

## SUPPLEMENT ARTICLE

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# Management of Perforation Injuries During and Following Penile Prosthesis Surgery

Doron S. Stember, MD,\* Tobias S. Kohler, MD, MPH,<sup>†</sup> and Allen F. Morey, MD<sup>‡</sup>

\*Urology, Icahn School of Medicine at Mount Sinai, New York, NY, USA; <sup>†</sup>Urology, Southern Illinois University School of Medicine, Springfield, IL, USA; <sup>‡</sup>Urology, UT Southwestern Medical Center, Dallas, TX, USA

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### ABSTRACT

**Introduction.** Distal extrusion of penile prosthesis cylinders is a challenging problem that is associated with pain and imminent erosion through penile skin. Distal extrusion and other perforation injuries, including crural and urethral, are other manifestations of tunica albuginea injuries that result in poor clinical outcomes and patient satisfaction.

**Aim.** A description of Dr. John Mulcahy's landmark article for management of lateral extrusion is presented along with discussion of techniques for managing other types of perforation injuries associated with penile implants.

**Methods.** Dr. Mulcahy's original article is reviewed and critiqued. Surgical methods to manage perforation injuries are discussed.

**Main Outcomes Measures.** The main outcome measures used were the review of original article, subsequent articles, and commentary by Dr. Mulcahy.

**Results.** Knowledge of techniques for management intraoperative and postoperative complications related to tunical perforation is necessary for implant surgeons.

**Conclusions.** Perforation injuries are challenging noninfectious complications of penile prosthesis surgery. Familiarity with techniques to manage these problems is essential for ensuring good outcomes and patient satisfaction. **Stember DS, Kohler TS, Morey AF. Management of perforation injuries during and following penile prosthesis surgery. J Sex Med 2015;12(suppl 7):456–461.**

**Key Words.** Penile Prosthesis; Lateral Extrusion; Distal Extrusion; Erectile Dysfunction; Crural Perforation; Surgical Complication

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### Introduction

Distal or lateral extrusion of penile prosthesis cylinders is a well-recognized and challenging complication following implant surgery for erectile dysfunction (ED) or Peyronie's disease [1]. Extrusion occurs when the distal tunica albuginea is weakened by one or more of the following factors: aggressive dilation, placement of a cylinder in too narrow a corporal cavity, or mechanical pressure from the cylinder [2]. Cylinder ends that have worn through the tunica albuginea are easily palpated immediately under the skin, most commonly in the lateral or ventral aspect of the

penis. Patients often complain of pain and express concern about imminent erosion. Dr. John Mulcahy published his technique for surgical repair of lateral extrusion in 1999 [3]. His method has been adopted as an elegant and effective approach that avoids the use of foreign material. Technique modifications have been developed since the original description (Table 1).

In addition to lateral extrusion, penile implant surgery is associated with other types of injuries related to perforation of the tunica albuginea. Proximal and urethral perforations are significant noninfectious complications that require surgical repair. Erosion of device component parts into

**Table 1** Techniques for Managing Lateral Extrusion

Author	Ref #	Year	n	Technique	Outcomes
Seftel et al.	[14]	1992	1	Synthetic graft material	0% infection rare
Levine et al.	[13]	1993	4	Synthetic graft material	0% infection rate
Jordan et al.	[12]	1994	7	Synthetic graft material	43% infection rate
Alter et al.	[5]	1995	2	Prefabricated tunica vaginalis flap	2 stage surgery required
Knoll et al.	[11]	1995	20	Synthetic graft material	30% infection rate with IPP + graft compared with 5% for IPP alone
Smith et al.	[10]	1998	5	PTFE distal windsock graft	0% infection rate; mean operative time 111 minutes
Mulcahy	[3]	1999	14	Distal corporoplasty	50% required additional fixation of hypermobile glans; 29% infection rate (successfully treated with salvage washout IPP exchange)
Carson and Noh	[8]	2000	28	Distal corporoplasty (18/28); Gore-tex windsock (10/28)	Corporoplasty: mean operative time 53 minutes, 0% infection rate. Windsock repair: mean operative time 90 minutes, 10% infection rate, 20% extrusion recurrence.
Shindel et al.	[16]	2010	6	Transglanular repair	Cylinder tip eyehole used to permanently fix device away from impending erosion side; small working space and brisk glanular bleeding presented challenge

IPP = inflatable penile prostheses; PTFE = polytetrafluorethylene.

adjacent organs or through skin also necessitates operative interventions. The ability to promptly recognize these problems, and familiarity with techniques to manage them appropriately, is critical to providing successful outcomes.

### Management of Lateral Extrusion

Lateral extrusion describes the relatively rare phenomenon of distal cylinder tips wearing through the tunica albuginea of the corpus cavernosum. Hsu and Brock have reported that the distal corporal tunica albuginea layer is thinner than the penile shaft tunica, particularly on the ventral aspect where most prostheses tend to extrude, suggesting an anatomic basis for this process [4]. Other possible causes of extrusion include oversizing the cylinders and overly vigorous distal dilation, especially with small caliber dilators [5]. Although semi-rigid rods have been associated with erosion because of the constant pressure they exert [6], comparative series have not found that rods have a higher complication rate compared with inflatable penile prostheses (IPP) [7,8].

Rates of extrusion and erosion have been reported at 1.2–8.0% [7,8]. The patient often complains of distal pain and erosion of the tip through the skin seems imminent on palpation. Patients' partners may complain of discomfort during receptive intercourse from the lack of tissue padding over the cylinder tip. Erosion of distal implant is a disastrous result since it requires the entire device to be removed. Exposed implant material renders the device infected by definition, even in the absence of clinical symptoms characteristic of infection.

Mulcahy described a technique for salvage of an infected implant by removing all device components, thoroughly washing out the component spaces with a series of antiseptic solutions, and then placing a new implant in the same setting [9]. Unlike other cases of infected implants that might be considered for salvage, salvage replacement is not a feasible option following erosion since a closed system that can be adequately irrigated is not present. Following erosion and explantation alone leads to significant scarring and fibrosis of the penile tissue. This process renders subsequent implantation extremely difficult and fraught with the possibility of complication, particularly since the distal tunica was abnormally perforated even before the erosion. For these reasons, it is critically important for implant surgeons to be familiar with maneuvers to manage lateral extrusion before erosion occurs.

In 1998, Smith et al. described a method for management of men with impending distal erosion [10] with polytetrafluorethylene distal windsock graft, a strategy which subsequently has raised concern regarding infectious complications. Knoll et al. reviewed 20 patients with cavernosal fibrosis who underwent prosthesis surgery and reported an infection rate of 30% in men who received a prosthesis along with synthetic graft material, compared with 5% in men who received a prosthesis alone [11]. In a much smaller series, Jordan et al. reported that three out of seven patients who underwent penile implant for phallic reconstruction with synthetic graft material had postoperative infection [12]. Although other series with grafting did not have any infections [13,14], the concern related to increased infection rates gave

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