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Current practice in the management of ischemic priapism: An anonymous survey of ISSM members

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Abstract

Penile shunting is the standard of care in management of ischemic priapism refractory (IPR) to non-surgical interventions. Due to high rates of impotence, corporal fibrosis, and loss of penile length, recent literature suggests these patients benefit from immediate penile prosthesis (PP) placement. An IRB-exempt anonymous electronic survey of the 2,168 members of the International Society for Sexual Medicine (ISSM) was conducted. The survey included demographic information, confidence and experience related management of IPR. The aim was to evaluate current practice patterns in management of IPR and to investigate the role of immediate PP implantation in the management of prolonged (>36-hours) IPR. The survey response rate was 11.6% (n=251). Most respondents were urologists (173), from the USA (49.1%), and had completed a fellowship in male sexual medicine, men's health, reconstruction, or andrology (71.1%). The majority (91.3%) see at least one case of prolonged priapism (>36 hours) that requires surgical management yearly. When looking at volume in training and after, our respondents had a significantly higher experience with penile prostheses (over 70%, >=10) as compared to shunts (less than 40%, >=10). Overall, 70.9% of respondents felt more comfortable with a malleable PP than a shunt. However, penile shunts are still preferred as the first line of surgical management by nearly 80% of respondents as compared to 12.7% who instead prefer a PP. We also found that under 40% of respondents currently use penile MRI or corporal biopsies in their management of prolonged assessment. This is the first study to assess current clinical practices in management of IPR globally. As in any anonymous self-reported survey-based

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Conflict of Interest

MG and RM have served as consultants for Coloplast. The authors declare no other conflict of interest

research, recall bias, sampling bias are an inherent limitation. Penile shunting for IPR continues to be the preferred treatment despite emerging data. Respondents performed PP surgery routinely and feel more confident placing PP than performing penile shunting procedures.

Introduction

Priapism is defined as a prolonged penile erection which is unrelated to, or persists after, sexual activity. Ischemic priapism is a urologic emergency with an estimated incidence of 5.3 per 100,000 men per year in the United States, accounting for 8 out of every 100,000 emergency department visits [1,2]. Ischemic priapism warrants prompt treatment in order to avoid fibrosis of cavernosal tissue and eventual erectile dysfunction [3]. Nonsurgical treatments such as aspiration and irrigation of the corpora cavernosa or intracavernosal injection of sympathomimetic agents are the preferred first step [3]. If nonsurgical management fails, the AUA recommends performing a distal penile shunt to achieve penile detumescence [3]. However, emerging data on the role of penile prostheses in the management of prolonged (>36 hours) ischemic priapism has resulted in a 'strong' recommendation by the European Association of Urology[4,5].

The aim of this study was to evaluate current urologic practice patterns regarding the management of ischemic priapism and secondarily, to investigate the role of immediate penile prosthesis implantation in the management of prolonged (36-hours) ischemic priapism. In addition, we investigated urologists' level of confidence in placing penile prostheses compared to performing penile shunts. We also assessed regional differences in both practice patterns and confidence with these procedures.

Materials and Methods

After obtaining an IRB exception, an anonymous 28-question survey was distributed to all 2,168 members of the International Society for Sexual Medicine (ISSM) using REDcap. The survey included anonymous demographic information, primary practice focus, the amount of experience participants had with penile prostheses, and level of confidence related to the procedures used in the management of priapism (Appendix 1). All participants were required to provide anonymous consent prior to starting the survey. Study data were collected and managed using REDCap electronic data capture tools [6]. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. Descriptive analyses were performed, and chi-square test was used to determine association between categorical variables. All statistical analyses were done using SPSS v22 (IBM, Armonk, NY).

