Urology Case Reports 2 (2014) 13–15

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Oncology

Fibrous Pseudotumor of the Penis – An Unusual Finding During Repair of Fractured Penis

Sunny Nalavenkata [a,*], Matthew Winter [a], Justine Pickett [b], Maxwell Dias [a], Venu Chalasani [a,c]

[a] Department of Urology, Hornsby Ku-Ring-Gai Hospital, New South Wales, Australia
[b] Department of Pathology, Royal North Shore Hospital, New South Wales, Australia
[c] University of Sydney, Australia

ARTICLE INFO

Article history:
Received 2 December 2013
Received in revised form
11 December 2013
Accepted 11 December 2013

Keywords:
Coitus
Penis
Fracture
Fibrous pseudotumor
Fibroma

ABSTRACT

Fibrous pseudotumors of the testis and penis are a rare phenomenon, forming a spectrum of heterogeneous lesions. To the best of our knowledge, there has been only 1 previous report arising from the penis. We present a case of fibrous pseudotumor of the penis, incidentally found during the surgical repair of a fractured penis. These benign lesions have been described in the literature and are most commonly referred to as pseudotumors. They should be distinguished from potentially malignant lesions, including fibrosarcomas, squamous cell carcinoma, and polypoid urothelial carcinoma. Being aware of this pathology is important to prevent unnecessary radical surgery.

Introduction

Fibrous pseudotumors are exceedingly rare, benign fibroproliferative tumors, recognized first in 1904 by Balloch.[1] These typically ovoid, nodular lesions originate in the connective tissue of the tunics, making up 6% of all benign paratesticular tumors.[2] Most cases in the literature draw a distinction between nodular and diffuse thickening of the tunica. Including both forms, 75% of these tumors involve the tunica vaginalis but can also arise in the tunica albuginea, epididymis, and spermatic cord in rarer circumstances. Only rarely has it been described arising from the penis.[3]

The diffuse variant is termed fibromatous periorchitis and exhibits diffuse fibrosis of the tunics often encasing the testis reminiscent of malignancy.[2,4] Other terms referring to these lesions includes chronic proliferative periorchitis, reactive periorchitis, fibromatous periorchitis, inflammatory pseudotumor, proliferative funniculitis, nodular and diffuse fibrous proliferation of the tunica, fibroid growth of the cord, and fibromata of the cord. These terms partly reflect the variable and overlapping spectrum of pathologic findings and various etiologic theories.

Case presentation

A 19-year-old male patient presented 7 hours after sexual intercourse in which his penis had made heavy contact with his partner's perineum. He reported immediate pain, detumescence, swelling, and bruising.

On presentation to the emergency department, the patient had bruising and swelling at the base of his penis with mild deviation. The clinical diagnosis of fractured penis was made, and the patient was taken for surgical repair. The patient had no significant medical history; however, he reported a lump at the base of his penis that had been present since the age of 12 years. No obvious trauma occurred at that time, and the patient was unclear about the causation of this lump. Written informed consent was provided by the patient, with guarantees of confidentiality.

He underwent immediate surgical intervention. A circumferential incision was made below the glans penis, and dissection commenced to deglove the penis to expose the suspected penile fracture. During degloving, a mass of fibrous tissue approximately 20 × 3 mm was noted overlying a tear in the tunica albuginea (Fig. 1). Tethering of the lump to the tunica and overlying fascia made degloving particularly challenging. The lump was excised and sent

* Corresponding author. Tel.: +61-2-9477 9123; fax: +61-2-9477 2005.
E-mail address: sunny99@gmail.com (S. Nalavenkata).

