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Bilateral corpus cavernosum abscess: a case report and a review of the literature

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Abstract

Background Corpus cavernosum abscess is an uncommonly described urological condition. We report a case of bilateral corpus cavernosum abscess in a 49-year-old man with a history of the left scrotal abscess.

Case presentation A 49-year-old man was present with 10 days history of painful and swollen penis. He had a history of an abscess in the left scrotum. The examination revealed non-erythematous palpable edema and tenderness on the shaft of the penis. Laboratory results showed leukocytosis. He was diagnosed with bilateral corpus cavernosum abscess and right testicular hypotrophy after an MRI examination. He underwent a bilateral corporotomy, debridement with Mulcahy salvage solution, and placement of a Penrose drain.

Discussion A penile abscess can be caused by a variety of factors. Treatment includes intravenous antibiotics, radiologically guided needle aspiration, or open surgical drainage.

Conclusion In addition to antibiotic treatment, surgical debridement is required for the majority of penile abscess cases.

Keywords Penile abscess, Corporal abscess, Penile infection

1 Introduction

Penile abscess is an uncommonly described urological condition. It has been linked to erectile dysfunction injection therapy, penile instrumentation, trauma, and priapism. Among the identified risk factors are immunosuppression and local or distant infection [1, 2]. Microorganisms such as *Staphylococcus aureus*, Streptococci, and Bacteroides are common causative agents [3]. Because of its rare occurrence, there are no epidemiological reports of corpus cavernosum abscess. However, an integrative analysis of corpus cavernosum case reports found 42 cases of corpus cavernosum abscess [4]. We hereby present isolated corpus cavernosum abscess case with a history of scrotal abscess.

2 Case presentation

A 49-year-old man was referred to our center with 10 days history of painful and swollen penis associated with recurring dysuria. The patient denied having a history of substance injection into the penis, foreign object in the penis, infection or abscess in the teeth and gums, diabetes mellitus, asthma, allergies, or heart and lung disease. Since the pain onset, the patient has noticed that his erection is not as hard as before.

One month before admission, the patient had a history of fever that did not improve with antibiotics and pain in the left testicle. The patient then went to the hospital and underwent a testicular Doppler ultrasound with the findings of suggestive left epididymo-orchitis, with suspect gas forming abscess of left intratesticular and lower pole of left scrotal, mild left complex hydrocele, no sign

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of testicular torsion, suspect hypotrophy of the right testicular with mild microlithiasis (grade I), and mild grade of the left varicocele at supra-testicular (Fig. 1). Debridement and left orchidectomy were performed because of non-vital left testis.

The physical examination on penis revealed non-erythematous palpable edema and tenderness on the shaft of the penis. Surgical scars were identified in the left scrotal region, but no seepage or tenderness was found (Fig. 2). No scar, hematoma, or mass was found in the flank region. Laboratory results showed leukocytosis, and no bacteria were found in urinalysis.

The penile Doppler ultrasound result showed diffuse enlargement of bilateral corpora cavernosa, with suspect intra-corpora fluid collection and increasing of peripheral and capsular vascularization, suspect pocket abscess DD/necrotic tissue, and hematoma. There is positive blood flow in both cavernous arteries. Mild fluid collection is observed at the spermatic cord, which is likely a post-operative finding and shows peripheral calcification. Additionally, there are multiple enlarged lymph nodes in both the left and right inguinal (groin) regions. MRI result showed abscess formation including bilateral corpus cavernous, there were no abscess in intra-cavum pelvic, and inflammation seen on the left testicular bed and left funiculus spermaticus (Fig. 3). The patient was diagnosed with bilateral corpus cavernosum abscess and right testicular hypotrophy.

