

When Titans become weak: penile prosthesis cylinder aneurysm, a case report

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Citation: Tavares C, Djinovic R, Spiridonescu B, Guerra C, Calleja Hermosa P, Sekulovic S. When Titans become weak: penile prosthesis cylinder aneurysm, a case report. Cent European J Urol. 2021; 74: 255-258.

Article history

Submitted: Apr. 4, 2021

Accepted: Apr. 8, 2021

Published online: May 10, 2021

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During the first 5 years after penile prosthesis implantation, complications such as malfunction requiring revision or replacement occur in only 7% of cases. We present a case of a 62-year-old patient who had a Coloplast Titan® prosthesis implanted while also undergoing girth enhancement corporoplasty. Shortly after, the patient noticed an increasing bulge on the side of his penis, which prevented total deflation. An aneurysm of the right cylinder was identified during reoperation; cylinders were replaced and the redundant tunica albuginea and septal defect were corrected by plication from inside the corpora cavernosa.

Key Words: penile prosthesis ↔ erectile dysfunction ↔ aneurysm ↔ tunica albuginea ↔ case report

CASE PRESENTATION

A 62-year-old male with a previous medical history of erectile dysfunction and Peyronie's disease had a Coloplast Titan® prosthesis of 20+3 cm implanted in 2016 in Brazil, while also undergoing a corporoplasty for girth enhancement. During this procedure, a corporoplasty was performed through two long longitudinal latero-dorsal incisions and apparently no graft was placed.

Shortly after the initial surgery, the patient noticed a bulge on the right side of his penis when inflating the prosthesis, causing pain and deformity during erection. The bulge increased progressively, to

the point of preventing total deflation of the prosthesis, rendering it inoperable. The patient also complained of a very superficial scrotal pump position that was uncomfortable. In October 2019, 4 years after the initial surgery, the patient presented to the Sava Perovic Foundation seeking a solution. On physical examination, a ventral curvature induced by the semi-inflated prosthesis was evident, with a clear bulge on the right side of the penis (Figure 1A). The high-riding pump was visible and substantially elevated the penoscrotal angle, giving an appearance of a shorter penis (Figure 1B). During the prosthesis revision surgery, a longitudinal ventral penile incision was made and dissection was

continued until the corpora cavernosa were reached; then, a ventral incision in the corpora was made to remove the cylinders. A 6 cm aneurysm of the right cylinder was evident upon removal (Figure 2A). A longitudinal ventral corporotomy exposed the thinned and redundant tunica albuginea of the right corpora, revealing extensive septal rupture with communication between the right and left capsules created by the cylinders (Figure 2B). Further exploration revealed erosion of the distal corporal tissue on the right side by the prosthesis, however with no urethral injury. Correction was ensued, first by removing part of the redundant tunica albuginea from inside the capsule (marked with a pen, as seen in Figure 2C) and closing this defect (Figure 2D) with a running suture using 6-0 polydioxanone sutures (PDS), cautiously as not to injure the overlying neurovascular bundle. The defect in the distal right corpora was also sutured. The next step was to correct the septal defect using the same suture material. A metal dilator was inserted in the corpora and the albuginea was sutured internally (Figures 3A and 3B). The reservoir was functioning well and remained untouched. The new prosthesis (Coloplast Titan® of 20 cm with a 2 cm rear tip extender) was inserted using the standard technique with a mesh 'sock' covering the distal tip of the right cylinder to prevent further erosion of the glans, as seen in Figure 3C. After prosthesis placement, a suprapubic 'Y' incision was made to correct the previous scar and to reconstruct the penile suspensory ligaments (Figure 3D). A suction drain was left in place and removed 3 days later. Post-oper-

ative recovery was uneventful. The patient was able to start inflating the prosthesis two weeks later, with no complications to date.

DISCUSSION

In the field of reconstructive surgery, the implantation of a penile prosthesis is a rewarding surgery with a satisfaction rate of over 90% [1]. Complications are rare: during the first 5 years after implantation, non-infectious complications such as malfunction of the prosthesis that require revision or replacement occur in only 7% of cases [2]. Not much can be done by the surgeon to reduce mechanical defects of the prosthesis, and predictors of mechanical failure remain unclear [3]. The Coloplast Titan® prosthesis has two cylinders and a reservoir made of 'Bioflex' polyurethane which is reported to have a higher tensile strength than silicone, allowing more efficient girth expansion while preventing aneurysms of the cylinders. This is why most surgeons undergoing penile straightening or girth enhancement procedures choose this prosthesis [4]. In the AMS 700™ prosthesis, a polypropylene layer was added between the two silicone layers of the prosthesis' cylinder to reduce leakage and aneurysms; in 2000 the AMS 700 CX™ was also reinforced with a parylene microcoat to reduce friction and thus avoid cylinder complications [5].

