

Testicular epidermoid cyst: a case report and review of the clinicopathologic features

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Epidermoid cysts of the testicle are rare, benign lesions that are clinically indistinguishable from malignant germ cell tumors. A scrotal mass in a 27-year-old man was

incidentally detected by his family physician, and confirmed to be intratesticular by ultrasound. Radical orchidectomy was performed revealing the pathologic diagnosis. The presentation, evaluation and management of epidermoid cysts are discussed.

Key Words: testicular neoplasms, epidermoid cyst, testis

Introduction

Epidermoid cysts account for less than 1% of testicular tumors,¹ and are found most commonly in males in their second through fourth decades of life.² Although generally considered to be benign lesions, case reports exist of epidermoid cysts having undergone malignant transformation and developing into seminomas.³ Radical orchidectomy allows for complete histologic examination and prevents the potential transformation to malignancy. We report a case of an epidermoid cyst with typical clinical, radiologic and pathologic findings.

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Case report

A 27-year-old white man presented with a painless, hard right testicular mass originally detected during the patient's annual physical examination. There was no history of scrotal trauma or cryptorchidism, and no family history of genitourinary malignancies. Ultrasound findings demonstrated a 2.9 cm x 2.3 cm x 2.2 cm sharply demarcated, heterogeneously hypoechoic, intratesticular mass with punctate calcification throughout the lesion and along its margins (Figure 1a). Doppler imaging revealed the lesion to be hypovascular and multifocal microlithiasis was detected in the contralateral testes (Figure 1b). The clinical and radiographic features were concerning for a germ cell tumor and surgical intervention was recommended. Pre-operatively, serum α -fetoprotein, β -human chorionic gonadotropin and lactate dehydrogenase were drawn and were within normal limits.

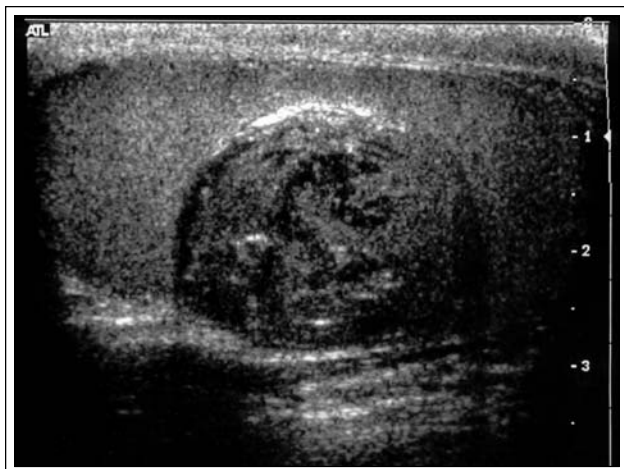


Figure 1a. Scrotal ultrasound depicting sagittal view of right testis demonstrating a hypoechoic intratesticular mass with a well-defined, hyperechoic cystic wall.

The patient underwent radical inguinal orchidectomy. Gross pathologic inspection demonstrated a cystic, well-circumscribed testicular mass. The cyst contained friable yellow contents. The mass was homogenous, with no areas of hemorrhage or necrosis. Adjacent testicular parenchyma was unremarkable Figure 2a. The cyst was generously sampled. Microscopic examination revealed a characteristic squamous epithelial lining surrounding a cystic space filled with keratin Figure 2b. There was no evidence of intratubular germ cell neoplasia or teratomatous elements.

Post-operative computed tomography (CT) scans of the chest, abdomen and pelvis did not reveal any abnormalities.

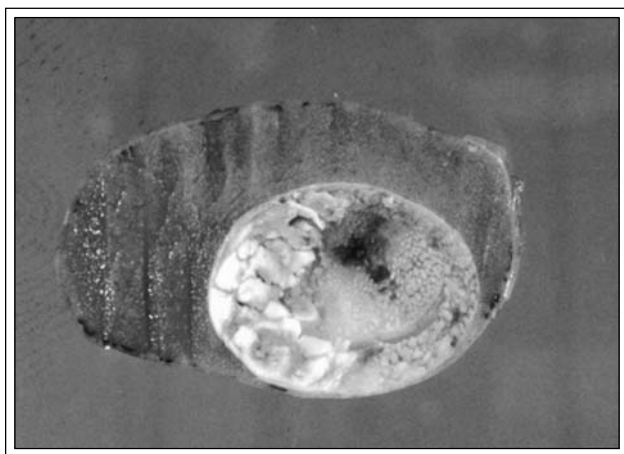


Figure 2a. Gross appearance of testis showing an inhomogenous intratesticular mass.

