

Penile Wobble Effect: Proximal Corporal Deformities as a Cause of Penile Prosthesis Failure



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ABSTRACT

Introduction: Penile structural defects can contribute toward penile prosthesis (PP) surgical complications and suboptimal outcomes. Despite modern improvements in techniques of inflatable PP (IPP) surgeries, suboptimal outcomes arise secondary to unrecognized proximal corporal abnormalities.

Aim: To describe a new observation of IPP failure (wobbly penis) secondary to proximal corporal deformities.

Methods: We performed a retrospective analysis of the Johns Hopkins institutional database of patients who had IPP surgery from May 2006 to March 2017. All cases requiring surgical revisions secondary to proximal corporal deformities were identified. Exclusion criteria included patients who had incidentally discovered proximal corporal deformities intraoperatively or were documented preoperatively to have had a corporal defect.

Main Outcome Measures: Successful reimplantation of a functionally intact PP device.

Results: On clinical grounds, we identified 5 patients with properly cycling but unstable prosthetic devices that were associated with proximal corporal dilatation (proximally from the penoscrotal junction). All patients underwent reduction corporoplasty with prosthesis replacements consisting of controlled expansion IPPs. 3 patients had undergone previous device replacements because of intact cycling but unstable and unusable IPP devices, whereas 2 had a single previous device insertion. Mean age at revision was 67 years. Median IPP duration was 17 years. Median number of previous IPP surgeries was 3. All patients reported IPP stability and satisfaction after revision (median follow-up = 6 months).

Conclusions: Proximal corporal deformities could account for IPP failure. This condition can be under-recognized as observed in the present cases of multiple revisions with a normally cycling device that was not usable. Proper recognition of this problem allows the opportunity for surgical correction with reduction corporoplasty. **Rajih E, Burnett AL. Penile Wobble Effect: Proximal Corporal Deformities as a Cause of Penile Prosthesis Failure. Sex Med 2018;6:267–271.**

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Key Words: Tunica Albuginea; Corpora Cavernosa; Erectile Dysfunction; Corporoplasty

INTRODUCTION

Penile prosthesis (PP) surgery is the standard modality for management of erectile dysfunction (ED) that is refractory to conservative treatment measures. During the past 40 years, increasingly effective penile implants have been developed particularly because of improvements in manufacturing

properties of the inflatable PP (IPP).¹ Modern IPP devices serve to restore satisfactory erection and rigidity.² Penile structural defects such as fibrous plaques, distortions, and tunical erosions or ruptures can contribute toward IPP failure or suboptimal outcomes.³ Previous studies have addressed the physical aspects of the tunica albuginea of the corpus cavernosum that correlate with various deformities.^{4–6} An intact anatomic penile structure is required for IPP durability and survival.⁷

Our literature review yielded no report that describes the observation of an isolated proximal corporal deformity in patients who have had previous longstanding intact IPP devices. In the present report, we present a phenomenon of unstable function of an intact IPP device (wobbly penis) secondary to exclusively proximal corporal dilatation and describe definitive surgical management of this problem.

Received December 13, 2017. Accepted April 10, 2018.

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<https://doi.org/10.1016/j.esxm.2018.04.004>

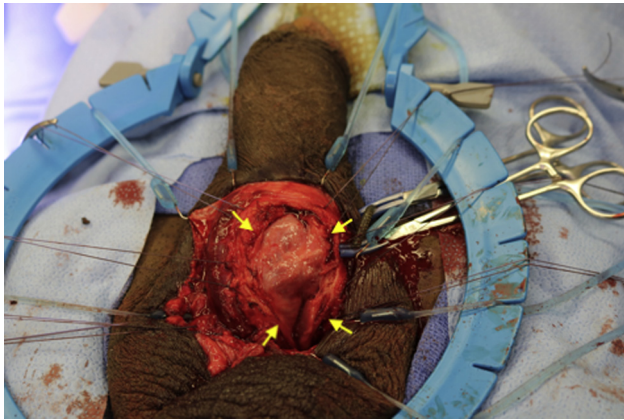


Figure 1. Photograph of intraoperative dissection shows left proximal corporal dilatation (arrows) before reduction corporoplasty. A penoscrotal approach is used.