Results

The survey was sent to 2168 members of the ISSM and 11.6% answered it. 173 respondents who consented, were confirmed to be urologists, and had completed the surveys sufficiently

were used for further analysis. Most respondents were from the United States (49.1%; Table 1), with fellowship training in male sexual medicine, men's health, reconstruction, or andrology (71.1%). 42% of the respondents had completed their training in the last 10 years (Table 2). The focus of the practice with regards to urologic subspecialties is shown in Table 3.

The vast majority of respondents (91.3%) see at least one case of prolonged priapism (>36 hours) that requires surgical management each year. Penile MRI and corporal biopsies are performed in 34.7% and 35.1% respectively in cases of prolonged ischemic priapism. A third (32.9%) of respondents performed over 50 penile prostheses during their training, but almost half (43.4%) performed less than 5 penile shunts during their training. Using a volume of 10 procedures, we found that majority of our respondents had a high volume of prostheses experience (78.0% during training and 71.7% after training) while respondents had a significantly smaller experience with shunts (23.1% during training and 39.3% after training). 87.3% of respondents place penile prostheses as part of their current practice, although the number placed per year is highly variable. When analyzed by region, 50% of North American respondents were found to have placed over 50 prostheses during their training while the larger proportion of respondents in other regions were found to have placed only between 0–10 prostheses a year (Figure 1).

Regarding the management of ischemic priapism, penile shunts are first line surgical management for nearly 80% of respondents, while 12.7% prefer a penile prosthesis (Figure 2). No significant association was observed between penile prosthesis placement as the next step in management in relation to fellowship training, or practice type. Nearly 80% of respondents feel very confident in performing aspiration or irrigation for priapism (Figure 3). Only 12.1% of respondents felt minimally or not at all confident while performing a percutaneous penile shunt (e.g Winter or T-shunt in the ER or clinic), and 17.3% with operative distal penile shunts (e.g. Al Ghorab in the OR) while approximately 6–7% of respondents felt minimally or not at all confident using prostheses. When tested against each other, overall 70.9% of respondents felt more comfortable with a malleable penile prosthesis than a penile shunt ($p < 0.1$) with no differences seen with regards to region, fellowship, or practice type. In addition, when electing to place penile prosthesis for priapism, the majority of respondents would wait over 2 weeks prior to surgery (Figure 4).

Discussion

Prolonged ischemic priapism (>36 hours) is associated with poor erectile function recovery due to irreversible cellular damage and necrosis, which has been documented in both animal and human studies [7–10]. Historically, prolonged ischemic priapism refractory to non-surgical treatments has been managed with penile shunting. These procedures are associated with high reoperation rates, poor erectile function recovery, and rare but severe complications [11–13]. Penile shunting surgical outcome studies are limited, old, descriptive (technique papers), with small number of patients, and have rarely used validated instruments to assess erectile function [14–17]. Zacharakis et al. reported that in 28 patients with a duration of priapism greater than 48 hours, 100% had severe ED despite having a T shunt and snake maneuver performed, and all of them eventually required a penile prosthesis

[18]. In addition, management of severe ED resulting from prolonged priapism with penile prosthesis is technically challenging due to severe corporal fibrosis and is associated with poor satisfaction rates (60% vs 96%), significant penile shortening (40% vs 3%), higher revision rates (27% vs 9%), high infection rates (19% vs 7%), increased rates of erosion (4% vs 0%), and malfunction (4% vs 0%). [19,20].

Although penile prosthesis placement for priapism was described as early as 1989, recent developments have emphasized the significant advantages of early penile prosthesis placement in prolonged IPR [19–24]. Early prosthesis placement prevents post-priapism corporal fibrosis, subsequent penile shortening, associated lower satisfaction rates, long-term sexual dysfunction, and consequently the resultant prolonged treatment course [25–27]. Ralph et al reported on 50 patients presenting for priapism refractory to conventional treatment, who underwent immediate penile prosthesis placement[22]. 96% of patients were “fully satisfied” with the surgery, and 84% “regularly” had intercourse. Regarding complications, 6% of patients had infections – higher than the rate for virgin prostheses, but still lower than the rate for delayed prosthesis insertion. 24% of patients had revision surgery, but half of these were only to replace a malleable implant. Of note, all patients in that study had necrosis confirmed on histology. An immediately-placed temporary malleable prosthesis can be used to maintain penile length for subsequent insertion of an inflatable device if patients should desire a more natural erection in the future.

