantly affecting patients in the fifth to seventh decades of life (2).

Clinical presentation typically involves a painless, slowly enlarging scrotal mass that may be misdiagnosed as benign conditions due to its indolent nature (3,4). Standardized diagnostic and therapeutic guidelines remain elusive due

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to the condition's rarity, creating significant management challenges (2). Comprehensive magnetic resonance imaging characteristics are rarely documented, limiting radiological diagnostic criteria (5).

Prognosis varies considerably by histological subtype, with well-differentiated variants showing excellent outcomes following complete excision, contrasting sharply with aggressive dedifferentiated forms (6). Radical orchidectomy with wide local excision represents the cornerstone of curative treatment (1,7).

We present a rare case of giant well-differentiated paratesticular liposarcoma with detailed clinical, radiological, pathological, and follow-up findings, highlighting the diagnostic challenges and favorable outcome after complete surgical excision, thereby contributing to the limited literature on this uncommon entity.

CASE PRESENTATION

A 69-year-old male patient presented to our urology department with a 3-month history of a progressively enlarging, painless left scrotal mass. The patient reported no associated symptoms such as pain, urinary complaints, or systemic symptoms. His medical history was unremarkable, with no previous history of testicular trauma, cryptorchidism, or family history of testicular malignancies. The patient denied any previous radiation exposure or use of immunosuppressive medications.

Physical examination revealed significant left hemiscrotal asymmetry with a large, firm, non-tender, and fixed mass measuring approximately 18 cm in its greatest dimension. The mass caused visible distension of the scrotal skin, while the contralateral right testis appeared normal in size, consistency, and position (Figure1a). Palpation confirmed the mass to be separate from the testicular parenchyma, suggesting a paratesticular origin. No inguinal lymphadenopathy was detected bilaterally, and abdominal examination was unremarkable. Informed consent was obtained from the patient for publication of this case report and accompanying images.

Laboratory investigations included serum tumor markers, which demonstrated normal levels of alpha-fetoprotein, beta-human chorionic gonadotropin, and Lactate Dehydrogenase (LDH). Complete blood count, liver function tests, and renal function parameters were within normal limits.

Scrotal ultrasonography revealed a large, heterogeneous, hyperechoic solid mass measuring 7.5 × 18.5 cm, adjacent to the left testis with preserved testicular parenchyma. Color Doppler examination showed minimal internal vascularity within the mass. Based on the imaging characteristics, an initial radiological diagnosis of liposarcoma was suspected. Pelvic magnetic resonance imaging confirmed a large heterogeneous mass with mixed signal intensity components on both T1 and T2-weighted sequences. Although no significant pathological enhancement was observed after gadolinium administration, the imaging features raised strong suspicion for malignancy (Figure1b).



Figure 1a. Marked left hemiscrotal asymmetry with a large mass, **1b.** Pelvic magnetic resonance imaging shows a large mass lesion (red arrow) with heterogeneous signal intensity located in the left scrotum, the testicle (blue arrow).

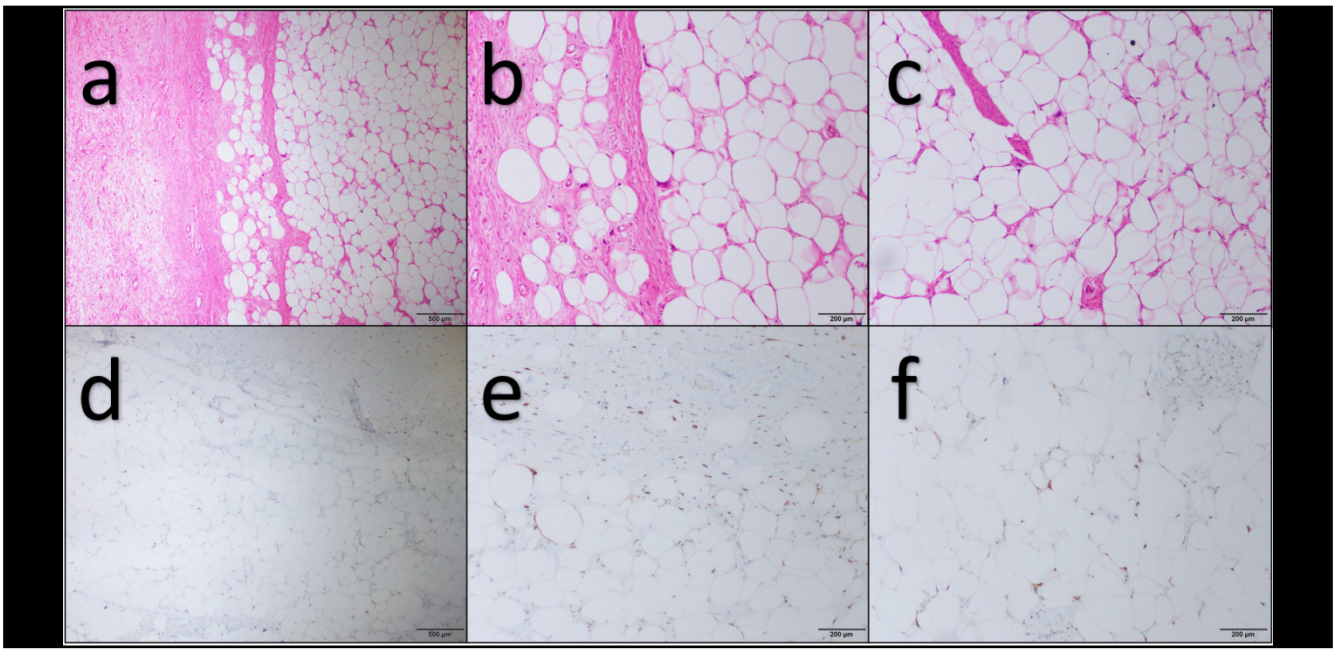


Figure 2a,b,c. Neoplastic proliferation composed predominantly of mature adipocytes of variable size, 2 d S100 positivity within adipocytic cells, **2e.** Nuclear MDM2 and 2f. CDK4 positive tumor cells.