METHODS

Patient Selection

After institutional review board approval, we searched our retrospectively collected database of PP surgeries for cases of proximal corporal deformity that were performed from May 2006 through March 2017 at the Johns Hopkins Hospital (Baltimore, MD, USA). The operative case records of the senior surgeon (A.L.B.) were reviewed. All cases of corporal reconstruction secondary to proximal corporal dilatation were recorded at the time of prosthesis revisions. Proximal corporal wall dilatation was assessed by preoperative clinical recognition of unsteadiness and/or mobility of cylinders inside the corpora cavernosa and intraoperative confirmation of distention and redundancy of the tunica albuginea. We excluded cases involving corporoplasty performed for proximal deformities incidentally discovered at the time of revision required for other reasons and for previously reconstructed corporal defect recurrences.

Perioperative Characteristics and Outcome Measures

Patient demographics and pertinent disease characteristics including presenting age, race, comorbidities, ED etiology based

on clinical evaluation and penile duplex ultrasonography, duration of IPP treatment, and number of previous IPP surgeries were recorded. Perioperative findings including laterality, previous and current IPP type(s), maximal stretched corporal body length, last IPP status, ability to perform sexual intercourse, and follow-up time were assessed.

Management Protocol

Reduction corporoplasty was done at the time of prosthesis device removal and replacement. A penoscrotal approach was used (Figure 1). After confirmation of proximal corporal wall dilatation, neurovascular bundles were mobilized and preserved at the corporal body base. Redundant tunica albuginea was excised along the ventrolateral aspect of the corporal body after calibration over a size 13 Hagar dilator. After excision, the corporal defect was closed with running and interrupted 3-0 polydioxanone (Ethicon, Inc, Bridgewater, NJ, USA) sutures with completion of the closure after reinsertion of the appropriately measured prosthetic cylinder. Irrigation with the Mulcahy salvage protocol was done before device insertion.⁸ At corporotomy closure, the prosthetic cylinder was inflated and inspected for alignment and stability. Replaced prosthetic devices were controlled expansion IPP devices (American Medical System [AMS] 700 Controlled Expansion, Minnetonka, MN, USA). IPP devices were activated 6 weeks after procedures.

RESULTS

We identified 5 patients with exclusively proximal corporal dilatation requiring prosthesis surgical revisions in the face of intact cycling but unstable IPP devices (wobble effect). All patients were unable to have penetrative sexual intercourse at presentation. Demographic and clinical variables are listed in Table 1. The mean age at the time of surgical reconstruction was 67 years (range = 56–77). The etiology of ED was veno-occlusive dysfunction in 3 patients based on penile duplex ultrasound study and secondary to retropubic radical prostatectomy in 2 patients. Most patients had multiple previous IPP surgeries with a median number of 3 revisions (range = 1–4). In

Table 1. Demographic and clinical characteristics

Patient	Age (y)	Race	Comorbidities	Etiology of ED	Previous therapy	Previous IPP surgeries, n	IPP duration (y)	Presentation with failure since last IPP surgery (mo)
1	72	AA	HTN, DSL, gout, depression	CVOD	PDE5i, IPP	1	3	10
2	77	AA	HTN, DSL, DM, arthritis	RRP	PDE5i, ICI, IPP	3	17	Immediate
3	63	CA	depression, epilepsy	CVOD	PDE5i, ICI, MUSE, IPP	3	18	Immediate
4	67	AA	DSL, IHD, DM	CVOD	PDE5i, ICI, IPP	4	31	Immediate
5	56	AA	none	RRP	PDE5i, ICI, IPP	1	5	14

AA = African American; CA = Caucasian; CVOD = corporal veno-occlusive disease; DM = diabetes mellitus; DSL = dyslipidemia; ED = erectile dysfunction; HTN = hypertension; ICI = intracavernosal injection; IHD = ischemic heart disease; IPP = inflatable penile prosthesis; MUSE = medicated urethral system for erection; PDE5i = phosphodiesterase type 5 inhibitor; RRP = retropubic radical prostatectomy.