For these reasons, placement of penile prosthesis in cases of prolonged ischemic priapism is becoming more popular among surgeons. The European Association of Urology guidelines currently gives a ‘strong’ recommendation for primary penile implantation in cases of prolonged priapism (> 36 hours) or in cases refractory to non- surgical management. Interestingly, American Urological Association guidelines for priapism do not mention prostheses as an option in this setting [3,5]. In our opinion, penile prosthesis placement in cases of prolonged priapism (>36 hours) refractory to non-surgical management should be the treatment of choice due to: 1) poor erectile function recovery after penile shunts or prolonged ischemia, 2) difficult penile prosthesis placement in the setting of priapism induced corporal fibrosis, 3) high complication and dissatisfaction rates in cases of delayed penile prosthesis placement after prolonged priapism, and 4) limited penile shunt outcome data, 5) limited penile shunting surgical training during residency, and 6) low levels of confidence when performing penile shunt surgery.

As it currently stands, urologists continue to favor shunts as the first step after non-surgical management of priapism in an attempt to salvage any residual erectile function. In our study, most practitioners who are comfortable with penile prosthesis insertion wait for over 2 weeks prior to insertion, even if the patient has failed all prior shunting procedures. We observed significant variability in the time point at which they would consider placement of a penile prosthesis. Given the time-dependent relationship between duration of priapism and likelihood of erectile dysfunction and long-term complications, this clearly demonstrates the need for research on the timing of irreversible penile dysfunction due to priapism. This might potentially reflect a patients decision to wait or a surgeons’ optimism of return of erectile function with the treatment of the acute priapic episode using other non-prosthetic measures, although leaving them with potentially increased complications associated with

delayed implantation as discussed earlier. However, implantation in a delayed manner does offer the surgeon an approach to pre-emptively address the expected ED while giving the patient adequate time to consider their options and recover from the acute episode. Regardless, surgeons need to be able to provide patients with a more comprehensive understanding of prognosis and thus better counsel them regarding options and expectations. MRI has shown to be a good measure of viable tissue and is concordant with histological analysis from tissue biopsy[10]. Improved utilization of MRI and corporal biopsy could potentially lead to a more effective clinical management pathway and better patient outcomes. Furthermore, although immediate prosthetic implantation is an increasingly accepted treatment option for episodes over 72 hours, better methods for ascertaining tissue viability can potentially improve outcomes in patients with shorter episodes. Continued research with regards to technique and long-term outcomes will continue to modify the guidelines to successfully managing priapism. Though most urologists are comfortable with conservative management aspects such as irrigation, aspiration and phenylephrine injection, we observed decreases levels of comfort with shunts as compared to prostheses implantation. It can be hypothesized that this difference in level of comfort was due to the differential level of training and experience we observed in our data.

The current work has certain limitations that are worth discussing. As in any anonymous self-reported survey-based research, a certain degree of recall bias is an inherent limitation to the study design that may be more pronounced in participants who are further out from their training. In addition, in any survey, the respondents may not be representative of the entire population. Our response rate of 11.6% is in line with other studies of this type [28–32]. Our participants were selected using professional society membership, and thus represent urologists who participate in professional societies and might not be generalizable to all providers managing IP. The ideal study would have questioned all practicing urologists, of all subspecialties. Since members of ISSM likely manage priapism more commonly than other subspecialties, their practice patterns with this condition are likely more current. As such, any variability may be even higher in the general urologic practice.