Chan et al. recently reviewed 99 cases of first-time reoperations in patients with an inflatable penile prosthesis: mechanical failure (such as tubing or

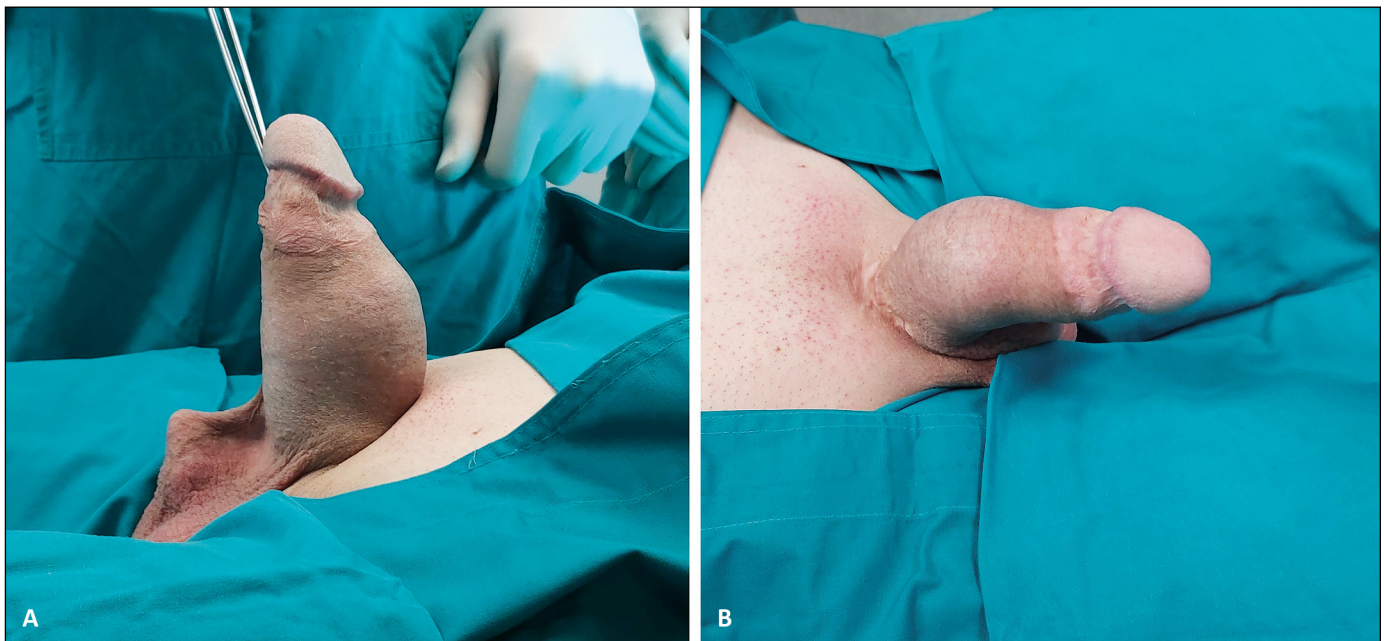


Figure 1. A and B. Pre-operative photos revealing ventral penile curvature, penile bulge and evident scrotal pump.

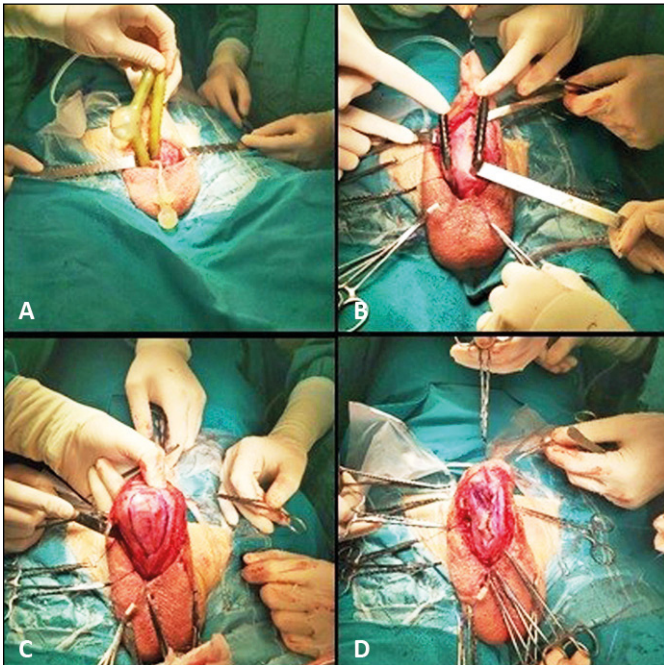


Figure 2. A. Right cylinder aneurysm; B. Septal defect showing communication between both right and left side; C. Redundant tunica marked with a pen for excision; D. Tunical closure with 6-0 polydioxanone sutures (PDS).

