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CASE REPORT

The rare quadruplet: seminoma, microlithiasis, epididymal cyst and varicocele: a case report

Khurram Khaliq Bhinder [1], **Maira Aslam** [1], **Suraya Bano** [1], **Zarnigar Khan** [1], **Muhammad Bilal** [2]

1: Department of Radiology, Shifa International Hospital, Islamabad, Pakistan
2: Department of Pathology, Shifa International Hospital, Islamabad, Pakistan

Email ✉: kkbhinder@yahoo.com

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ABSTRACT

Background: Seminomas account for nearly one-third of testicular germ cell tumors and are highly curable, with survival rates approaching 98% in early stages. The incidence of classic seminoma is rising in Pakistan. While the typical presentation is a painless testicular mass, diagnosis can be challenging when patients present misleading histories, such as scrotal trauma. Moreover, the coexistence of multiple testicular pathologies in a single patient is uncommon, further complicating the diagnostic process.

Case Presentation: We report the case of a 29-year-old male with a prior history of blunt scrotal trauma who presented with persistent swelling and ecchymosis. Ultrasound revealed multifocal hypoechoic intratesticular lesions with internal vascularity, alongside tubular ectasia of the rete testis, epididymal cysts, microlithiasis, and a left-sided varicocele. Tumor markers were largely within normal ranges. Frozen section during surgery suggested a neoplastic lesion, and left radical orchidectomy was performed. Histopathology confirmed multifocal classic seminoma (pT1a), limited to the testis with rete testis invasion, negative margins, and no lymphovascular invasion. Immunohistochemistry was positive for PLAP, CD117, and OCT3/4, supporting the diagnosis.

Conclusion: This case represents an uncommon scenario of multiple concurrent testicular pathologies coexisting with multifocal seminoma, initially masked by a history of trauma. It highlights the critical role of ultrasound as the first-line imaging modality, with definitive confirmation through histopathology and immunohistochemistry. Early surgical intervention remains the cornerstone of management, ensuring accurate diagnosis and favorable outcomes.

Keywords: Seminoma (MeSH); Rete Testes (MeSH); Testicular Neoplasms (MeSH); Varicocele (MeSH); Testicular Lesion (MeSH); Epididymal Cyst (MeSH); Spermatocele (MeSH).

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INTRODUCTION

About one-third of all testicular germ cell tumors are seminomas, which are among the most curable cancers, with survival rates of up to 98% in the early stages.[1] In recent years, the incidence of common subtypes such as classic seminoma has been increasing in Pakistan.[2] Seminomas typically present as a painless testicular mass, although extragonadal sites such as the mediastinum and retroperitoneum may rarely be involved.[3] Reported risk factors include testicular microlithiasis, undescended testis, positive family history, infections such as mumps, and a prior tumor in the contralateral testis. On imaging, testicular seminomas may mimic several neoplastic and non-neoplastic conditions, including segmental infarction, hematoma, cystic lesions, varicocele, and infections.[4] Tubular ectasia of the rete testis, for example, can resemble testicular neoplasm but is characterized by multiple cystic structures within the rete testis. Epididymal cysts typically appear as thin walled, septated cysts within the epididymal head.[5,6] Varicocele, on the other hand, represents abnormal dilation of the pampiniform plexus veins.[7] Testicular microlithiasis is also reported more frequently in germ cell tumors, particularly pure seminoma.[8] Radiological evaluations with ultrasonography remain the cornerstone of initial diagnosis, while histopathology provides definitive confirmation.

CASE PRESENTATION

A 29-year-old male presented to the urology outpatient department with complaints related to a prior scrotal injury. He reported blunt trauma to the scrotum two months earlier, followed by swelling and discoloration suggestive of hematoma formation. No medical attention was sought at the time of injury. On physical examination, residual ecchymosis was observed over the scrotal skin, consistent with a resolving soft tissue injury. No evidence of active bleeding or infection was present. Further evaluation was undertaken to exclude underlying testicular pathology.

Scrotal ultrasonography was advised. The right testis measured 28.7×12×35.5 mm (volume: 6.4 mL) with adequate vascular flow on color Doppler. Multiple tubular cystic anechoic structures without internal vascularity or mass effect were seen, consistent with tubular ectasia of the rete testis (Figure 1).

The right epididymal head contained a well-defined, septated cystic lesion measuring 6.3×17.4 mm, representing a complex cyst (Figure 2). No hydrocele or varicocele was noted on the right side.