A few hurdles persist to early penile prosthesis placement in prolonged priapism. First, the exact timing at which erectile dysfunction is inevitable is still not clear. Secondly, society guidelines do not uniformly recommend prosthesis placement in this setting. In addition, insurance coverage for penile prostheses in general, and in the acute setting, may be prohibitive. The biggest hurdle is potentially patients' agreement with this treatment plan. Explaining to a patient who may have had normal erections beforehand that he may never have them again is a daunting task. Additionally, convincing them that their erectile dysfunction is so inevitable that an immediate prosthesis is necessary is even more challenging. Many patients may be reluctant to accept this, and some may opt for shunting in the unlikely event that they recover function. As a result, they may not be convinced that a prosthesis is necessary. Until further research can demonstrate to patients that the necessity for prosthesis is inevitable, providers will continue to face this challenge.

Conclusions

Despite emerging data supporting penile prosthesis insertion, penile shunting continues to be the preferred treatment for prolonged IP refractory to non-surgical management. Respondents performed penile prosthetic surgery routinely and were more comfortable with this as compared to shunting. Further research on timing of consideration of penile prosthesis implantation, long-term outcomes, complications, and quality of life might allow clearer guidelines regarding the incorporation of penile prostheses into the current treatment paradigm for IPR.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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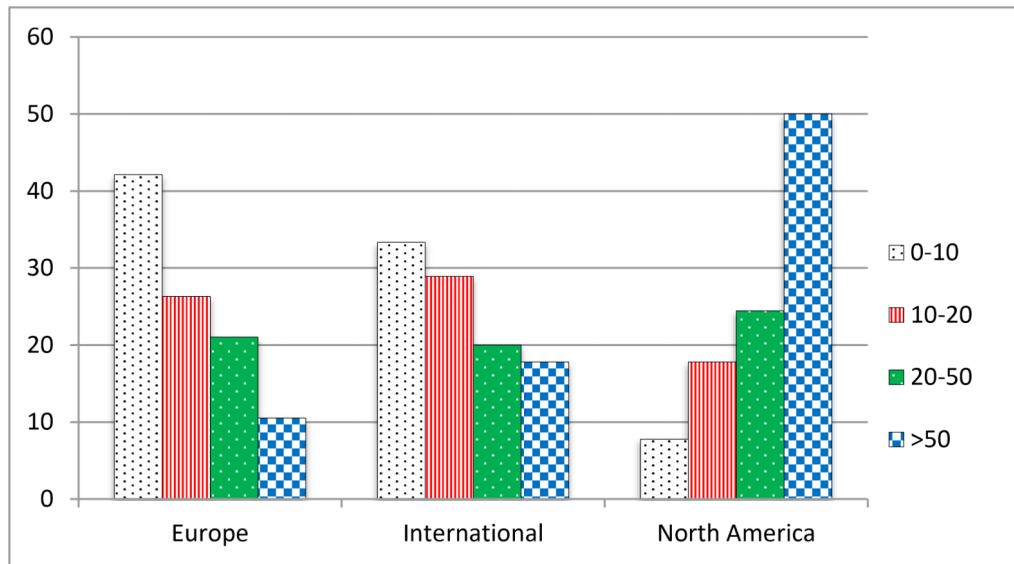