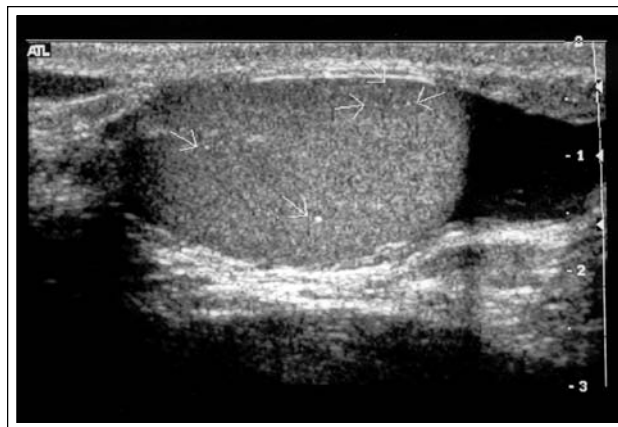


Figure 1b. Sagittal ultrasound view of the contralateral testis demonstrating microlithiasis.

Discussion

Epidermoid cysts are benign tumors of epithelial origin and are most commonly found within the central nervous system. Although rare, involvement of the spleen, pancreas, salivary glands and testis has been reported.⁴

The anatomic origin of testicular epidermoid cysts continues to be debated with potential sites including the tunica albuginea,⁵ the seminiferous tubular epithelium,² squamous metaplasia of the mesothelium, and the rete testis.⁶

The typical presentation is a painless testicular nodule palpated during physical examination, and in approximately 40% of cases, diffuse testicular enlargement is detected.² However, due to these



Figure 2b. Microscopic findings showing a cyst lined by stratified squamous epithelium, with keratinaceous contents (haematoxylin and eosin, magnification x100).

nonspecific signs and symptoms, further radiologic and pathologic investigations must be pursued to rule out malignant testicular neoplasms.

The clinical diagnosis of an epidermoid cyst of the testicle is supported by distinct sonographic characteristics. Features include a well-defined mass margined by a hyperechoic ring and alternating hypo- and hyperechogenicity. This pattern, dubbed the "onion ring" appearance, represents layers of compact keratin and desquamated squamous cells.⁷ Four sub-types of epidermoid cysts have been characterized based on ultrasonographic appearance: Type I, onion-ring pattern; Type II, densely calcified mass; Type III, cyst with peripheral or central calcification; and Type IV, demonstrating a mixed pattern.⁴ The avascular nature of testicular epidermoid cysts is demonstrated by the absence of contrast enhancement on MR imaging and the paucity of flow on color Doppler sonography.^{7,8}

Epidermoid cysts are keratin-filled cystic spaces surrounded by squamous epithelial cells. Intratubular germ cell neoplasia and teratomatous-type elements apart from squamous epithelium are markedly absent in these cystic structures.⁹ Recently, Younger et al discovered that epidermoid cysts possess similar genetic aberrations identified in malignant testicular germ cell tumors, including the loss of heterozygosity on chromosomes 9p, 12q and 17p13.⁹ Despite the neoplastic qualities of epidermoid cysts, their low frequency of loss of heterozygosity on the aforementioned chromosomes demonstrates the genetic differences from malignant germ cell tumors.

Testicular epidermoid cysts are commonly believed to represent a monolayer teratoma based on similar epidemiologic and clinical features. The similarity between epidermoid cysts and germ cell tumors is supported by the higher frequency of epidermoid cysts in Caucasians and peak age incidence of men in their twenties and thirties. Further evidence for this similarity is the higher frequency of epidermoid cysts in the right testis than in the left testis, and the history of cryptorchidism that infrequently accompanies an epidermoid cyst.²

To eliminate the possibility that other germ cell elements may be associated with the cystic structure, radical orchidectomy had remained the preferred method of treatment.¹⁰ More recently, however, increasing consideration has been given to tumor enucleation and biopsy of the adjacent parenchyma as adequate treatment of epidermoid cysts.¹¹ With respect to the aforementioned study where organ-sparing surgery was undertaken, the criteria for suspecting an epidermoid cyst included a

circumscribed, firm and smooth intratesticular mass on physical examination, and a well circumscribed hypoechoic mass with an echogenic rim and an echogenic center on testicular ultrasound.¹¹ Despite recommendations that orchidectomy may not be necessary for epidermoid cysts, surgical removal of the testes with pathologic analysis remains the gold standard of diagnosis and treatment. The pathologic diagnosis can then be accurately determined and the potential transformation of the lesion to a malignant state is eliminated.

Given the rarity of the lesion, no firm recommendations exist regarding the role of ongoing follow-up of these patients for development of metastatic disease at a later date due to malignant transformation. Although controversial, it would seem prudent to monitor patients with clinical examination and abdominal imaging on a semi-annual basis for several years. □

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