CASE REPORT

Tubing Erosion of an Inflatable Penile Prosthesis Long after Implantation

Alvaro Morales, MD
Department of Urology, Queen's University, Kingston, ON, Canada
DOI: 10.1002/sm2.30

ABSTRACT

Introduction. Erosion through skin of connecting tubing of an inflatable penile prosthesis (IPP) has not been previously reported.

Aim. The aim of this study was to present a case of tubing erosion, review the pertinent literature, and discuss the possible causes and management options, including preservation of the device and its components.

Methods. A 42-year-old male failing to respond to medical treatment for erectile dysfunction underwent insertion of an AMS 700 IPP in 1986. Six years later, a revision was necessary because of a leak in the right cylinder and 4 years after, the pump was replaced. Fourteen years after the original implant, he presented with a portion of the tube connecting the pump to the right cylinder eroding through the skin. There was no infection. The skin area involved was resected and the original pump and tubing were buried in a new scrotal pocket after thorough irrigation.

Results. The IPP remained in place, allowing vaginal penetration and without infection for another 11 years. Three years later, it was de-functionalized, converted into a fixed volume device. It eventually was replaced 25 years after originally implanted with a semirigid prosthesis because it did not provide sufficient rigidity and because of concerns about the presence of “screws” detected during pelvic imaging.

Conclusions. Mechanical failures in the early IPP models, as illustrated in this case, were expected. However, the long survival of the device is remarkable. Erosion of the connecting tubing through the skin is unique and, under exceptional circumstances, may be managed conservatively without replacing components of the IPP. Clinicians unfamiliar with procedures involving inflatable devices need to be aware of “foreign bodies” visible in radiological examinations in men who have had revisions of an IPP. Morales A. Tubing erosion of an inflatable penile prosthesis long after implantation. Sex Med 2014;2:103–106.

Key Words. Inflatable Penile Prosthesis; Complications; Erosion; Tubal Erosion

Introduction

The launch of the inflatable penile prosthesis (IPP) 40 years [1] ago represented a significant improvement in the management of erectile dysfunction. As a mechanical device with several components, it was anticipated that failures would be common. In fact, long-term, revision-free survival of penile implants is one of the highest among medical devices used in humans [2]. The IPPs, however, are not free of complications that can be mechanical (cylinder or reservoir tear, pump failure, tube kinking) or nonmechanical (infection, erosion). Infection is a catastrophic complication almost universally leading to device removal. Erosions of a cylinder [3], the reservoir, or the pump are also recognized complications requiring its prompt removal to prevent bacterial
spread to the other components of the device. Erosions of the tubing many years after the implant is exceedingly rare and results in removal of the prosthesis [4]. Herein is discussed a case of a connecting tube erosion treated conservatively with satisfactory results.

The Story

A 42-year-old divorced man was seen in 1985 with a 10-year history of progressive decline in erectile function. He had a 20-year history of two-pack cigarette smoking. He underwent a thorough evaluation and was given a diagnosis of sexual dysfunction of mixed etiology for which he received counseling and initial treatment with yohimbine. He failed both. Intracavernosal injections with papaverine (the standard at the time) allowed him to resume intercourse but the erections remain of insufficient quality and he found the procedure cumbersome and painful. He opted for a penile prosthesis; an AMS Inflatable 700 device was inserted through an infra-pubic approach without complications in April 1986.

