Conservative Surgery for Epidermoid Cyst of the Testis: A Case Report and Recent Literature Review

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Epidermoid cysts are rare benign tumors of the testes. We present a 24-year-old man who suffered from a right non-tender testicular mass for 1 year. Sonographic findings demonstrated a round, well-defined intraparenchymal lesion with a hyperechoic wall and hypoechoic center located in the lower pole. Doppler sonography revealed no evidence of blood flow within the mass. Serum α-fetoprotein (AFP), ß-human chorionic gonadotropin (ß-HCG), and lactate dehydrogenase levels were normal. A right epidermoid cyst of the testis was our impression preoperatively, and it was conservatively managed with intraoperative frozen sections providing confirmation. In addition, we review the recent literature and discuss the surgical management of this entity. (JTUA 19:242-4, 2008)

Key words: epidermoid cyst, testicular neoplasms, surgery.

INTRODUCTION

Epidermoid cysts of the testis are uncommon and account for 1.5%~2% of testicular tumors.¹ The right testicle is involved somewhat more frequently than the left testis.² Generally, most patients present with a painless nodule.² The histogenesis of epidermoid cysts is not completely understood, but most investigators suggest that these tumors are a monodermal development of a teratoma without evidence of malignancy.³ Because testicular epidermoid cysts are benign, a cure is possible if the mass is completely resected. Recently, organ-preserving surgery has become favored over the traditional inguinal orchiectomy.¹,² Herein, we present a case of an epidermoid cyst and review the diagnosis and surgical management of this disease.

CASE REPORT

A 24-year-old man presented with a 1-year history of a right testicular mass noted by self-examination. Physical examination confirmed a 2 × 1.5-cm, hard, non-tender testicular mass. Sonographic findings demonstrated a round, well-defined intraparenchymal lesion with a hyperechoic wall and hypoechoic center, located in the lower pole. Doppler sonography revealed no evidence of blood flow within the mass (Fig. 1). Serum α-fetoprotein (AFP), ß-human chorionic gonadotropin (ß-HCG), and lactate dehydrogenase levels were normal. With the preoperative diagnosis of a epidermoid cyst or other benign lesion, the right testis was approached by a scrotal incision, and the mass was enucleated. Intraoperative frozen section revealed a well-encapsulated cyst filled with laminated layers of keratin and lined by squa-
mous epithelium which was consistent with an epidermoid cyst. A permanent section confirmed the diagnosis (Fig. 2). After 24 months of follow-up, the patient was stable without tumor recurrence.

DISCUSSION

An epidermoid cyst of the testis was first reported in 1942 by Dockerty and Priestly. Approximately 350 cases have been reported in the literature since then. The tumor frequently occurs in the second to fourth decades of life. Clinically, most patients are asymptomatic and discover a solitary, firm, non-tender testicular mass during self-examination or routine physical examination. Tumor markers, such as AFP and ß-HCG, are negative.

The radiological characteristics of epidermoid cysts of the testis have been described and correlate well with the histopathological findings. The sonographic features include a sharply defined mass with a hyperechoic rim and an "onion ring" appearance of alternating hypoechogenicity and hyperechogenicity representing layers of compacted keratin and desquamated squamous cells. Alternatively, a "target" or "bull's eye" pattern may be observed. In our case, an onion ring pattern was not detected. This may have been due to differences in the maturation, compactness, and quantity of keratins present within the epidermoid cyst. In addition, findings of an epidermoid cyst of the testis examined with Doppler sonography have rarely been described. Langer et al. described a lack of internal vascularity of epidermoid cysts. No internal flow signal within the lesion was also demonstrated in our case. A lack of internal vascularity may be another feature that can differentiate epidermoid cysts from most solid intratesticular lesions. Except for the onion ring configuration, other sonographic appearances might not be useful in differentiating epidermoid cysts from other germ cell tumors. However, when the preoperative sonographic findings suggest an epidermoid cyst, a negative tumor marker status and avascularity provide additional information to make an accurate preoperative diagnosis.

Magnetic resonance imaging (MRI) is another recently employed useful diagnostic tool. On MRI, the outer fibrous capsule, epithelial lining, and adjacent compact keratin produce a peripheral low signal intensity; the dense debris and calcification produce a central low signal intensity; and the desquamated cellular debris containing both high water and lipid contents produces a mid zone of high signal intensity on both T1- and T2-weighted images.

The pathologic diagnosis of epidermoid cysts is based on criteria proposed by Price: (a) the lesion must be cystic and intraparenchymal; (b) the lumen should contain keratin with no teratomatous elements or dermal adnexal structures such as sebaceous glands or hair follicles; (c) the walls of the cyst should be composed of fibrous tissue with a complete or incomplete inner lining of squamous epithelium; and (d) the remaining testicular parenchyma may be atrophic but must not contain teratomatous elements, in situ germinal tumors, or scarring.

The histogenesis of epidermoid cysts remains unclear, and there are several possibilities. The prevailing hypothesis is that of a germ cell origin, developing along the lines of epidermal differentiation as a monodermal expression of a teratoma. Recently, Dieckmann and Loy found that an epidermoid cyst of the testis may actually be a non-teratomatous benign tumor based on the absence of atypical intratubular germ cells (testicular intraepithelial neoplasia or carcinoma in situ) that are often detected in adjacent seminiferous tubules of adult patients with teratomas or germ cell tumors.

In spite of the fact that the cysts are of germ cell origin, there is no reported incidence of metastasis for simple epidermoid cysts of the testis treated conservatively with up to 37 years of follow-up. Furthermore, intraoperative frozen sections have high accuracy and specificity for differentiating malignant from benign tumors. Therefore, the surgical management of these benign lesions has changed in the past decade (Table 1) from the previously prevalent radical orchectomy procedure. Shah et al. reviewed 141 cases of epidermoid cysts reported between the years 1942 and 1981, and...
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found that 83% of cases underwent radical surgery.6 However, 38% and 39% of the epidermoid cysts operated on between the years 1969 and 1995 underwent testicular-sparing surgery.1,2 We reviewed the English literature between the years 1999 and 2004, and discovered that 75% of 88 cases received testis-sparing surgery.8-18 The evolution of the surgical approach of epidermoid cysts means that conservative surgery is more acceptable to most surgeons.

We share a case of a testicular epidermoid cyst with the features of Doppler sonography and reviewed the surgical managements to point out more-adequate procedures. In conclusion, epidermoid cysts of the testis are rare, benign lesions with no known metastatic potential. When the preoperative sonographic findings suggest an epidermoid cyst and intraoperative frozen sections confirm this, conservative testicular-sparing surgery may be preferable to an orchietomy.

REFERENCES


Table 1. Evolution of the surgical management of epidermoid cysts

<table>
<thead>
<tr>
<th>Authors</th>
<th>Period</th>
<th>No</th>
<th>TSS*</th>
<th>Orchiectomy</th>
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<tbody>
<tr>
<td>Shah et al.⁶</td>
<td>1942-1981</td>
<td>141</td>
<td>24(17%)</td>
<td>117(83%)</td>
</tr>
<tr>
<td>Dieckmann et al.¹</td>
<td>1969-1994</td>
<td>154</td>
<td>58(38%)</td>
<td>96(62%)</td>
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<tr>
<td>Heidenreich et al.²</td>
<td>1969-1995</td>
<td>318</td>
<td>122(39%)</td>
<td>196(61%)</td>
</tr>
<tr>
<td>Present review.⁸-¹⁸</td>
<td>1999-2004</td>
<td>88</td>
<td>66(75%)</td>
<td>22(25%)</td>
</tr>
</tbody>
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TSS, testicular-sparing surgery