

SURGERY

## Survey on the Contemporary Management of Intraoperative Urethral Injuries During Penile Prosthesis Implantation



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### ABSTRACT

**Background:** Intraoperative urethral injury is an uncommon event during the placement of a penile prosthesis, and alternative management strategies have been proposed with continuation of implantation after urethral injury.

**Aim:** To evaluate surgeon practices in the management of intraoperative urethral injury.

**Methods:** An online survey was sent to the society listservs of the Genitourinary Reconstructive Surgeons (GURS) and the Sexual Medicine Society of North America (SMSNA). Physicians were queried on their fellowship training, experience with penile prosthesis implantation, and management of urethral injuries during prosthesis placement. The response data were analyzed using SAS 9.4 (SAS Institute, Cary, NC, USA). The  $\chi^2$  test and Fisher exact test were used to determine associations between variables.

**Outcomes:** Survey responses.

**Results:** 131 survey responses were analyzed. Of the responders, 41.2% were GURS fellowship trained, 19.1% were SMSNA trained, 30.5% were non-fellowship trained, and 9.2% were trained in other fellowships. 25.4% of participants performed more than 50 implantations per year, 37.7% performed 20 to 50 per year, and 36.9% performed fewer than 20 per year. Urethral injury during prosthesis implantation was uncommon, with 26.2% reporting 0 injury, 58.5% reporting 1 to 3 injuries, and 15.4% reporting more than 3 career injuries. Injuries were most commonly encountered during corporal dilation (71.1%) compared with corporal exposure (12.5%) or penile straightening maneuvers (7.0%). There was no statistically significant difference with aborting or continuing implantation among GURS-trained, SMSNA-trained, other fellowship-trained, and non-fellowship-trained surgeons. Of all responders, 55% would abort the procedure after distal urethral injury, whereas 45% would continue the procedure with unilateral or bilateral insertion of cylinders. Patient factors that increased likelihood of terminating the procedure in the case of urethral injury included immunosuppression, spinal cord injury, and clean intermittent catheterization dependence.

**Clinical Implications:** A urethral injury during penile prosthesis implantation might not mandate termination of the procedure despite classic teaching.

**Strengths and Limitations:** The strength of this study is that it provides difficult to obtain epidemiologic data on the frequency and management of this clinically significant injury. Limitations include the inherent biases from a survey-based study including response bias and recall bias. The survey response rate could not be obtained.

**Conclusion:** Urethral injury during penile prosthesis implantation is a rare but clinically significant risk of the procedure, with many variations in management of the injury. Termination and delayed implantation might not be necessary after injury, although long-term outcome data are difficult to obtain. **Sexton SJ, Granieri MA, Lentz AC. Survey on the Contemporary Management of Intraoperative Urethral Injuries During Penile Prosthesis Implantation. J Sex Med 2018;15:576–581.**

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**Key Words:** Penile Prosthesis; Urethral Injury; Erectile Dysfunction

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## INTRODUCTION

The penile prosthesis is a highly effective surgical treatment for organic erectile dysfunction that is refractory to oral and injectable therapies.<sup>1</sup> The rate of overall complications during penile prosthesis implantation is low.<sup>2</sup> In particular, urethral injuries during implantation are uncommon, with an estimated incidence of less than 1% to 3%.<sup>2,3</sup>

Several risk factors have been identified that increase the risk of urethral injury during penile prosthesis implantation. Importantly, intracorporal fibrosis increases the risk of urethral injury, particularly during dilation of the corpora.<sup>4</sup> Fibrotic corpora can be seen in men with diabetes and in those who have used intracorporal injection therapy.<sup>5</sup> The more severe cases of fibrosis can be seen in men with a history of ischemic priapism and in men who have had an infected prosthesis removed without immediate replacement.<sup>5,6</sup> Urethral injuries also have been correlated with mechanical modeling during penile prosthesis placement for erectile dysfunction in the setting of Peyronie disease. The incidence of urethral laceration is approximately 4% in cases of intraoperative corporal modeling.<sup>7,8</sup> Injury is more common in cases with oversized cylinders or distal calcified plaques.<sup>9</sup> Trainee involvement has been identified as a risk factor for urethral injury. In 1 retrospective series of 504 implantations, urethral perforation was more common when a trainee was operating (3.7% rate in trainee implantations and 0.7% in consultant implantations;  $P = .17$ ).<sup>3</sup>