Preoperative staging with contrast-enhanced computed tomography of the chest, abdomen, and pelvis revealed no evidence of metastatic disease. The patient underwent left inguinal exploration with radical excision of the paratesticular mass and left orchidectomy.

Gross examination revealed a well-circumscribed but non-encapsulated, lobulated mass with a yellowish-white cut surface and soft to partially firm consistency, adjacent to the orchidectomy specimen. The cut surface demonstrated a heterogeneous appearance with focal fibrous areas.

Microscopic examination showed a neoplastic proliferation composed predominantly of mature adipocytes of variable size, separated by thick fibrous septa. These septa contained scattered atypical stromal cells characterized by enlarged, hyperchromatic, irregular nuclei. Occasional multinucleated atypical cells and focal lipoblastic differentiation were identified. Mitotic activity was low, and no areas of tumor necrosis were observed. The tumor did not invade the testicular parenchyma or epididymis but demonstrated limited extension into the surrounding soft tissues. Surgical resection margins were free of tumor (Figure2a-c).

Immunohistochemical analysis demonstrated nuclear positivity for MDM2 and CDK4 in tumor cells. S-100 protein showed focal positivity within adipocytic components, while desmin and smooth muscle actin were negative (Figure2 d-f). Based on the histomorphological features and immunohistochemical profile, the findings were consistent with a diagnosis of well-differentiated liposarcoma.

Postoperative recovery was uneventful, and the patient was discharged on the third postoperative day. Given the complete excision with negative margins and the well-differentiated histological subtype, adjuvant therapy was not indicated. During a 24-month follow-up period, serial clinical examinations and computed tomography scans showed no evidence of local recurrence or distant metastases, with the patient remaining in complete remission.

DISCUSSION

Our 69-year-old patient falls within the typical age range for paratesticular liposarcoma, which predominantly affects patients in the fifth to seventh decades of life. This demographic pattern is consistent with similar cases, including a 75-year-old patient described (1) and a 73-year-old patient reported (2). Well-differentiated histological subtypes appear to have a predilection for older patients, whereas dedifferentiated variants may present at younger ages (7), as illustrated by the 62-year-old patient with giant dedifferentiated liposarcoma reported (8).

The left-sided presentation aligns with several documented cases (8,9). Radical left inguinal orchidectomy with wide local excision proved optimal, evidenced by our patient's excellent 24-month disease-free survival. This surgical strategy is strongly supported by literature, with reports indicating that "radical orchidectomy with wide local excision comprises the cornerstone of treatment" (1,7). The importance of complete excision cannot be overstated, given the potential for local recurrence in cases with inadequate surgical margins.

The role of adjuvant therapy in paratesticular liposarcoma remains controversial due to the rarity of the disease. Broadly speaking, complete surgical excision with negative margins is considered sufficient treatment for well-differentiated tumors, whereas adjuvant radiotherapy may be considered in selected patients with positive surgical margins, recurrent disease, or high-grade histological subtypes (2,9). The benefit of chemotherapy is not clearly established and is generally reserved for advanced or metastatic disease (2,6). Since our patient had a well-differentiated tumor with negative surgical margins and no evidence of metastasis, adjuvant treatment was not indicated, contrasting sharply with aggressive dedifferentiated forms, as illustrated by a reported case of pulmonary metastasis resulting in death within 22 months (6).

The comprehensive MRI documentation contributes valuable information to limited literature on radiological characteristics. While this study demonstrated MRI as "the more sensitive and accurate imaging modality" for paratesticular masses (5), detailed MRI features specific to liposarcoma remain rarely documented. Our case indicates that characteristic mixed signal intensity without significant enhancement, correlating with well-differentiated histological subtype. Molecular pathogenesis remains poorly understood, as Prakash et al. (2) noted that "due to the rarity of this disease, there are no standardized guidelines". Positive CDK4 nuclear staining supports current WHO 2020 classification criteria (3), providing molecular confirmation of our diagnosis.

CONCLUSION

Well-differentiated paratesticular liposarcoma is a rare malignancy that should be considered in the differential diagnosis of painless scrotal masses. Radical inguinal orchidectomy with complete surgical excision remains the primary treatment and is associated with favorable outcomes in patients with negative surgical margins. Reporting additional cases will help improve the understanding and management of this uncommon tumor.

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

Ethical Approval: This article does not contain any studies with human participants or animals performed by any of the authors Written informed consent was obtained from the patient for publication of this case report and any accompanying images. The procedures were in accordance with ethical standards and the Declaration of Helsinki.

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