An Unusual Management of Scrotal Erosion of Pump Tube as a Unique Complication of Artificial Urinary Sphincter: Case Report

Artifisyel Üriner Sfinkter İmplantasyonlu Hastada Nadir Bir Komplikasyon Olan Pompa Borusu Skrotal Erozyonunun Farklı Bir Tedavi Şekli

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ABSTRACT Artificial urinary sphincter (AUS) implantation is the most effective treatment for male stress urinary incontinence after radical prostatectomy. However, it is highly associated with several complications. AUS erosion mostly involves the urethral cuff and its management requires removal of all the components. However, erosion through scrotal skin of pump tubing of an AUS has not been previously and the management for isolated scrotal pump erosion is a unique problem. Herein is discussed a case of a pump tube erosion treated surgically preservation of the implant with satisfactory results.

Key Words: Urinary sphincter, artificial; urinary incontinence, stress

ÖZET Artifisyel üriner sfinkter (AUS) implantasyonu radikal prostatektomi sonrası gelişen stres üriner inkontinansın en etkili tedavi şeklidir. Ancak, bu cerrahi sonrasında birçok komplikasyon gelişme riski vardır. AUS erozyonu genellikle üretral kaf erozyonuna bağlı gelişir ve bunun tedavisi bütün parçaların çıkarılması ile olur. Ancak, AUS pompa borusunun skrotal deride erozyon oluşturması ve izole pompa erozyonu çok nadir görülen komplikasyonlardır. Bu olgu raporunda pompa borusu erozyonu olan hastanın cerrahisiz tedavisi ve bunun sonuçları tartışılmıştır.

Anahtar Kelimeler: Üriner sfinkter, yapay; üriner inkontinans, stres

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The artificial urinary sphincter (AUS) has long been considered the gold standard treatment for post-radical prostatectomy incontinence. Although efficacy and satisfaction rates are high as long as patients have a working implant in place, AUS, as a mechanical device with several components, can frequently lead to various complications requiring revision surgery and/or replacement of implanted device.[1] These complications can be divided into the categories of incontinence, urinary retention, mechanical failure, cuff erosion and/or infection, and unusual complications.[2] AUS erosion mostly involves the urethral cuff and its management requires removal of all the components.[3] However, erosion through scrotal skin of pump tubing of an AUS has not been previously reported. Treatment of isolated scrotal pump erosion is a unique management problem. Herein is discussed a case of a pump tube erosion treated surgically preservation of the implant with satisfactory results.

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CASE REPORT

A 71-year-old male patient with AUS for post-prostatectomy incontinence (PPI) presented with scrotal skin erosion of pump tube at the scar site of previous scrotal incision with no sign of infection for 2 weeks.

Further history noted no fevers, chills or radiotherapy. He had a male sling and transurethral bulking agent injection for PPI, yet he failed both and finally was implanted an artificial urinary sphincter (AMS 800™, American Medical Systems, Minnetonka, MN, USA) in 2008, using bulbar approach. Five years later, he underwent an AUS revision surgery requiring just pump replacement via scrotal midline raphe incision due to pump malfunction in June 2013. The patient used well the device for 3 months. However, he experienced pain and discomfort with the use of the device and erosion of the pump tubing occurred at the previous scrotal raphe incision 5 months after the revision (Figure 1). On painful examination, extrusion of the connecting tube of the pump was noted at the eroded scar site of midline scrotal incision, the pump was migrated medially to the previous midline incision and the appropriate functioning of the implant was confirmed as well as the absence of discharge or inflammation at the site of the erosion.

FIGURE 1: Preoperative image of tubing erosion.

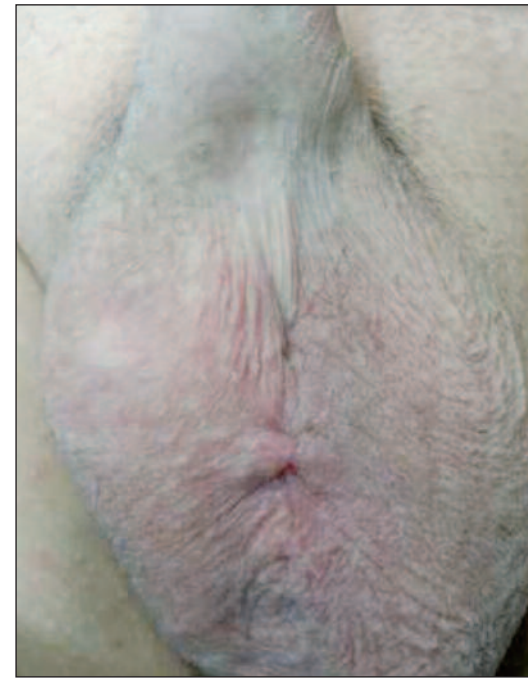

FIGURE 2: Final appearance of scrotum after hyperbaric oxygen therapy and intensive therapy.

The patient was immediately started on broad-spectrum parenteral antibiotics (tazocillin plus amikacin). At exploration, a new deeper subdartos pocket was created via a new ipsilateral inguinal incision for the pump and the extruded tubing, which were copiously irrigated with an antibiotic solution (gentamicin and rifampicin) and the pump was relocated into the new pocket, but not replaced. The scrotal skin around the area of erosion was excised and the defect was closed in formal manner using 3-0 coated polyglactin 910 suture. A 14 F urethral catheter was inserted after AUS deactivation. Postoperatively, parenteral antibiotics were administered for a total of 5 days.