The infrequency of urethral injury during penile prosthesis implantation leads to variation in surgeon experience and the resultant variation in management of this injury. The conventional teaching is to perform primary repair, place a transurethral catheter, and abort the procedure. Recently, alternative management strategies have been proposed with continuation of implantation after urethral injury. This is supported by the observation that delayed implantation after aborted surgery can lead to postsurgical corporal fibrosis and difficulty in future placement of the implant cylinders.<sup>10</sup>

Given the paucity of literature on the subject and limitation of individual patient cohorts from which to draw conclusions, we sought to query a population of urologists most likely to encounter this injury. Reconstructive urologists who perform these surgeries can be fellowship trained through the Genitourinary Reconstructive Surgeons (GURS) or the Sexual Medicine Society of North America (SMSNA). However, fellowship training is certainly not required to implant prostheses and this procedure is commonly performed by general urologists. The primary objective of this study was to obtain epidemiologic data on the frequency of this injury and to evaluate the more common surgeon practices in management of the injury. We also were interested in elucidating whether those who theoretically have increased training in urethral reconstruction (ie, those who have completed fellowship training through the GURS or the SMSNA) decide to repair the urethral injury and

proceed with prosthesis implantation when a urethral injury is encountered.

## METHODS

Institutional review board exemption was granted for this study. An online anonymous survey through a 3rd-party survey company was sent to the society listservs of the GURS and SMSNA. A 12-question survey queried participants on their path of fellowship training, experience with penile prosthesis implantation and urethroplasty, prosthetic surgical approach, and experience with and management of urethral injuries during penile prosthesis implantation. The primary objective was to elucidate the common management strategies of the injury and assess the impact of fellowship training on method of repair. Secondary objectives included the association of number of penile implantations performed yearly with the number of career urethral injuries and management of the injury. We also queried the length of catheterization after urethral injury, time to reoperation (if indicated), and patient factors that affected management of urethral injuries. The response data were coded as binary variables and analyzed using SAS 9.4 (SAS Institute, Cary, NC, USA). The  $\chi^2$  test and Fisher exact test were used to determine associations between variables. Significance was assessed at an  $\alpha$  value equal to 0.05.

## RESULTS

131 survey responses were included in the analysis. Of the total responders, 41.2% were GURS fellowship trained, 19.1% were SMSNA fellowship trained, 30.5% were non-fellowship trained, and 9.2% were trained in other fellowships. 25.4% of participants performed more than 50 implantations per year, 37.7% performed 20 to 50 per year, and 36.9% performed fewer than 20 per year. Urethral reconstruction was a regular component of practice in 66.2% of respondents. Urethral injury during prosthesis implantation was uncommon, with 26.2% reporting 0 injury, 58.5% reporting 1 to 3 career injuries, and 15.4% reporting more than 3 career injuries. Injuries were most commonly encountered distally during corporal dilation (71.1%) compared with proximally during corporal dissection (12.5%) or penile straightening maneuvers (7.0%). For distal urethral injuries that occurred during dilation, 38.2% would repair the distal urethral injury, 64.9% would place a urethral catheter, 18.3% would place a malleable or inflatable cylinder in the non-perforated corpora, 55% would abort the procedure, and 10.7% would continue implantation with bilateral insertion of inflatable or malleable cylinders. For those who chose to abort the procedure, the next implantation was attempted within 6 weeks in 9.3%, within 6 to 12 weeks in 45.7%, and after 12 weeks in 41.1%. Certain patient factors increased the likelihood of aborting the procedure in the case of urethral injury, such as immunosuppression (61.1%), spinal cord injury (30.5%), and

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