The left testicle measured 32.7×15.5×35.9 mm (volume: 9.5 mL) with normal vascular flow. A well-defined, lobulated hypoechoic lesion with internal vascularity was identified, measuring 10.9×15.8×13 mm (volume: 1.2 mL), along with smaller adjacent lesions, the largest being 4.9×2.9 mm (Figures 3 & 4).

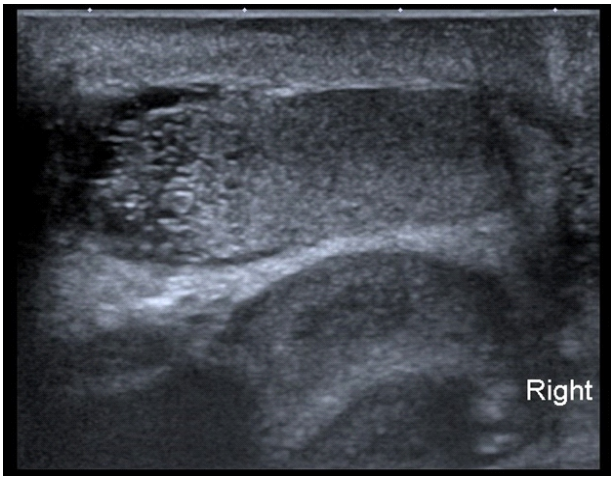

Figure 1: Right sided rete testes.

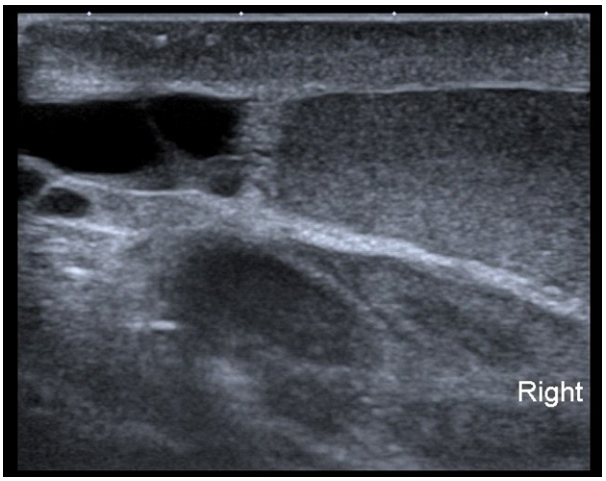

Figure 2: Right epididymal cyst.

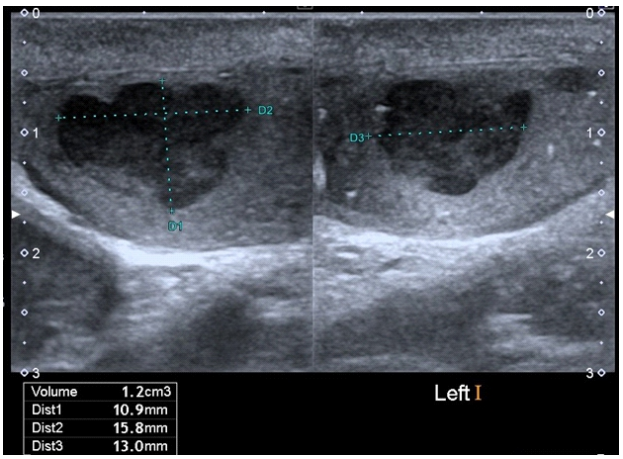

Figure 3: Left testicular seminoma (gray scale image).

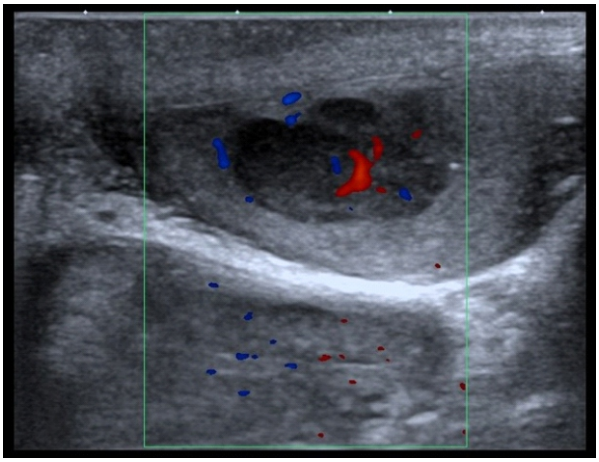

Figure 4: Left testicular seminoma (color doppler image).

