

Case – Conservative management of deep penile skin infection post-three-piece penile prosthesis implantation

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Introduction

Erectile dysfunction (ED) is the consistent inability to obtain or maintain penile erection of sufficient rigidity to permit satisfactory sexual performance for at least three months.¹ It affects one in two males over the age of 40.¹ Once reversible causes of ED have been ruled out, the treatment steps involve oral medication followed by injection therapy, urethral therapy, and vacuum erection devices. Surgical penile prosthesis (PP) implantation is an excellent option and remains a very successful alternative for men with refractory ED. Every year, up to 25 000 PP implantations are performed in the U.S.²

Although penile prosthesis infection (PPI) rates are less than 3% in virgin cases involving otherwise healthy patients, the rates of infection are much higher in patients who are diabetic (8%), undergoing revision surgery (10%), or on oral prednisone (20%).³ It remains the most serious postoperative complication and requires prompt surgical consultation.

Historically, removal of the prosthesis followed by a long course of antibiotics and re-implantation after 3–6 months is recommended.² In the last 20 years, the Mulcahy salvage technique, a one-stage salvage operation involving prompt removal of all hardware and several steps of antibiotic irrigation with immediate implantation of a new device, has gained popularity in similar scenarios.^{2,4}

Recent studies have explored the role of conservative management (i.e., antibiotics) for localized/superficial infections following insertion of PP and have shown promising findings.^{5–8} In these circumstances, given the lack of systemic symptoms (temperature $\geq 38^{\circ}\text{C}$, leukocytosis, skin necrosis), the infection is localized in the skin and subcutaneous tissues. Therefore, rapid intervention with the appropriate antibiotics

may prevent prosthesis involvement, which would require surgical extraction of the device or a salvage procedure.

Case report

A 58-year-old male was referred to a urologist for a 22-year history of ED despite first- and second-line treatment. He failed phosphodiesterase-5 inhibitor and intracavernosal injections such as Triix and Supertrimix. Etiology of the ED was determined to be secondary to severe impairment of veno-occlusion, moderate arterial insufficiency, and a ventral Peyronie's plaque resulting in a 40-degree ventral deviation based on the penile doppler assessment. His Sexual Health Inventory for Men and Quality of Life score and were 2/25 and 1/6, respectively. The patient was an active smoker and was known for recurrent (x3) bladder transitional cell carcinomas (CIS), the latest recurrence being in 2016. He had a transurethral resection of bladder tumor in 2014 and bacillus Calmette-Guérin (BCG) treatment in 2017.

A Coloplast Titan[®] prosthesis (three-piece) was inserted using a longitudinal penoscrotal incision. The patient was given intravenous (IV) vancomycin and gentamycin before the implantation of the prosthesis. The implant was also dipped in Septra antibiotic (AB). The surgery and immediate postoperative course were uneventful.

At one-month followup (postoperative day 28), the patient was doing well, with no signs of infection of the prosthesis. The following day, the patient accidentally opened the incision with his nail. He had also initiated oral sexual intercourse around the same time against medical advice.

He presented to the emergency room (ER) on a Sunday night with penile swelling, erythema, nausea, and increased pain. His vital signs were normal. However, there was visible erythema, swelling, induration, and a 2 mm long and 10 mm depth wound dehiscence on the ventral aspect of the penis above the testicles with a purulent discharge from the site of incision (Fig. 1). The groin lymph nodes were enlarged. Abdominal and testicular exam were unremarkable for inflammation. PPI was suspected by the ER doctor.



Fig. 1. The patient presented with visible erythema, swelling, induration, and a 2 mm long and 10 mm depth wound dehiscence on the ventral aspect of the penis above the testicles with a purulent discharge from the site of incision.



Fig. 2. Patient was treated conservatively with antibiotics and after 24 days showed no signs of infection.