He was seen almost six years later because poor inflation of the right cylinder. At exploration, a tear near the entry of the tubing from the pump was noted. The right cylinder, tubing, and connectors were replaced. The device continued to perform well for another 4 years when the patient complained of inability to inflate it. On this occasion, the pump was found to malfunction and was replaced. In July 2000, 14 years after the insertion of the original device and 8 years after the revision/replacement of the right cylinder, the patient presented with the unusual complaint of noticing the progressive appearance of plastic material at the base of the penis. He experienced no pain or discomfort and maintained frequent use of the prosthetic device. On examination, the appropriate functioning of the device was confirmed as well as the absence of discharge or inflammation at the site of the extrusion (Figure 1). Cultures from the eroded area, including the tubing, were reported as follows: normal flora with predominance of beta hemolytic Strep-tococcus Group B (S. agalactiae). No anaerobics were isolated. At exploration, the skin around the area of erosion was excised and a new deeper pocket was created for the pump and the tubing, which were irrigated with a modified multiple antibiotic solution (bacitracin and gentamicin, providone-iodine, hydrogen peroxide) [5] but not replaced. He had no complications but 3 years later, complained that the quality of the erections was not as good and he was using PGE-1 urethral pellets to augment the degree of penile rigidity. He wanted either a revision or the insertion of a semirigid device. In view of the fact that he was still able to achieve penetration, the option was given to replace the inflatable prosthesis with a semirigid one or to simply top up the cavernosal cylinders, de-functionalize the IPP, and convert it into a “malleable” or fixed volume device by capping the cylinders, removing the pump and tubing, and leaving the empty reservoir in situ. This was accomplished and the patient was satisfied. After another 8 years—the patient was now 62 years old—he was seen by another practitioner because of mild voiding difficulties and complaints of incomplete penile rigidity. Upon urological investigation, he was informed that he should have the prosthesis replaced with semirigid rods and at the same time have the “screws” left behind at the last procedure removed because they could impact on his health. This was carried out but the “screws” reported by the radiologist could not be found. They represented the metal plugs used to obliterate the tubes connecting the cylinders, the pump, and the reservoir.

Discussion

There are several practical lessons to be learned from the long survival of this device. The first relates to the initial mechanical breakdowns. Although the AMS 700 used in this man was an early model, the number of revisions over the long time span was acceptable: a 5-year malfunction rate as high as 62% was the norm; our patient was
free of problems for 6 years. A number of modifications of the AMS IPP introduced over the years significantly diminished the frequency of mechanical failures. Milbank et al. [6] reported a 5-year significant difference in mechanical failure-free rate of 64.7% and 77.7% between the early Ultrex and the post-1993 modified models, respectively. With a mean follow-up of 6 years, in a multicenter study, Montorsi et al. [7] reported mechanical failure in only 4%, with the majority occurring with the early Ultrex as compared with the improved devices. Wilson et al. [2] reviewed their large experience with a variety of IPPs. For the AMS 700 in 596 recipients, the 10- and 15-year revision-free survival was 58.9% and 48.2%, respectively. In an analysis of 200 cases of surgical revisions of inflatable devices by Henry et al. [8], the majority (65%) were due to mechanical failure. As in the present case, cylinder leakage was the most common cause of device failure with the early AMS 700 IPP. Mechanical failures require surgical exploration and repair.

Although the eventual replacement of the de-functionalized prosthesis was a valid reason for the final procedure in this case, the presence of an empty reservoir in the pelvis or the “screws” (in fact metal caps to seal the de-functionalized tubing) was not. Removal of all components in an infected device is standard of practice [9]. In the absence of infection and after previous surgeries, the tissue dissection required for the removal of those components is not justified.

Device explantation is not a common occurrence. The most frequent sites are at the scrotal pump or the distal cylinder followed by erosion of the reservoir in less than 0.4% of IPP procedures [10,11]. Erosion of the tubal components of IPP is extremely rare. No other case of late (years) erosion through skin of a connecting tube could be found in a PubMed search. In an early group of 145 AMS 700, erosion was found in two (1.4%) but none involved the connecting tubes [12]. The same absence of tubal erosion is noted in the extensive review of penile implant complications by Sadeghi-Nejad [13]. Brown et al. [4] reported the incidental discovery of an asymptomatic erosion of a connecting tube into the urethra 19 months after implantation of an Alpha-1 Mentor device. Their case and ours share the remarkable absence of obvious inflammation or infection. Their patient had the device removed while we opted simply for relocalization with satisfactory results.

A ready account for the tubal erosion long after implantation is not apparent. Although the patient admitted to frequent (twice/week) use of the device, an early disruption would have been expected. Whether the tube was not buried deep enough initially is certainly a possibility but, again, an early erosion would have been more likely. The long wait by the patient in seeking medical advice is surprising but not more than the lack of infection at the site of the erosion or dissemination into other components of the device.