Figure 1:
Penile prosthesis volume in training by region

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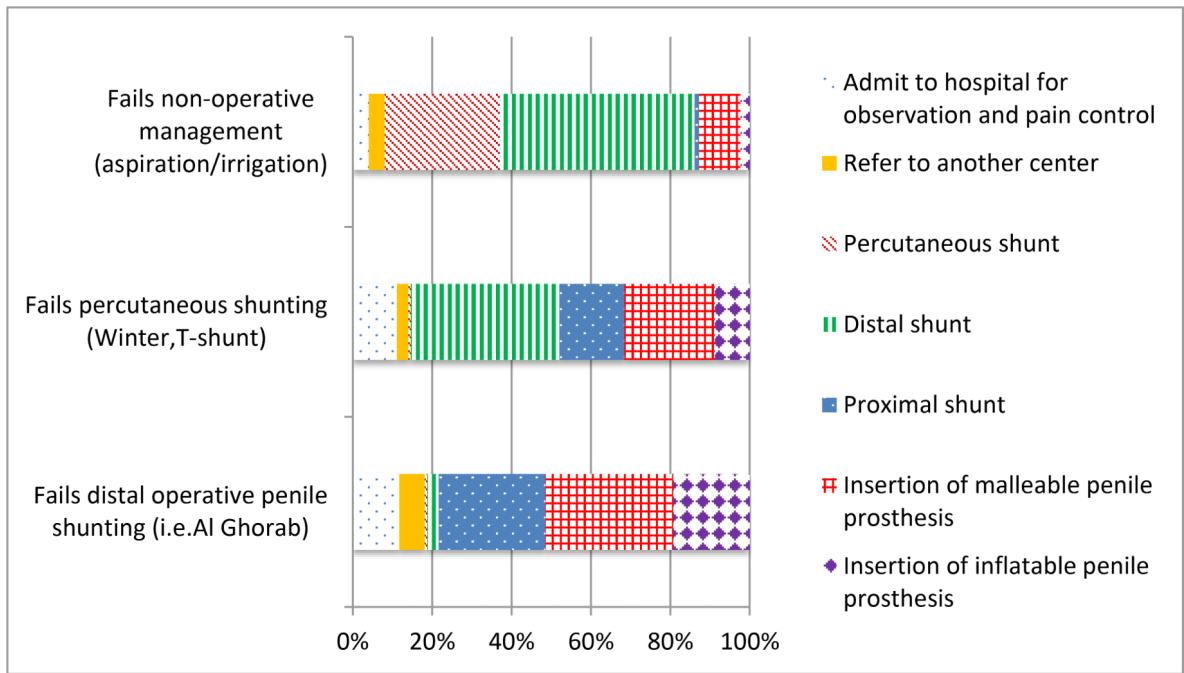


