Surgical Technique to Maintain Penile Length After Insertion of an Inflatable Penile Prosthesis via Infrapubic Approach

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ABSTRACT

Introduction. The aim of this study was to provide an overview of the principal author's experience in maintaining penile length after implantation of a three-piece inflatable penile prosthesis (IPP). For many patients with erectile dysfunction, who choose surgical treatment, loss of penile length after implantation of an IPP is a common concern. In the principal author's experience, release of the suspensory ligament during IPP implant surgery can maintain penile length, alleviating this concern.

Methods. After implantation with an IPP, the principal author released the patient's suspensory ligament.

Main Outcome Measures. The main outcome measure was patient satisfaction with penile length after IPP surgery. A second outcome measure was a substudy measuring the patient's penile length after IPP implantation both before and after suspensory ligament release.

Results. From August 1997 through September 2002, the principal author implanted a total of 303 Alpha 1 IPPs into men who suffered from erectile dysfunction (ED). All had their suspensory ligament released. Postoperative complications were minimal and for the most part transitory. Ninety-three percent reported satisfaction with IPP performance, penile length, and willingness to undergo the IPP surgery again. None of the patients reported penile shortening, with some of them reporting an increase in penile length, as compared with preoperative measurements.


Key Words. Penile Prosthesis; Genital Lengthening/Girth Enhancement Surgery; Male Erectile Disorder

Introduction

Three-piece inflatable penile prosthesis (IPP) implantation is a standard technique of treating men with erectile dysfunction (ED) unable to be managed using conservative, nonoperative strategies [1–8]. The aim of this study was to provide an overview of the principal author's (F.B.) experience in maintaining penile length after implantation of a three-piece IPP. For many patients with ED, who choose surgical treatment, loss of penile length after implantation of an IPP is a common concern [9,10]. In this article, the principal author evaluates his experience in maintaining penile length after surgical release of the suspensory ligament.

Methods

All patients presented to the principal author had failed more conservative treatment such as Viagra, vacuum devices, and injection therapy. After medical examination, patients had testosterone level evaluation and penile Doppler ultrasound, to confirm that the cause of their ED was physical.
Patients were implanted with the Alpha 1 IPP, with the lockout valve reservoir (Mentor, Santa Barbara, CA, USA) [11,12]. Patients had their Alpha 1 implanted via an infrapubic approach with a transverse incision and insertion of the reservoir under direct vision. The corporotomy incision was performed laterally in the corpora, at about 2 and 10 o'clock, with a scalpel. To avoid any risk of getting too close to the neurovascular bundle of the penis, the tubing was positioned laterally.

The incision was performed as proximally as possible. The corpora was then dilated proximally and distally through the incision. Once the corpora was irrigated, the cylinders were inserted, with rear tip extenders, if necessary. The pump was placed in the most dependable portion of the scrotum, toward the medical raphe. No sutures were used to keep the pump in place. Figure 1 demonstrates the proper placement of the three-piece IPP.

As presented in Figure 2, once all three components of the device were implanted, the device was inflated, and the fundiform ligament was incised. This was accomplished by inflating the penile implant and then pressing down on the penis. This allowed easy identification of the fundiform ligament, which was then incised away from the neurovascular bundle. This then allowed visualization of the suspensory ligament. With downward finger pressure away from the pubis, using a long-tipped Bovie cautery, the suspensory ligament was incised, detaching it from the pubis, but not the crura. The incision was performed away from the neurovascular bundle, with the rest of the displacement of the penis away from the pubis performed by blunt finger dissection. In this way damage to the neurovascular bundle is avoided.

Using the modified Mulcahy irrigation technique, excessive irrigating solution was then aspirated [13]. A JP drain #10 was inserted through a contralateral stab wound above the infrapubic incision, and fixed to the skin with Prolene. The wounds were then closed with two layers of previously placed interrupted sutures of 2-0 Vicryl plus subcuticular 4-0 Monocryl and Steri-Strips.

Foley catheters were not used during this procedure. To reduce bleeding, mild pressure was applied with Kling gauze around the shaft of the penis. The patient was left with the IPP inflated between 50% and 70%. This was done to make it easier for the patient to apply downward pressure after surgery, maintaining the distance from the base of the penis to the pubis. Additionally to prevent reattachment of the suspensory ligament to the pubic bone, the patient is advised to leave the implant partially inflated, if the patient can tolerate the discomfort. Following these instructions is important to maintain penile length postoperatively.

Most of the patients went home on the same day or the next morning. If drains were used, the patient returned the next day for removal of the JP drain.