2214-4420/
http://dx.doi.org/10.1016/j.eucr.2013.12.007

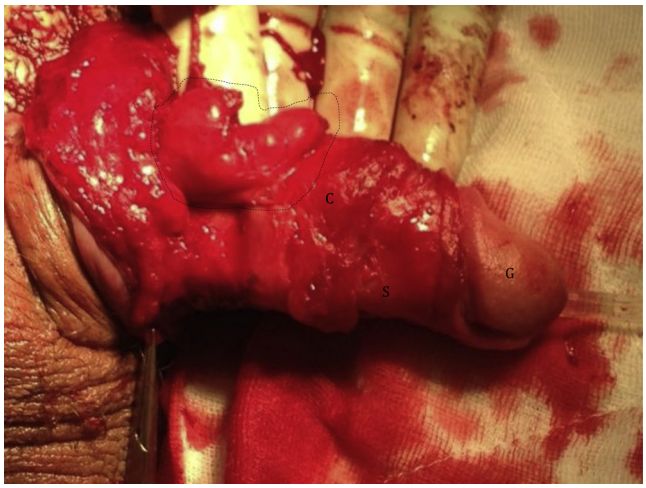

Figure 1. Mass of fibrous tissue (20 × 3 mm – outlined by dashed line) overlying tear in the tunica albuginea. C, corpus cavernosum; G, glans penis; S, corpus spongiosum.

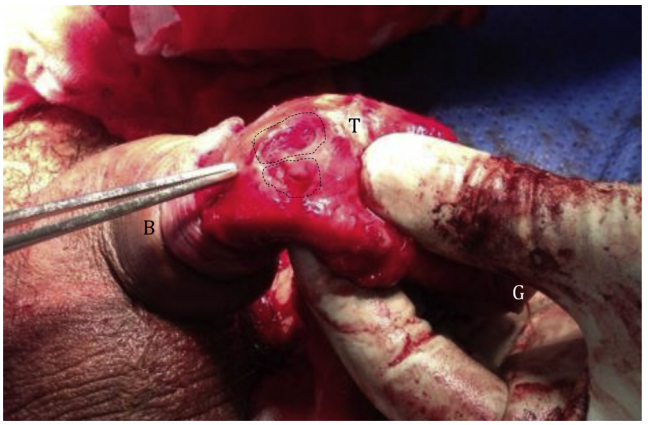

Figure 2. Tear in the tunica (dashed line) was identified after excision of lesion. B, base of penis; G, glans penis; T, tunica albuginea of corpus cavernosum.

for histopathology. The tear in the tunica was then identified and noted to be entirely separate to the excised lesion (Fig. 2). Subsequent surgical repair was undertaken with interrupted sutures.

The specimen consisted of a firm tan piece of tissue measuring 32 × 14 × 8 mm. Sectioning revealed a diffusely fibrotic mass with no focal lesions. Microscopy revealed a well-circumscribed margin around a hypocellular mass containing interspersed spindle-shaped cells and scattered blood vessels within a dense collagenous stroma (Fig. 3). There was no evidence of cytologic atypia, necrosis, or mitoses to suggest malignant behavior. Peripheral hemorrhage with scattered neutrophils was noted, likely in relation to the fracture-related inflammatory events. Immunohistochemical staining (Smooth Muscle Actin) highlighted staining (SMA) highlighted intralesional blood vessels, but there were no atypical features to suggest malignancy. These features were all in keeping with a diagnosis of incidental fibrous pseudotumor of the penis.

Discussion

Although the pathogenesis of these lesions is unclear, the cell of origin for fibrous pseudotumors appears to be the fibroblast or myofibroblast, which is further supported by immunohistochemical studies.[3] Although there is no consensus, it is generally accepted that these lesions represent a benign reactive proliferation of inflammatory and fibrous tissues, likely in response to inflammatory events. Fibrous pseudotumors typically present in the third or fourth decade of life as a painless mass or swelling often leading to suspicion of malignancy.[1] They rarely present in childhood.

Antecedent trauma or epididymo-orchitis has been demonstrated in only approximately 30% of cases, leaving most as clinically idiopathic in etiology. In this reported case, the patient noted the presence of the lump since the age of 12 years. Although the patient was uncertain about specific previous trauma, this lesion could certainly have arisen after a subclinical penile fracture. Although there have been no previously documented cases, the presence of this fibrous pseudotumor could have predisposed this patient to sustaining a penile fracture. In 50% of patients, an associated hydrocele occurs, with moderate vascularity existing within these plaque-like lesions.