The patient managed with bilateral corporotomy, abscess drainage, and debridement of corpus cavernosum. Lateral incision was made, and 50 ml of pus was drained from the right corpus cavernosum. Debridement of necrotic tissues was conducted. Corpus cavernosum was irrigated using Mulcahy salvage solution (all wound spaces were washed with alternating between 0.9 percent sodium chloride, vancomycin–gentamicin, povidone-iodine, and hydrogen peroxide). Penrose drain was inserted, and the corpus cavernosum was closed with absorbable sutures. The pus was sent for culture and sensitivity, which revealed *Klebsiella oxytoca,* and the patient was treated by 2 weeks of antibiotic

Fig. 2 Physical examination showing swollen penis with scars in the left scrotal region

(ampicillin–sulbactam and metronidazole). Several days after Penrose drain, the surgical wound was infected and not healing well, therefore consulted to reconstructive plastic surgeon, and instructed to wound dress with Manuka honey and sodium carboxymethylcellulose and 1.2% ionic silver (Aquacell™) 2–3 times per week for 2 weeks, with good outcomes, which is seen by reduction of the exudate and slough in the wound. There was also marked growth of the granulation tissue (Fig. 4).

Re-debridement was performed three times within 1 month, followed by transpositional flap on the right side and advancement flap on the left side of the surgical wound by reconstructive plastic surgeon within 3 weeks after the first procedure.

Two weeks post-operative follow-up showed a good wound closure, intact, and no blood seepage at the edges of the tissue (Fig. 5). The patient's erectile ability was also felt good. A month after surgery, the wound was well controlled with minimal pain. Two months after surgery, the patient's sexual function was normal with EHS 4 and IIEF score of 22 controlled by 5-mg Tadalafil, the wound was well controlled, and there was no more pain.

Fig. 1 Testicular Doppler ultrasound

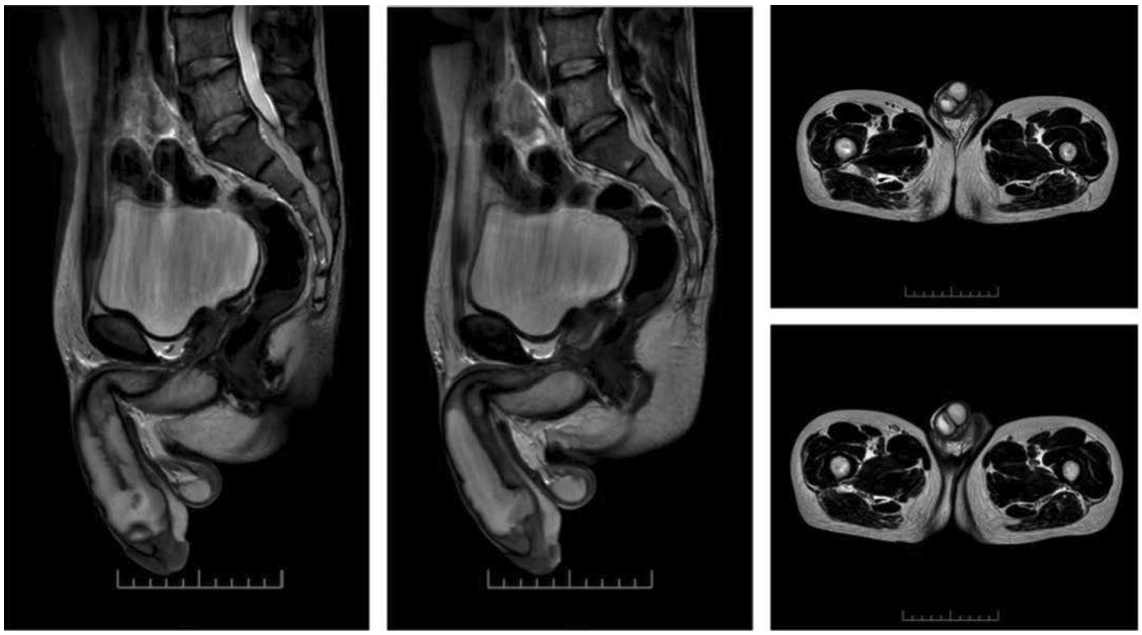

Fig. 3 MRI examination result shows bilateral corpus cavernosum abscess, without corpus spongiosum, and intra-cavum involvement