Patients were sent home with antibiotics and instructed to take them for a period of between 7 and 14 days, with the duration depending on the patient's preoperative history. For pain, anti-inflammatories were provided. Additionally, patients were instructed to use ice packs for the first 24-48 hours to reduce the swelling and then 3 or 4 days postoperatively, hot baths.
A subset of patients completed a satisfaction questionnaire, which asked the patient three questions, to which he answered Yes or No:

1. Are you satisfied with your penile implant?
2. Are you satisfied with your penile length?
3. Would you have this IPP surgery again?

The questionnaire was provided to the patient while in the waiting room or in the examination room, prior to the patient being seen by the principal author. The patient marked his answers on the form, and then gave it to the nurse. While the patient completing the form was not anonymous, the nurse reviewed the form only to insure all questions had been answered.

In a second substudy, the principal author measured patient's penis in the flaccid state and stretch position before the operation. Postoperatively, penile measurements were also taken, with the penile implant inflated and deflated, both prior to and after suspensory ligament incision. The measurement was obtained by placing a ruler on the top of the penis and recording the distance, to the nearest millimeter, from pubis to the tip of the glans.

**Main Outcome Measures**

The main outcome measure within this study was penile length measurement, both before and after IPP implantation. This measurement allowed quantitative assessment of the treatment to maintain penile length.

**Results**

From August 1997 through September 2002, the principal author implanted a total of 303 Alpha 1 IPPs into men who suffered from ED. Indications for surgery included prostatectomy, Peyronie's disease, diabetes, hardening of the arteries, and penile fibrosis.

Table 1 details the complications that occurred in these 303 patients. Complications included six cases of device infection, three due to *Staphylococcus aureus* and three due to *Staphylococcus epidermidis*. Four of those patients were treated successfully with a salvage procedure. Two patients had superficial *S. aureus* infection that was treated successfully with intravenous antibiotics.

Of the 30 patients (9.9%) who had Peyronie's disease preoperatively, two had distal perforation of the urethra postoperatively, after modeling per Wilson's technique [14,15]. One of these patients had the perforating cylinder removed and was satisfied with the one remaining cylinder. The second patient was successfully treated with removal and replacement of the penile implant 3 months later. One patient had acute tubular necrosis, probably due to the antibiotic regimen. The necrosis resolved spontaneously without treatment. One patient had cylinder fluid loss. Upon exploration, there was a needle prick distally, that probably occurred when SST (drooping glands) deformity correction was performed at the time of the original implant. One patient had chronic paraphimosis, which was corrected by circumcision. Approximately 12 patients had difficulty in achieving orgasm. Most of these cases resolved spontaneously, but a few of these patients had borderline low testosterone levels, and testosterone therapy allowed them to achieve orgasm. One patient had a partial wound dehiscence and was reoperated upon to close the wound. We did not have any patients complaining of penile numbness or lack of sensation. Four patients stated that they thought their penis was shorter as compared with preoperative, but these patients were still satisfied with their surgical outcome. There were no cases of autoinflation. There were no cases of postoperative curvature of the erect penis or instability (e.g., buckling) of the erection.

In the satisfaction substudy, 98 patients completed the satisfaction questionnaire. Of those patients, 91 (93%) reported satisfaction with IPP performance, penile length, and willingness to undergo the IPP surgery again.

Eighteen patients were included in the penile measurement substudy. Both the flaccid and stretched penile measurements showed an increase from preoperative to postoperative. The flaccid penis measurements increased 2.43 cm (range 1.4–3.2 cm), from 8.57 cm preoperatively to 11 cm postoperatively. After IPP implantation, the erect measurement increased 1.73 cm (1.1–2.2 cm).
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from 10.71 cm to 12.44 cm, after suspensory ligament incision. No sub-study patients had a shorter penis preoperative to postoperative.

Conclusion

In performing IPP surgery on this cohort of patients, it was determined that the best way to incise the suspensory ligament is after the insertion of the penile implant. An inflated device allows the penis to be easily pressed down, aiding in identification of the corpora structure and the neurovascular bundle, and in this way avoid any possible damage to the neurovascular bundle, while incising the suspensory ligament.

As demonstrated in this cohort of patients, insertion of a penile implant with concomitant incision of the suspensory ligament minimizes the risk of phallic shortening with excellent satisfaction of the patient. This is in contrast to some studies going up to 30% with patients complaining of shortening of the penis [9,16].

While this was a single-surgeon study, and the penile length substudy did not have a large number of patients, the findings warrant further investigation on this subject that is so important to IPP patients.

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Conflict of Interest: Cliff Kline is an employee of Mentor, the manufacturer of the Alpha 1 IPP.

References