Ultrasound appearances of these lesions are highly variable, presenting as solid masses with variable echotexture depending on the amount of fibrous and cellular tissue and calcifications. In the absence of calcification, most shadowing is because of dense fibrous stroma. Magnetic resonance imaging has been reported to be helpful in further characterization of these lesions preoperatively and in follow-up of these patients.[5] On T1-weighted scans, these lesions demonstrate intermediate signal intensity, whereas on T2-weighted imaging, low signal intensity is secondary to the fibrous nature of these lesions. Typically, they are nonenhancing with gadolinium.[4]

Grossly, these tumors are multinodular mobile lesions that vary from discrete pedunculated lesions to small confluent masses. Seventy-five percent of these lesions arise in the tunica vaginalis, with the remainder occurring in the spermatic cord, tunica albuginea, and epididymis.[3] The cut surfaces of fibrous pseudotumors illustrate a gray-white appearance, with a tightly whorled pattern and can be fixed or free within the tunica.

Microscopically, these nodules are composed of dense acellular collagenous bands and hyalinized tissues with proliferative fibroblasts.[3] Large numbers of mature plasma cells are scattered diffusely in a rich collagenous stroma in the inflammatory phase. A mixed inflammatory cell infiltrate, granulation-like tissue, focal calcification, ossification, and myxoid change might be present. Electron microscopy shows a mixture of cell types in a dense collagenous matrix, with no glandular or mesothelial differentiation.[1] Morphology, histology, and immunohistochemical analyses are necessary for equivocal cases.

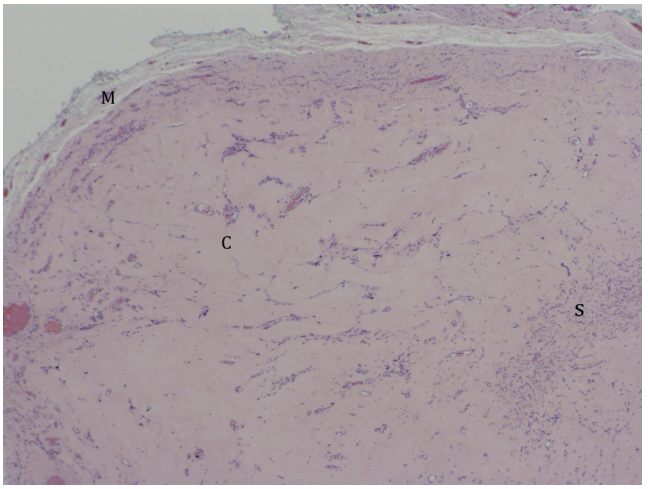

Figure 3. Hematoxylin and eosin staining. Well-circumscribed margin around a hypocellular mass within a dense collagenous stroma. C, collagen; M, margin; S, stromal cells.

In this reported case, the fibrous pseudotumor was located on the penile shaft, and complete excision is curative, as these lesions behave in a benign fashion once excised.[1] When testicles are involved, local excision of these lesions with sparing of testicles is standard. In equivocal cases, frozen section biopsy has been reported in aiding management and avoiding radical surgery. However, radical orchiectomy is often necessary for fibromatous periorchitis, when tunics are too diffusely involved for preservation of testicular tissues.[3] Clinical recurrence has been hypothesized in incomplete excisions of these lesions; however, there have been no reports of recurrence, and certainly there have been no cases demonstrating metastatic potential.

Conclusion

A penile lump with a history of previous trauma should prompt the physician to consider the differential of fibrous pseudotumor. In the setting of operative repair of penile fracture, if dissection is difficult and a fibrous mass is identified, one should consider the diagnosis of fibrous pseudotumor. Excision of the lesion and repair of fracture should provide definitive treatment.

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