Table 2. Operative findings

Patient	Last IPP status	Previous device measurements	Involved corpora	Explanted IPP	New device measurements	Reimplanted IPP	Follow-up (mo)
1	Intact	18-cm cylinders and 3-cm RTE	left	Alpha 1 Mentor	21-cm cylinders and 5-cm RTE	AMS 700 CX	24
2	Intact	unknown	bilateral	Alpha 1 Mentor	18-cm cylinders and 3-cm RTE	AMS 700 CX	7
3	Intact	18-cm cylinders and 4-cm RTE	bilateral	AMS 700 LGX	18-cm cylinders and 5-cm RTE	AMS 700 CX	6
4	Intact	21-cm cylinders and 2-cm RTE	right	AMS 700 CX	21-cm cylinders and 6-cm RTE	AMS 700 CX	6
5	Secondary aneurysmal dilatation	18-cm cylinders and 5-cm RTE	left	AMS 700 LGX	21-cm cylinders and 6-cm RTE	AMS 700 CX	2

AMS = American Medical System; CX = controlled expansion; IPP = inflatable penile prosthesis; LGX = length and girth expansion; RTE = rear-tip extender.

all cases involving prior revisions, wobble effect with an intact cycling IPP device was unrecognized with persistent device instability. 7 previous revisions consisted of 4 IPP replacements from mechanical failure and 3 from patient dissatisfaction.

Last IPP status was intact in 4 patients and prosthetic aneurysmal dilatation (uncontrolled IPP expansion) occurred in 1 patient, which developed over time after he elected to delay his surgery for 3 years after initial presentation with assessment of the wobble effect (patient 5; Table 2). All patients had previous placements of uncontrolled expansion IPP devices. In all patients, IPP expander effects were determined with respect to corporal length. The maximum stretched corporal length at the time of 1st implantation (available in 4 patients) was 22.5 cm (range = 21–24), and the median maximum stretched corporal length interval change was 4.5 cm (range = 3–5). The median maximum stretched corporal length at revision for all patients was 27 cm (range = 22–28).

The median follow-up time after reduction corporoplasty was 6 months (range = 2–24). All patients reported IPP stability and subsequent satisfactory sexual intercourse. No further complications or need for surgical revision were encountered.

DISCUSSION

We describe our case series of 5 patients with intact cycling but unstable IPP devices that constituted a “wobbly penis” phenomenon. This condition was recognized preoperatively at the time of clinical evaluation and confirmed intraoperatively to be exclusively proximal corporal dilatation, indicated by the dimensional discrepancy between the corporal cavity space and the prosthetic cylinder’s circumference. Surgical management consisted of reduction corporoplasty with replacement of IPP devices with a controlled expansion property. IPP devices were intact and functional at clinical follow-up.

Wobbly penis was recognized preoperatively based on clinical evaluation. Despite intact cycling devices, we observed cylinder unsteadiness and mobility inside the corpus cavernosum. Our clinical suspicion prompted surgical intervention. However, further clinical workup was done in patient 5 who had delayed intervention, thus worsening his condition. His later diagnostic evaluation by pelvic magnetic resonance imaging indicated proximal corporal dilatation and prosthetic aneurysmal dilatation, which was confirmed intraoperatively. It is reasonable to consider imaging studies such as magnetic resonance imaging adjunctively for complex presentations or after previous multiple revisions before revision surgery.