Fig. 4 Intraoperative view

3 Discussion

Penile abscess is an uncommon urological condition that typically manifests as a localized penile swelling and pain. Penile abscess can be caused by a variety of factors, including penile trauma, substance injection into the penis, priapism, penile prosthesis, and disseminated infection [1, 5, 6]. Diabetes, dental caries, and sexually transmitted diseases are regarded as risk factors for penile abscess [5]. There are a significant number of cases of spontaneous penile abscess for which no causative factor has been identified [2, 7]. In our case, before the patient developed a penile abscess, the patient suffered from a left scrotal abscess and underwent debridement surgery and left orchidectomy. The penile abscess may be due to dissemination from the previous scrotal abscess,

Fig. 5 Two weeks post-operative follow-up

as there are no identified factors that could lead to this condition.

Ultrasonography, computed tomography [8], and magnetic resonance imaging (MRI) [9] scans of the penis are used for diagnosis. Ultrasonography is a readily accessible method for locating and guiding drainage [1, 10]. As there is no evidence of a modality's superiority over another, the choice of imaging modality should be individualized. In this case, we used ultrasonography to aid in the diagnosis of corpus cavernosum abscess.

Penile abscesses may be treated with intravenous antibiotics, radiologically guided needle aspiration, or open surgical drainage. Antibiotic treatment should be based on the microorganism isolated form culture and sensitivity, but it can be started empirically. Open surgical drainage permits complete drainage and rinsing of the abscess, as well as a more thorough examination of the surrounding concomitant pathology [1]. Furthermore, two-stage penile reconstruction using scrotal flap may be performed in some cases of penile abscess [5].

Yamagishi et al. reported a case of idiopathic penile abscess treated with drainage and incision and 40-mg prednisolone, resulting in a reduction of pus and eventual wound closure. The dosage of prednisolone was gradually reduced to 5 mg over the course of 15 months, and the abscess continued to shrink [11]. Another case of corpus cavernosum abscess reported by Tuzel occurred in a healthy man who had been using long-term androgenic anabolic steroids. Surgical drainage with a Penrose drain was performed, as well as the injection of a broad-spectrum antibiotics for a week. Three months after the surgery, the patient had no complaint except mild left-sided deviation on erection without any sexual dysfunction [12].

Surgical treatment of penile abscesses may result in a variety of complications. Penile curvature is the most common complication following penile abscess and its surgical treatment. The development of penile fibrosis and curvature after surgical drainage generally does not result in poor erectile function [2]. In contrast, the drainage procedure usually reversed the condition. Although rare, partial erectile dysfunction after abscess drainage after 6-month follow-up has been previously reported [13]. Complications that arise after surgical drainage may necessitate additional treatment with a penile prosthesis, extracavernous prostaglandin therapy, or surgical intervention [2]. In this case, bilateral corporotomy, irrigation using Mulcahy salvage solution, and installation of Penrose drain were performed. The Mulcahy procedure was conducted as it could give up to an 82% long-term infection-free rate [14]. There were no complications found in this case.

4 Conclusion

Penile abscesses are an uncommon condition. There are numerous causes of penile abscesses, such as penile injection, penile trauma, disseminated infection, and idiopathic. Treatment should be based on the severity of the infection and the underlying cause. In addition to antibiotic treatment, surgical debridement is required for the majority of penile abscess cases. Penile fibrosis and penile curvature are potential complications of surgery. These complications rarely necessitate treatment, but they should be addressed prior to and after surgery. Further research is needed to better understand how the corpora became infected, particularly considering the anatomical barrier of the tunica albuginea. It suggests that more investigation is required to determine whether the infection breached this barrier or if vascular factors were involved. Additionally, the observation that erectile function returned to normal after a few months post-corporotomy suggests that the source of the infection may have been external to the corpora. Thus, further studies are necessary to elucidate the exact mechanisms and origins of the infection.

Abbreviations

DD	Differential diagnosis
MRI	Magnetic resonance imaging
EHS	Erection hardness score
IIEF	International Index of Erectile Function

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Declarations

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Consent for publication
Written informed consent for publication of the patient clinical details and clinical images was obtained from the patient.

Competing interests
The authors declare that they have no conflict of interest.

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