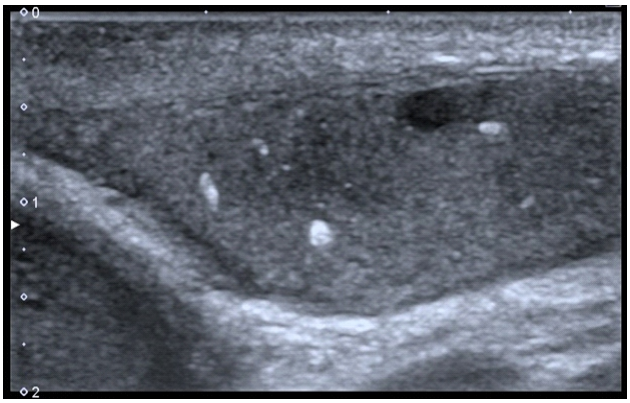

Figure 5: Left testicular microlithiasis.

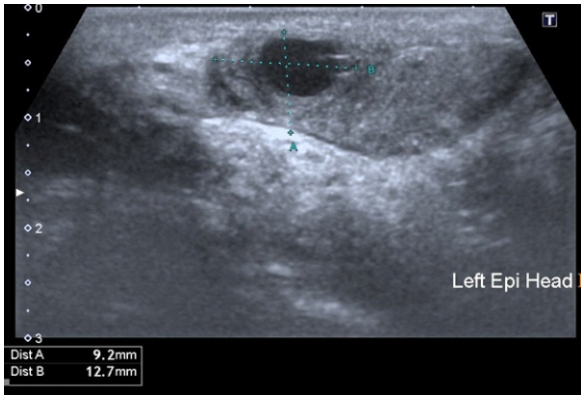

Figure 6: Left epididymal hypoechoic lesion.

Multiple hyperechoic foci without posterior acoustic shadowing were noted in the parenchyma, suggestive of testicular microlithiasis (Figure 5).

Epididymal head contained a well-defined hypoechoic area measuring 5.3 x7.4 mm (Figure 6). Additionally, a grade I left-sided varicocele with venous caliber up to 3 mm was observed, without hydrocele or para-aortic lymphadenopathy (Figure 7). A neoplastic etiology was suspected despite the misleading trauma history, and clinico-laboratory correlation was advised.

Urine routine examination was unremarkable, showing specific gravity of 1.010 (normal range: 1.005–1.025) and pH of 5.5 (normal: 5–8), with no protein, glucose, ketones, urobilinogen, bilirubin, blood, nitrites, red blood cells,

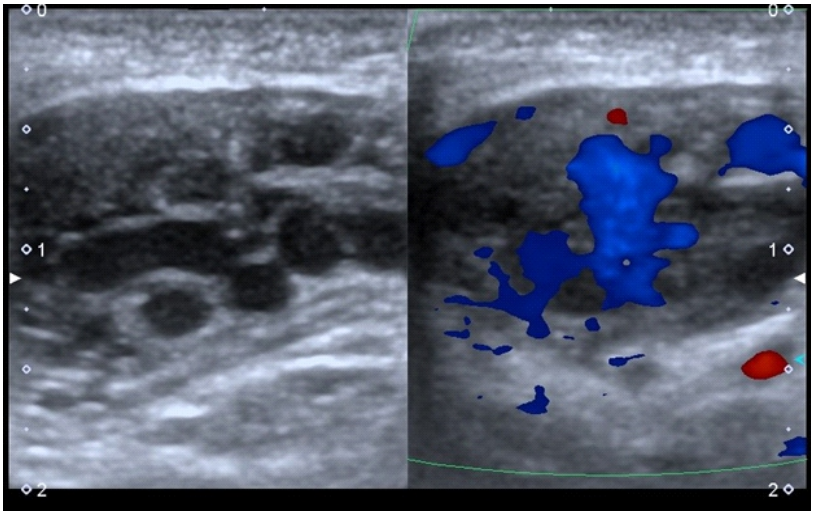

Figure 7: Left sided varicocele.