Management

Complete blood count (CBC), electrolytes, urinalysis, and urine microscopy were unremarkable. Wound site swabs were taken for culture and sensitivity. The opened wound got enlarged, yet the penile prosthesis was covered by a layer of tissue and was not visible, which was reassuring for sparing of the prosthesis. Local drainage of the abscess was performed at the bedside by the ER physician before the patient was admitted to the urology department. Treatment with 2 g of IV cefazolin three times daily (TID), in addition to analgesics and deep venous thrombosis (DVT) prophylaxis were initiated by the urologist on call. The urologist who had performed the surgery was consulted and requested to change the AB to tobramycin 260 mg IV daily and vancomycin 1 g IV TID. The surgeon planned to assess the case on the following day since the CBC was normal and the patient did not have fever or evidence of systemic infection.

The next morning, the treating urologist assessed the patient and saw a 3x1cm open wound that was still draining. The implant could not be seen through the wound and

the induration was limited. The pump in the scrotum was free and easily palpable in the posterior aspect of the scrotum. After a thorough discussion with the patient, the shared decision was made to continue conservative management with ABs and regular local cleaning with 0.9% saline.

On day 4, the wound culture results demonstrated the presence of *Corynebacterium*, *Peptostreptococcus asaccharolyticus* and *anaerobius*, *Bacteroides asaccharolytica* and *Staphylococcus epidermidis*. The infectious disease specialist was consulted and recommended removal of the PP and switching the AB to piperacillin-tazobactam TID. However, the wound was progressively healing, with no sign of involvement of the implant, and the surgeon decided against removal of the implant at this stage. The symptoms had greatly improved by day 6 and the patient was discharged home with 500 mg of clavulanate TID and 500 mg of metronidazole TID for four weeks. An antifungal was added to his outpatient regimen due to the presence of oral microbes in the wound. The patient was seen in clinic 24 days later with no signs of infection (Fig. 2).

Discussion

Penile prosthesis implantation is an excellent treatment option for men with refractory ED. Over the years, despite many advancements to minimize the risk of prosthesis infection, PPI remains a non-negligible and serious complication, with rates of infection ranging from 1–20% depending on a patient's comorbidities.^{2,3,5} When an infection occurs, complete and timely prosthesis removal, systemic ABs, and local irrigation/drainage of the surgical site are the mainstay of treatment in many patients. The decision to insert a new PP would only be discussed with the patient once the infection had cleared a few months later, unless a Mulcahy salvage technique is performed.⁴

There is scarce evidence to support the sole use of ABs to treat such infections. Derouet et al published a case series on three patients with PPI presenting with minimal systemic symptoms or laboratory abnormalities that were successfully managed with local and systemic clindamycin.⁶ In these cases, the prosthetic parts were not visible after opening the abscess, but connection with the prosthesis was confirmed with radiographs or magnetic resonance imaging. The patients reported complete resolution of symptoms and were satisfied with their PP in subsequent followups.⁶ More recently, Henry et al presented an abstract where 13 of their included 15 PPI cases had complete resolution with conservative therapy. In that study, conservative therapy was only considered if the patients did not have systemic or septic symptoms.⁷ Finally, Habous et al performed the largest retrospective study on 37 patients who underwent conservative therapy for a PPI and reported an 84% success rate, with a mean complete resolution at 49 days (range 29–97, standard deviation 15.8 days).⁵ Patients were excluded if they presented with signs, symptoms, or laboratory findings suggestive of sepsis. They concluded that conservative therapy is a safe, patient-friendly, and cost-effective option for those with no signs of systemic illness.⁵

This was the first case of a significant, localized infection associated with recent implantation of a PP treated with conservative management in our center. The patient experienced complete resolution of symptoms within 24 days and was

able to return to normal sexual activity shortly after. Such a result is not possible with surgical management. Despite the heterogeneity in the AB regimens across the cited studies, the success of conservative therapy remains important. However, given that this was the first case of conservative management in our center, we are unable to derive specific management recommendations from our experience. Instead, we would highly suggest that the management of such presentations be approached on a strict case-by-case basis until further evidence is published on the matter. We believe this report may contribute to further studies on the role of conservative management in patients with superficial PPI.

Competing interests: Dr. Carrier has been an advisory board member for Acerus and Paladin/Endo; a speakers bureau member for Acerus, Coloplast, and Paladin/Endo; received a fellowship grant from Boston Scientific; received a proctorship from RedLeaf; and participated in clinical trials supported by Urotronic. The remaining authors do not report any competing personal or financial interests related to this work.

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