On postoperative visits, wound healing at the site of the scrotal incision seemed to be inadequate, while inguinal healing was complete. To improve the healing process, hyperbaric oxygen therapy (HBOT) was initially applied for 14 sessions and additional 10 sessions with a restarted parenteral antibiotherapy for incomplete scrotal wound healing with hyperemia at the postoperative visit of 3 weeks. Finally, the patient had no complaints and abnormal signs of wound healing and infection at 2 month follow up after the intensive therapy (Fig-

ure 2). The implant was tested and functioned well after 8 weeks of deactivation period and at 4 month follow up.

The authors declare that they have no conflict of interest.

DISCUSSION

The AUS remains the established device for treatment of severe PPI, with excellent long-term outcomes and patient satisfaction. However, AUS, as a mechanical and artificial device, can lead to various complications that require revision surgery at a rate of 16% and 28% at 2 and 5 years, respectively.[4] Erosion, as one of the most frequent complication of the device, mostly involves urethral wall under occlusive cuff.[3] Although erosion of other AUS components is also possible, isolated erosion through skin of connecting tubing of an AUS pump has not been previously reported.[3] To the best of knowledge, we hereby report a first case of erosion through skin of pump tubing of an AUS. Furthermore, the same absence of tubal erosion is noted in the extensive reviews of complications of inflatable penile prostheses functioning with the same mechanical principles.[5]

Several risk factors have been determined for development of urethral cuff erosion, including hypertension, coronary artery disease, prior radiation therapy, and prior AUS revisions.[6] We also think that the case of scrotal erosion resulted from prior pump replacement via scrotal midline raphe incision due to pump malfunction 5 months ago, by leading to that the pump and tube were not buried deep enough, as in reports by Boateng et al. and Morales, and subsequent malposition of these components toward the prior incision site.[3,5] Moreover, the development of erosion of implant components at the prior incision site has been emphasized as a risk factor in some reports of AUS, and inflatable penile prosthesis (IPP).[3,7] Finally, the erosion was easily occurred in the compromised scrotal incision site with chronic irritation from daily frequent activation of the device.

Cuff erosion mandates early removal of whole AUS because erosion is usually accompanied by infection.[3,8] However, treatment of isolated scrotal pump erosion is a unique management problem. Unfortunately, such cases reported in the literature to date remains scant.[3] Theoretically, there are several management options for sterile tube erosion of AUS pump, which include isolated removal of eroded pump and reimplantation of a new one in a same session, transferring eroded pump to contralateral side, removal of the entire device with immediate or delayed reimplantation. Undoubtedly, the safest approach is the traditionally removal of the device as in cuff erosion.[8] However, the approach consisting of limited explantation of the involved eroded pump followed by subsequent replacement, as in the first revision surgery of the case, has a definite financial advantage with or without device warranty, even though that option has not been previously described for AUS. However, there are some published reports of pump erosion of IPP which was treated by this approach with conflicting results, demonstrating that this approach is feasible, even though the results are conflicting.[5,7] Another unique option is the transferring eroded pump to contralateral side. Imamoglu et al. have mentioned on this approach for a scrotal erosion of pump in a patient of 22 AUS patients in their comparative study of Macroplastique injection with AUS implantation for treatment of PPI.[9] Although this management strategy seems surgically and financially reasonable for sterile erosion of pump and/or tubing, it often requires left manual dexterity. Furthermore, connecting tube of the pump should have intentionally been left in longer by predicting such a complication at initial surgery. If not predicted, connecting tube would be too short to transfer a pump from eroded side to contralateral side. We opted, a fourth option, simply for relocation of the exposed tube with the pump into a new and deeper pocket after salvage washout. Some recent anecdotal reports have stated that salvage procedure without replacement could be possible in cases with a sterile erosion of an AUS component.[3,8] Boateng and colleagues, have reported sterile tube erosion of an AUS device at the site of inguinal incision, successfully managed by antiseptic irrigation of the wound and involved

tube, followed by immediate repositioning.[3] They have suggested that their management option may be considered for patients with low risk of infection and high morbidity risk of complete device removal. Singla and Singla, have reported their unique experience in 2 patients who have been successfully managed conservatively for a prolonged duration after sterile cuff erosion suggesting that immediate removal of AUS after sterile cuff erosion may occasionally be instituted only in difficult cases where repeat AUS implantation is not possible.[8]

This single case illustrates a unique misadventure of the device and emphasizes that sterile extrusion of a tubing component may be successfully managed by reinsertion without removing some or all the components of the functional implant even when the extrusion has been prolonged for 2 weeks, even though our approach cannot be generalizable to all patients with eroded component of functional AUS. Another practical lesson to be learned from this unique case is that, scrotal wound healing could be compromised by eroded part of artificial urinary sphincter, as a foreign body. However, there are more likely other causative local and systemic factors implicated healing process in the case, such as older age and tissue hypoxia that can be effectively overcome by hyperbaric oxygen therapy as an adjunctive treatment. Animal studies and clinical trials have demonstrated the benefits of HBOT on the hypovascular-hypocellular- hypoxic environment of a chronic wound when the wound has not responded to other treatments.[10]

Almost all surgeons consider erosion of any component of an AUS as an indication for total device removal. However, our case with the growing body of the related AUS and IPP literature revealed that isolated scrotal pump erosion is a unique complication of artificial urinary sphincter implantation and the selected cases can be salvaged surgically without device replacement.

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