

An embryological surprise in the inguinal canal: Deep epidermoid cyst mimicking spermatic cord pathology – A case report

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ABSTRACT

Epidermoid cysts are common benign lesions that typically arise from the skin and subcutaneous tissues; however, deep-seated inguinal epidermoid cysts are rare and may mimic spermatic cord pathology on imaging. We report a 23-year-old male presenting with left inguinal pain and swelling of 2-week duration. Magnetic resonance imaging demonstrated a well-defined cystic lesion along the spermatic cord showing T1 and T2 hypointensity, diffusion restriction, and no post-contrast enhancement, raising suspicion for an infected encysted hydrocele or spermatic cord abscess. Surgical exploration revealed a well-encapsulated deep inguinal cyst, which was excised completely. Histopathology confirmed an epidermoid cyst. This case highlights a diagnostic pitfall where diffusion restriction may mimic infection and emphasizes the importance of considering epidermoid cyst in the differential diagnosis of non-enhancing inguinal lesions.

Key words: Case report, Diffusion restriction, Epidermoid cyst, Inguinal region, Magnetic resonance imaging, Spermatic cord

Epidermoid cysts are benign lesions resulting from epidermal inclusion and are commonly encountered in superficial locations such as the scalp, face, neck, and trunk [1]. Inguinal involvement is uncommon and usually limited to superficial subcutaneous tissues. Deep-seated epidermoid cysts in the inguinal canal without cutaneous involvement are rare and sparsely described in the literature [2,3]. When located along the spermatic cord, these lesions may closely mimic conditions such as encysted hydrocele, spermatic cord abscess, or other cystic pathologies, leading to diagnostic ambiguity.

The rationale for reporting this case lies in highlighting a potential imaging pitfall – diffusion restriction in a non-infective lesion, resulting in misinterpretation as infection. Awareness of this entity is essential for radiologists to avoid diagnostic errors and guide appropriate management.

CASE PRESENTATION

A 23-year-old male presented with pain and swelling in the left inguinal region for approximately 2 weeks. There was no history of trauma, fever, urinary symptoms, or prior surgery.

The patient was afebrile with stable vital parameters. No systemic abnormalities were noted. A tender, well-defined swelling was palpated in the left inguinal region. The overlying skin was normal. Both testes were separately palpable and appeared normal.

Magnetic resonance imaging (MRI) of the pelvis and inguinal region was performed using multiplanar multisequence imaging, including T1-weighted, T2-weighted, fat-suppressed sequences, diffusion-weighted imaging with apparent diffusion coefficient (ADC) mapping, gradient-recalled echo (GRE) sequences, and post-contrast imaging. A well-defined cystic lesion measuring approximately $5.3 \times 4.3 \times 5.8$ cm was identified in the left inguinal region along the expected course of the spermatic cord (Fig. 1a). The lesion appeared mildly hypointense on T1-weighted images and hypointense on T2-weighted images (Fig. 1b). No signal suppression was observed on fat-suppressed sequences. Diffusion-weighted imaging demonstrated marked diffusion restriction with corresponding low ADC values (Fig. 2), consistent with dense keratinous content. No blooming was noted on GRE sequences. Post-contrast images showed no appreciable enhancement (Fig. 2). There was no communication with the peritoneal cavity, no extension into the scrotum, and no involvement of the ipsilateral testis. No significant surrounding inflammatory changes were identified. Based on imaging

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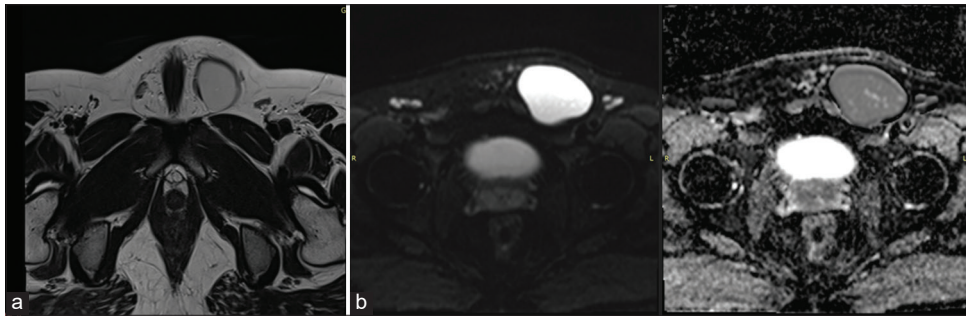


Figure 1: (a) Axial T2-weighted magnetic resonance imaging (MRI) image showing a well-defined hypointense cystic lesion within the left inguinal canal (arrow), located along the expected course of the spermatic cord; (b) diffusion-weighted MRI demonstrating marked diffusion restriction within the lesion (arrow), consistent with dense keratinous contents typical of an epidermoid cyst