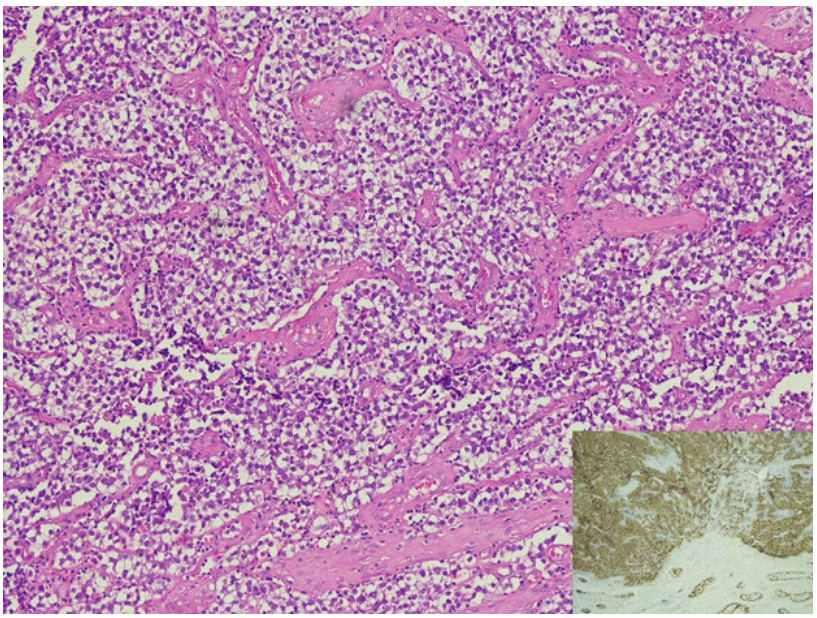

Figure 8: Seminoma showing fibrous septae and cells with clear cytoplasm H&E stain (10X magnification). Inset shows positive PLAP immunohistochemistry (4X magnification).

leukocytes, epithelial cells, yeast, or crystals. Lactate dehydrogenase (LDH) was mildly elevated at 975 mIU/mL (normal: 1.70–8.60 mIU/mL). Alpha-fetoprotein (AFP) was 3.3 ng/mL (normal ≤7.0 ng/mL). Serum LDH was 170 U/L (normal: 135–225 U/L). Beta-hCG was <0.20 mIU/mL (normal ≤5.0 mIU/mL). FSH was within the upper normal range at 11.10 mIU/mL (normal: 1.50–12.40 mIU/mL).

The patient was counseled for testicular surgery due to strong suspicion of neoplastic etiology raised by the radiology findings. A left inguinal incision was made, and the left spermatic cord was identified and secured with a non-crushing clamp. The left testis was mobilized from the scrotum into the inguinal canal. Frozen section biopsy was performed, with the specimen submitted fresh in a container labeled with the patient's name and surgical number. The specimen consisted of a small tan-white tissue fragment measuring 0.5 ×0.3×0.2 cm, submitted in a single chuck.

Frozen section findings were consistent with a neoplastic process, most likely seminoma. In view of the confirmed malignancy, a left-sided radical orchidectomy was performed. Subsequent large biopsy also supported the diagnosis. Two tumor nodules were identified, measuring 1.2×1.0×0.6 cm and 0.6×0.5 cm, respectively. The second specimen, received in formalin and labeled with the patient's name and surgical number, consisted of a left orchidectomy specimen weighing 25 g. The spermatic cord measured 8.0×3.0 ×1.0 cm, the epididymis 3.5×2.0 cm, and the testis 3.5×2.5×2.0 cm. The specimen was painted black and sectioned, revealing a round-to-ovoid, tan-white nodule measuring 1.2×1.0× 0.6 cm, located 0.2 cm from the capsule and 1.2 cm from the rete testis.

An additional smaller lesion, measuring 0.6×0.5cm, was identified approximately 8 mm from the primary nodule. The rete testis demonstrated a suspicious area measuring 0.9×0.7 cm. Histopathology confirmed seminoma, with the tumor confined to the testis and showing rete testis invasion. No evidence of lymphovascular invasion was observed, and all surgical margins were free of tumor. Pathological staging (pTNM) classified the tumor as mpT1a, indicating a neoplasm smaller than 3 cm in size, while the pN category could not be assigned as no lymph nodes were submitted or identified. Immunohistochemistry revealed strong positivity for PLAP, CD117, and OCT3/4 in both the tumor and GCNIS, whereas CD30, CKA1/AE3, and CD34 were negative for invasive disease (Figure 8).

