SEXUAL MEDICINE REVIEWS REVIEW

Comparison of Infrapubic vs Penoscrotal Approaches for 3-Piece Inflatable Penile Prosthesis Placement: Do We Have a Winner?

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ABSTRACT

Background: The 3-piece inflatable penile prosthesis (IPP) is the gold standard treatment for male erectile dysfunction when other less invasive approaches are contra-indicated or unacceptable for the patient. There are currently 2 surgical approaches for IPP implantation: the penoscrotal (PS) and the infrapubic (IP) incision.

Aim: To assess the most recent evidence on the impact of surgical approach for 3-piece IPP implantation in patients with erectile dysfunction.

Methods: A systematic literature review was performed using the MEDLINE (PubMed) and Cochrane Libraries databases in November 2017 to identify all studies investigating 3-piece IPP with a specified surgical access.

Outcomes: The following key words were used in combination: "infrapubic," "transcrotal," "penoscrotal," "peno-scrotal," and "penile prosthesis." Additional references were obtained from the reference lists of full-text manuscripts. We used a narrative synthesis for the analyses of the studies.

Results: 22 Studies reporting data on 3-piece IPP implantation with a specified surgical approach were found in the literature. While IPPs are most commonly positioned through a PS incision, the IP approach is a faster procedure. No cases of glans hypoesthesia after IPP placement with an IP approach were reported, and the overall peri-prosthetic infection rate was 3.3% or less. Patient satisfaction rates were higher than 80% in both groups.

Conclusions: Both the IP and PS approaches are viable and effective strategies for a 3-piece IPP placement, and result in high satisfaction rates. To date there is no evidence that an incision strategy may reduce infection rates. Penile sensory loss following an IP approach remains a virtual risk. It is recommended that the surgeon executing the implant have knowledge of both accesses and be capable of tailoring the incision strategy for complex cases. The chosen method should be based on the patient's specific anatomy, surgical history, and surgeon experience. **Palmisano F, Boeri L, Cristini C, et al. Comparison of Infrapubic vs Penoscrotal Approaches for 3-Piece Inflatable Penile Prosthesis Placement: Do We Have a Winner? Sex Med Rev 2018;XX:XXX–XXX.**

Key Words: Erectile Dysfunction; Penile Prosthesis; Infrapubic; Penoscrotal; Impotence; Penile Implant

INTRODUCTION

Erectile dysfunction (ED), the most common sexual disorder after pre-mature ejaculation, is defined as the inability to obtain or maintain a penile erection sufficient for successful vaginal intercourse.[1,2] ED is associated with aging and has an incidence between 2–28.9% in men between 30–39 years of age and 41.9–83% in men ranging from 70–80 years old.[3] ED has an important impact on a man's sexuality and quality of life, but also affects the woman partner's sexual life.[4]

Solid evidence from several studies has linked the development of ED to diabetes mellitus, hypertension, hyperlipidemia, metabolic syndrome, depression, and lower urinary tract symptoms.[5–12] Iatrogenic ED following pelvic surgery is also extremely common. Radical prostatectomy, even when a bilateral nerve-sparing technique is applied, is associated with an incidence of ED of up to 44%.[13,14] Moreover, when a non-nerve-sparing procedure is the only feasible option, sexual potency is preserved in only 0–17% of patients.[15]

Phosphodiesterase type 5 inhibitors (PDE5-Is) are the first-line treatment option for ED.[1] In case of PDE5-I failure,

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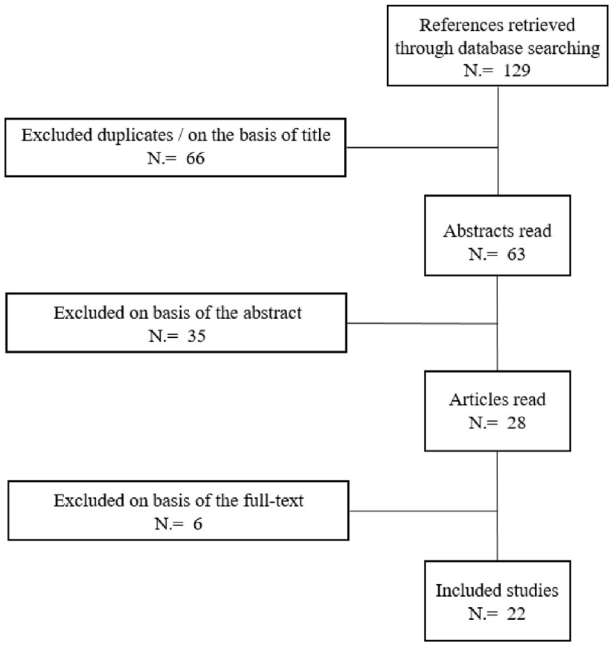