Conclusions

This single case illustrates many (and a unique) of the potential misadventures with these devices. It emphasizes that extrusion of a tubing component may be successfully managed by reinsertion without the need to remove some or all the components of the implant even when the extrusion has been prolonged. Undoubtedly, the safest approach is the removal of the prosthesis. In a multicomponent IPP, it is a very significant undertaking that under special circumstances (absence of obvious infection, presence of nonpathogenic or low pathogenicity bacteria) may be circumvented as done successfully herein. It also illustrates the need for familiarity by the radiologist and, more importantly, the urologist, in interpreting images of the various components of an IPP, particularly when it has been previously revised. Furthermore, in case of revisions, surgeons should be thoroughly familiar not only with the devices but also with previous operative reports. If these cannot be met, competent referral is always a preferable course of action.

Corresponding Author: Alvaro Morales, MD, Department of Urology, Queens University, 59 Lakeshore Blvd. Kingston, ON, Canada K7M 6R4. Tel: 613 389-9275; Fax: 613 389-9275; E-mail: moralesa@queensu.ca

Conflict of Interest: The author reports no conflicts of interest.

References

1 Scott FB, Bradley WE, Timm GW. Management of erectile impotence: Use of implantable inflatable prosthesis. Urology 1971;2:80–2.
2 Wilson SK, Delk JR, Salem EA, Cleves MA. Long-term survival of penile prostheses: Single surgical group experience with 2,384 first-time implants spanning two decades. J Sex Med 2007;4:1074–9.
3 Choi YD, Choi YJ, Kim JH, Choi HK. Mechanical reliability of the AMS 700CXM inflatable penile prosthesis for the treatment of male erectile dysfunction. J Urol 2001;165:822–4.
4 Brown ET, Saunders SE, Zaslau S. Penile prosthesis pump tubing erosion into the urethra appearing as inabiity to catheterize: A case report. J Sex Med 2008;5:2690–2.

© 2014 The Author. Sexual Medicine published by Wiley Periodicals, Inc. on behalf of International Society for Sexual Medicine.
5 Mulcahy JJ. Long-term experience with salvage of infected penile implants. J Urol 2000;163:481–3.
6 Milbank AJ, Montague DK, Angermeier KW, Lakin MM, Worley SE. Mechanical failure of the American Medical Systems Ultrex inflatable penile prosthesis: Before and after 1993 structural modifications. J Urol 2002;167:2502–6.
7 Montorsi F, Rigatti P, Carmignani G, Corbu C, Campo B, Ordesi G, Breda G, Silvestre BG, Morgia G, Graziotin A. AMS three-piece inflatable implants for erectile dysfunction: A long-term multi-institutional study in 200 consecutive patients. Eur Urol 2000;37:50–5.
8 Henry GD, Donatucci CF, Conners W, Greenfield JM, Carson CC, Wilson SK, Delk J, Lentz A, Cleves MA, Jennerman C, Kramer AC. An outcomes analysis of over 200 revision surgeries for penile prosthesis implantation: A multi-center study. J Sex Med 2012;9:309–3015.
9 Kava BR, Burdick-Will J. Complications associated with retained foreign bodies from infected penile implants: Proposal for the use of an implant-specific check list at the time of device removal. J Sex Med 2013;10:1659–66.
10 Levine LA, Hoe MP. Review of penile prosthetic reservoir: Complications and presentation of a modified reservoir placement technique. J Sex Med 2012;2:2759–69.
11 Tran CN, Boncher N, Montague DK, Angermeier KW. Erosion of penile prosthesis reservoir into neobladder. J Sex Med 2013;10:2343–6.
12 Holloway FB, Farah RN. Intermediate term assessment of reliability, function and patients satisfaction with the AMS700 Ultx penile prosthesis. J Urol 1997;157:1687–91.
13 Sadeghi-Nejad H. Penile prosthesis surgery: A review of prosthetic devices and associated complications. J Sex Med 2007;4:296–309.