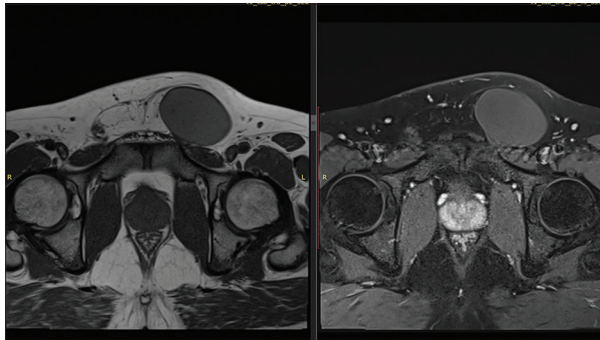


Figure 2: Post-contrast T1-weighted magnetic resonance imaging showing absence of internal enhancement within the lesion, suggesting a benign cystic nature

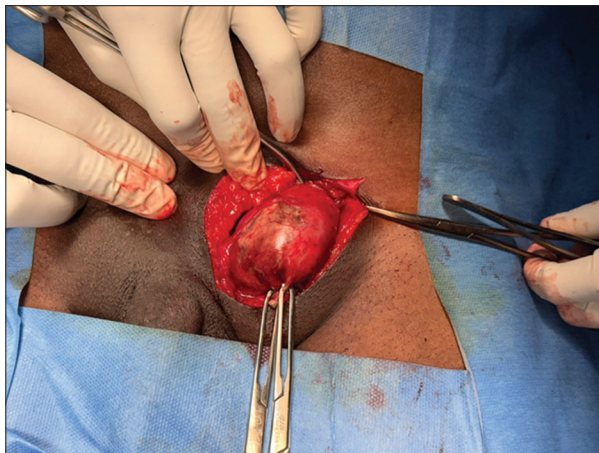


Figure 3: Intraoperative photograph demonstrating a well-encapsulated cystic lesion identified within the deep inguinal plane during surgical exploration

features and anatomical location, the primary radiological considerations included: an infected encysted hydrocele of the spermatic cord and spermatic cord abscess.

Fine-needle aspiration cytology was attempted; however, the sample was lost due to mishandling by a bystander, rendering the procedure non-diagnostic. Ultrasound-guided aspiration yielded minimal material and no symptomatic relief. Due to persistent symptoms and inconclusive findings, surgical exploration was performed.

Intraoperatively, a well-encapsulated, tense cystic lesion was identified in the deep inguinal plane (Fig. 3). The lesion was separate from the skin, testis, and peritoneal cavity. Complete excision was achieved.

Gross examination revealed pultaceous keratinous material within a thick-walled cyst, correlating with MRI findings. Histopathological examination revealed a cyst lined by stratified squamous epithelium containing keratinous debris, consistent with an epidermoid cyst. No evidence of malignancy was identified.

DISCUSSION

Epidermoid cysts are commonly encountered benign lesions; however, deep inguinal presentations are rare [1,2]. Proposed mechanisms include embryological sequestration of ectodermal elements and traumatic implantation [2,4]. A limited number of case reports have described deep epidermoid cysts mimicking inguinal or spermatic cord pathology [2,3,5]. These cases highlight the diagnostic challenge posed by atypical location and imaging overlap with infective conditions.

MRI characteristics of epidermoid cysts vary depending on keratin and protein content. Diffusion restriction is a characteristic feature due to dense keratin; however, it is not specific and may also be seen in abscesses and infected collections [3,6]. In this case, diffusion restriction combined with pain and inguinal location led to an initial suspicion of infection.

Differential diagnoses include: spermatic cord abscess, infected encysted hydrocele, dermoid cyst, necrotic lymph node, and cystic neoplasm. Key imaging clues favoring epidermoid cyst in this case included absence of post-contrast enhancement, lack of surrounding inflammatory changes, no systemic signs of infection, and no communication with the peritoneal cavity [7,8].

Previously reported cases have emphasized similar diagnostic dilemmas, particularly when diffusion restriction is present [3,5]. However, reports of deep inguinal epidermoid cysts mimicking spermatic cord infection remain extremely limited, making this case a valuable addition to existing literature.

CONCLUSION

Deep-seated epidermoid cysts of the inguinal region are rare and can closely mimic spermatic cord infections on MRI. Diffusion restriction, although characteristic, is

not specific and may lead to misdiagnosis. Recognition of ancillary imaging features, particularly lack of enhancement and absence of inflammatory changes, is crucial in avoiding diagnostic pitfalls. Surgical excision remains both diagnostic and curative.

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