In this series, repeated IPP revision surgeries had been commonly performed without achieving optimal sexual function. 3 patients had prolonged time courses with multiple revisions by different implanters and presented with dysfunctional devices despite IPP revisions. Although speculative, we suspect that early detection of corporal deformity with

reduction corporoplasty might have averted repeated surgical failures in these patients.

Different prosthetic device features have been introduced to address assorted patient conditions, such as narrower prosthetic cylinders for corporal fibrosis and 2-piece inflatable devices for patients with previous pelvic surgery that hampers reservoir placement.⁹ Dilatation of the entire corpora cavernosa was a common complication of the uncontrolled expansion IPP, becoming one of the most common reasons for revision surgery in the 1970s. The newly introduced controlled expansion AMS 700 devices were designed to resist cylinder overexpansion and avoid corporal disfigurement. Furlow and Motley¹⁰ reported the successful use of controlled expansion devices in patients who had corporal dilatation secondary to prior uncontrolled expansion without performing corporal reconstruction. The corporal dilatations were not segmental as in our series, but they were obvious, involving the entire penis grossly at the time of physical examination. Before the introduction of controlled expansion triple-layer cylinders by the AMS vendor, implanters had wrapped a vascular graft as reinforcement around the prosthetic cylinder during revision surgeries for corporal dilatation secondary to overexpansion.⁹ Revision without graft reinforcement would contribute to secondary aneurysmal dilation of the newly implanted uncontrolled expansion device that filled the defective empty space within the corpora. In our study, we alternatively present surgical correction with reduction corporoplasty involving the proximal corporal body in addition to using a controlled expansion prosthetic device to avoid such complications.

The concept of cylinder oversizing was investigated by Zacharakis et al¹¹ in 10 patients with acute priapism who had undergone early insertion of a semirigid device at the time of presentation. After a period of 4.3 months, an exchange with an IPP device was performed. A mean gain of 1.3 cm in extra length was achieved at the time of device replacement. However, this study addressed the lengthwise stretching effect rather than the breadthwise dilatation effect exerted by a PP over a long period.

In addition to the effect of uncontrolled expansion devices, other sources of corporal body dilatation are possible. Excessive and aggressive corporal dilatation at the time of initial implantation can damage the sinusoidal spaces and intracavernous pillars that are fundamental structures for corporal body physical integrity.¹² It is also possible that intracorporeal pathophysiology is contributory. 3 of our patients had confirmed corporeal veno-occlusive dysfunction, which could have predisposed to corporal body structural weakness. The association between venogenic ED and histologic structural alteration has been supported by several previous studies, which showed significant decreases in number and abnormal architecture of intracorporeal elastic fibers compared with those of control groups.⁶ Abnormal tunica in conjunction with the repetitive expanding effect of IPP devices can result in dilatation of the corporal body over long intervals in predisposed individuals.

Our study has some potential limitations. We acknowledge the small number of cases, which could suggest our observation

of an unusual condition. Our series is retrospective and consists of patients presenting with dissatisfaction despite intact and normally cycling IPP devices. It is conceivable that some degree of corporal dilatation exists for many longstanding IPP devices that is not recognized and goes unnoticed despite patient dissatisfaction. Despite these limitations, we hope this report informs implanters about the existence of this abnormality and prompts their action to correct it if it is recognized.

Proximal corporal dilatation, manifest clinically as a penile wobble effect, is a penile structural defect that feasibly accounts for IPP failure. Longstanding IPP devices can produce these defects owing to their radial tissue expander effect, which affects prosthetic device structural support. Our finding suggests possible risk factors to be longstanding IPP implantation duration, uncontrolled expansion devices, and penile veno-occlusive disease. This condition can be under-recognized as observed in the present study in which multiple revisions were done, resulting in normally cycling devices that were not satisfactory for use. Proper recognition of this problem allows the opportunity for surgical correction with reduction corporoplasty.

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Conflicts of Interest: The authors report no conflicts of interest.

Funding: None.

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- (a) **Final Approval of the Completed Article**
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