DISCUSSION

Seminoma is the most common testicular germ cell tumor, usually presenting as a painless mass in young men. In this case, a misleading history of scrotal trauma initially suggested benign pathology, yet ultrasonography and histopathology confirmed multifocal seminoma with coexisting microlithiasis, rete testis ectasia, epididymal cyst, and varicocele. This rare combination underscores the need to suspect malignancy even in trauma

cases, as both conditions may coexist and obscure diagnosis.

Testicular trauma is a common indication for scrotal ultrasonography, where clinicians generally anticipate trauma-related findings. However, such an approach risks overlooking underlying malignant pathology that may coexist with or masquerade as traumatic injury. This case underscores the reality that clinical presentations do not always conform to textbook descriptions, and trauma and tumor can occur simultaneously.

Due to the location and mobility of the testes, scrotal trauma accounts for less than 1% of all traumatic injuries.[9] Typical trauma-related sonographic findings include testicular rupture, hematoma, avulsion, and epididymal injuries.[10] Therefore, in addition to history and clinical examination, detailed scrotal ultrasound with Doppler evaluation is strongly recommended for accurate diagnosis.[9]

Testicular cancer, particularly seminoma, is most often encountered in young males. Seminoma is the most common subtype and is notable for its favorable prognosis and radiosensitivity. Several risk factors have been identified, with prior germ cell tumor, family history, and cryptorchidism being the most frequent.

Seminomas typically present as hypoechoic, homogeneous testicular masses, with calcifications being an uncommon finding.[11] Although testicular microlithiasis may be observed in association with testicular cancers, current evidence does not establish a definite causal relationship.[12] Varicocele, present in approximately 15% of healthy males, has been consistently linked to a significant risk of infertility.[13]

Ultrasound remains the first-line imaging modality for scrotal evaluation because of its accessibility, non-invasive nature, absence of ionizing radiation, and high soft tissue resolution. It enables real-time visualization of the testes, epididymis, and adjacent structures. Most scrotal lesions, whether neoplastic or non-neoplastic, can be reliably characterized on ultrasound, making it an essential component of the initial diagnostic workup.[14]

In the setting of trauma, ultrasound mimickers of seminoma include segmental infarction and intratesticular hematoma. A thorough understanding of imaging features is essential to raise suspicion for malignancy. Segmental infarcts are usually wedge-shaped, but when they appear round, they may closely resemble seminomas. In such cases, color Doppler can aid differentiation, as seminomas typically demonstrate increased vascularity compared to infarcts.[15] Intratesticular hematomas, on the other hand, evolve in appearance over time and usually decrease in size, helping distinguish them from neoplastic lesions.[16]

Our case demonstrated an intratesticular hypoechoic mass that was ultimately confirmed as seminoma in the context of trauma, accompanied by testicular microlithiasis. In addition, bilateral epididymal cysts and rete testis ectasia, commonly seen as isolated findings-were present simultaneously, creating a distinctive combination of pathologies. Furthermore, the absence of elevated tumor markers provided additional supportive evidence, further highlighting the unusual nature of this case.

This case underscores the often-overlooked fact that clinical history can sometimes be misleading, and the imaging features of testicular seminoma and its mimickers must always be carefully considered. Even in seemingly incongruent clinical settings, any suspicion of malignancy should prompt further evaluation, as early recognition can have a significant impact on patient clinical outcomes.

CONCLUSION

The coexistence of multiple testicular pathologies in a single patient is exceptionally rare and can pose considerable diagnostic challenges, particularly when the history is misleading. This case highlights a unique presentation of multifocal seminoma with microlithiasis, epididymal cysts, and rete testis ectasia in the context of trauma. Such unusual combinations emphasize the importance of careful imaging interpretation and histopathological confirmation to ensure timely diagnosis and management.

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AUTHORS' CONTRIBUTION

The Following authors have made substantial contributions to the manuscript as under:

KKB, MA, SB, ZK & MB: Identification, diagnosis and management of the case, drafting the manuscript, critical review, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest, whether financial or otherwise, that could influence the integrity, objectivity, or validity of their research work.

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DATA SHARING STATEMENT

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

ETHICAL CONSIDERATION

This case report was conducted in accordance with institutional ethical standards. Informed consent was obtained from patient for the publication of anonymized clinical details. All identifying information has been removed to maintain patient confidentiality.

KMUJ web address: www.kmuj.kmu.edu.pk
Email address: kmuj@kmu.edu.pk