Figure 1. Flow diagram of the search results.

intra-cavernous injection, vacuum devices, or intra-urethral alprostadil are options to be considered.[16] Medical therapy can help improve quality of life and erectile function, but unfortunately the literature describes a drop-out rate of up to 80%.[17,18]

Surgical implantation of an inflatable penile prosthesis (IPP) offers an effective and reliable solution to definitively treat ED in patients refractory to less invasive therapies such as oral PDE5-Is, intra-cavernous injection therapy, intra-urethral administration of alprostadil, and the vacuum erection device.[16] Despite the invasiveness of the IPP implantation procedure, as compared to other therapeutic options, the reported satisfaction rates vary between 75−100%.[19]

In this context, 3-piece IPPs are the most frequently implanted devices for the treatment of ED in the United States.[20] Over the years, 5 surgical approaches for penile prosthesis implantation have been described; 2 are of historical interest and 3 remain current. The suprapubic approach, no longer used today, was performed in the early days of IPP, before the development of kink-resistant tubing, because it permitted long loops of tubing to be routed through the fascia to avoid kinking.[21] In 1975, Small et al[22] described a perineal approach for the implantation of the semi-rigid penile rod prosthesis that bears their name. Again, this strategy remains only of historical interest. Of the 3 remaining approaches, a sub-coronal approach with a de-gloving of the penis to the level of the penoscrotal (PS) junction has been recently described for the implantation of IPP with reportedly good outcomes.[23] In this context, although some surgeons are capable of performing all 3 of these approaches for IPP implantation, the infrapubic (IP) and the PS are the 2 most widely implemented approaches. Each incision has its own unique strengths and weakness and the choice of surgical access for IPP is still based on the surgeon's experience in most cases.[24]

Advantages of the IP approach include a more rapid device placement and direct visualization during reservoir insertion. Disadvantages may include difficulty with pump placement, limited corporal exposure, and an increased risk of injury to the sensory nerves of the penis.[25] On the other hand, PS incision improves corporal exposure and the ability to secure the pump in the dependent portion of the scrotum, and involves only minimal risk of nerve damage.[25]

The aim of this narrative review is to give a comprehensive overview of the most recent evidence comparing the advantages and disadvantages of the PS and IP approaches for IPP implantation.

METHODS

A MEDLINE, Cochrane Library, and National Center for Biotechnology Information PubMed search for relevant published articles was performed by combining the following key words: "infrapubic," "transcrotal," "penoscrotal," "peno-scrotal," and "penile prosthesis." For the MEDLINE search, we used the following filters: languages (English), species (humans), text availability (full text availability). No filters were applied for the date of publication. Subsequently, the references of the retrieved articles were also used to identify any other relevant studies. Each article and abstract was reviewed for its appropriateness and relevance to the topic of this review.

2 Reviewers (F.P. and M.G.S.) independently screened all abstracts and full-text articles. Disagreements were resolved by discussion, and where no agreement was reached, a third independent reviewer (F.G.) acted as an arbiter.

To be included, studies had to explicitly investigate 3-piece IPP specifying the surgical access (Figure 1).

RESULTS

22 Articles concerning IP and PS approaches for IPP placement were identified in the literature search. These included 4 prospective studies[25−28]; 1 randomized trial[29]; 3 retrospective studies[30−32]; 1 original article based on survey results[33]; 5 systematic reviews[20,34−37]; and 8 notes regarding surgical technique/expert comments.[38−45]

Worldwide Diffusion of IP and PS Technique

6 Studies reported the prevalence of IP and PS approaches during IPP placement.[25,28,30−33] The Allegheny University group reviewed 360 primary implants reporting IP and PS approaches in 38.6% (139/360) and 61.4% (221/360) cases, respectively.[30] Garber[31] reported a series of 442 primary and secondary IPPs of which 154 (34.8%) were performed with an IP approach and 288 (65.2%) with a PS incision. Karpman et al,[28] in a prospective multi-centric study, analyzed data from 848 patients with ED who underwent IPP implantation in 11 centers and showed that 158 (18.6%) men were treated with an