Figure 2:
Next step after non-operative management

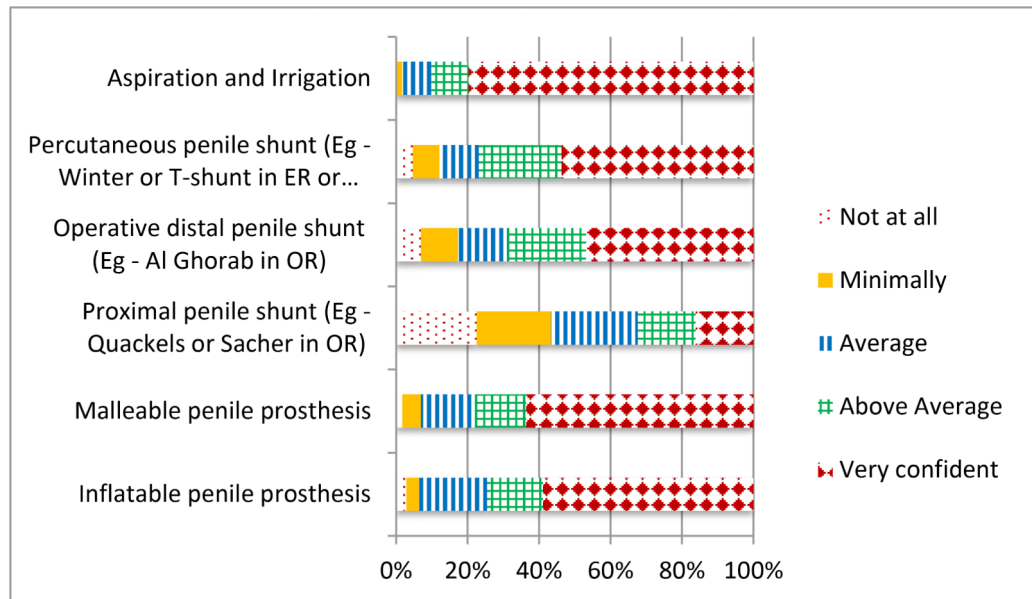


Figure 3:
Confidence with different procedures

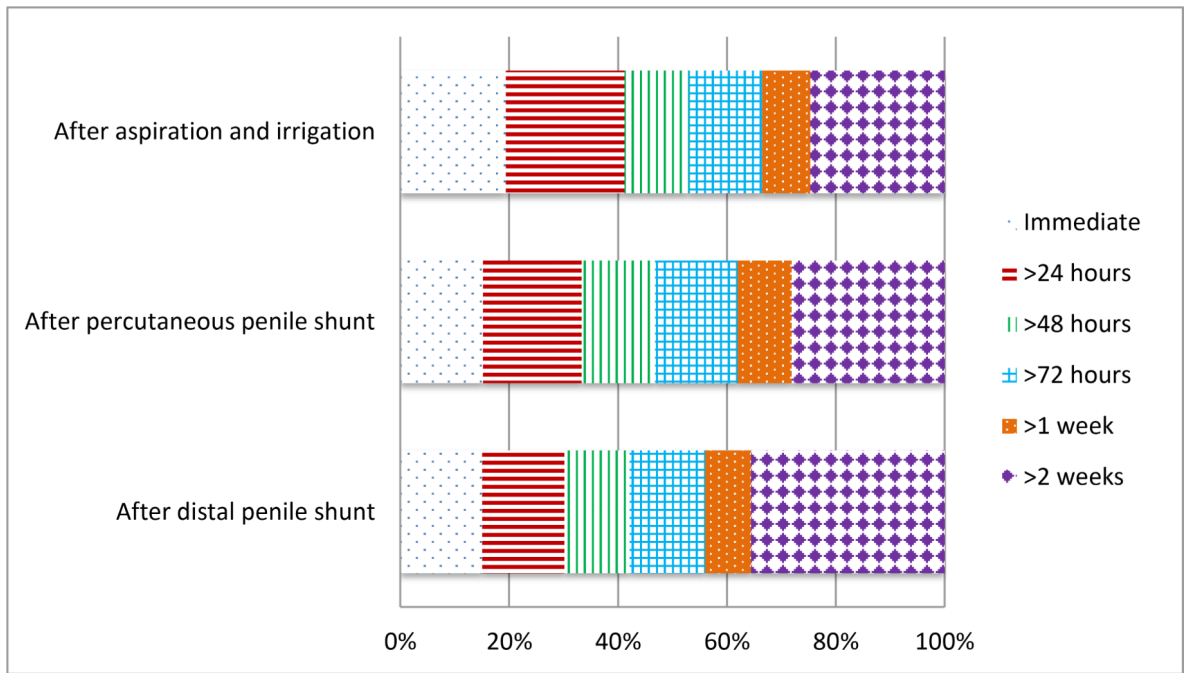


Figure 4:
Time to prosthesis if next step

Table 1:

Region of respondents

Region	Country	n	%
North America		90	52
	USA	85	49.1
	Canada	4	2.3
	Mexico	1	0.6
Europe		38	22
Other		45	26

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Table 2:

Year of completion of respondents' training

Year finished/finishing training	N	%
>2018	4	2.3
2009 – 2018	73	42.2
1999 – 2008	32	18.5
1989 – 1998	31	17.9
1979 – 1988	25	14.5
< 1979	8	4.6
All	173	100%

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Table 3:

Subspecialty / Focus of practice

Urologic subspecialty	N	%
General Urology	56	32.4
Oncology	18	10.4
Endourology/Stone Disease	1	0.6
Female Pelvic Medicine and Reconstructive Surgery	7	4
Erectile Dysfunction	153	88.4
Infertility	87	50.3
Male Genitourinary Reconstruction	43	24.9
Robotic/Laparoscopic Surgery	13	7.5

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