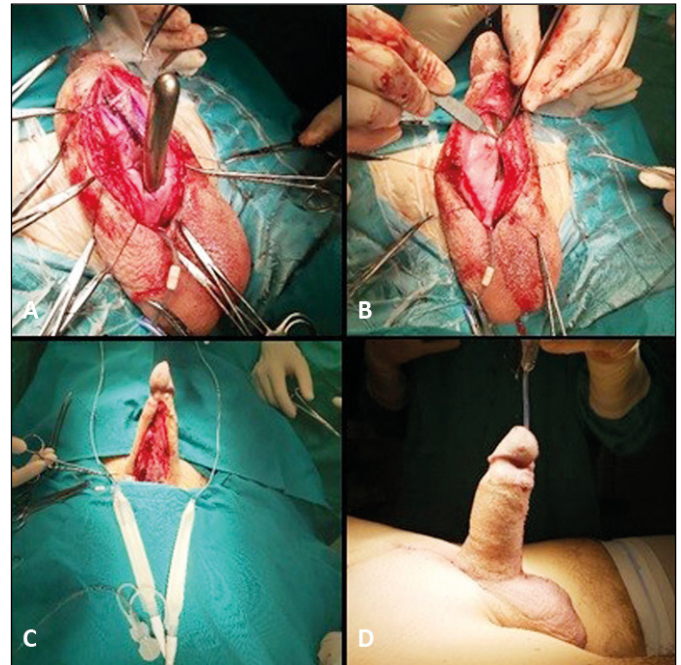


Figure 3. A and B. Right metal dilator inserted in tunical defect before closure; C. New Coloplast Titan® prosthesis before insertion; D. Final result.

cylinder failure) or technical complications (such as need for valve-pump repositioning or cylinder herniation) were responsible for 77.8% of reoperations [6]. In the study by Mirheydar et al. concerning all penile prostheses implanted from 1995 to 2010 in California, 11% of the 7666 patients receiving a penile prosthesis had revision surgery. Device malfunction was responsible for 57% of cases. Interestingly, 29.2% of reoperation surgeries were performed in a hospital different from that of the initial prosthesis surgery, which may explain different reoperation rates in case series [2].

Leaks and aneurysms, mainly attributed to an uneven inflation of the prosthesis' cylinder, have become very rare due to the improvements in materials used in the cylinder coating. In a study regarding long-term mechanical reliability of the AMS 700CX™/CXM, the rate of cylinder aneurysms or leaks was 4.7% with a median of 91 months of follow-up [7]. Similar data for the Coloplast Titan® prosthesis are not reported in the literature. We hypothesize the cylinder aneurysm in this patient may have been related to an extensive longitudinal corporotomy for girth enhancement during the initial surgery, with no grafting to ensure adequate support of the corporal tissue when the prosthesis was inflated. Oversizing of the prosthesis may have also contributed to the distal corporal erosion, and so a 2 cm rear ex-

tender of the prosthesis was used instead of the 3 cm previously implanted.

Different types of grafts have been used to replace or reinforce the tunica albuginea in penile reconstructive surgery. Autologous grafts from distant places such as tunica vaginalis, buccal mucosa or fascia lata may be harvested, increasing surgical time and risking morbidity due to donor site complications or tissue contracture and necrosis [8, 9]. Synthetic grafts have generally been abandoned due to risk of infection, inflammatory response, fibrosis, allergic reaction, and eventual contracture. Xenografts or tissue-engineered grafts are also available, such as bovine pericardium, porcine small intestinal mucosa, or equine collagen fleece, but may lead to an immunogenic response and penile deformity [8, 9].

This case represents a successful use of autologous tissue to reconstruct the tunica albuginea and allow for a new prosthesis to be inserted. Apoj et al. have reported a similar case in which they treated a patient with a cylinder aneurysm with distal corporoplasty using redundant tunica albuginea to reinforce the tunica, with satisfactory results 2 years after surgery [10].

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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