Advanced Penile Length Restoration Techniques to Optimize Penile Prosthesis Placement Outcomes

Bhavik B. Shah, MD,[1] Marissa Kent, MD,[2] and Robert Valenzuela, MD[2]

ABSTRACT

Introduction: The most common cause of patient dissatisfaction after penile prosthesis placement is penile shortening compared with one's memory of a natural erection. Surgical techniques as well as preoperative and postoperative protocols have been reported to preserve and possibly enhance penile length in someone undergoing penile prosthesis surgery.

Objectives: This article presents a description of as well as the authors' experience with presurgical protocols, intraoperative techniques, and postsurgical protocols that allow for preservation or enhancement of penile length for patients who undergo inflatable penile prosthesis insertion.

Methods: An extensive, systematic literature review was performed using PubMed searching for key terms including penile lengthening, inflatablepenile prosthesis, penile girth, buried penis, and penile enhancement. All articles with subjective and/or objective penile length outcomes were reviewed.

Results: Several preoperative treatment protocols were found for penile length preservation and enhancement, which included use of a vacuum erection device as well as traction therapy. Intraoperative techniques included cavernosal sparing, channeling without dilatation, circumferential penile degloving, ventral phalloplasty, suprapubic lipectomy, liposuction, suspensory ligament release, sliding technique, modified sliding technique, multislice technique, and aggressive implant sizing. Postoperative protocols included early device inflation and cycling. Table 1 summarizes and compares the various preoperative, intraoperative, and postoperative strategies identified during literature review with their corresponding reported length gain.

Conclusions: Many preoperative, intraoperative, and postoperative surgical techniques can be performed by high-volume implanters to improve one's perceived or true penile length. In the hands of experienced, high-volume implanters, these techniques can be very meaningful for patients undergoing penile prosthesis insertion, particularly those who are concerned with penile length. **Shah B, Kent M, Valenzuela R. Advanced Penile Length Restoration Techniques to Optimize Penile Prosthesis Placement Outcomes. Sex Med Rev 2021;9:641–649.**

Key Words: Inflatable Penile Prosthesis; Malleable Penile Prosthesis; Penile Augmentation; Penile Lengthening; Penile Implant; Penile Prosthesis

INTRODUCTION

Penile length as well as an inability to perform sexually have long been, and still continue to be, a source of anxiety of men today.[1] The 2 most common causes of erectile dysfunction requiring placement of an inflatable penile prosthesis (IPP) include diabetes mellitus and prior prostate cancer treatment.[2–5] Both are associated with considerable penile shortening. The perception of loss of penile length in diabetics can often be attributed to weight gain. As a result, the penile length may be partially hidden because of weight gain in the mons pubis. In extreme cases, the weight gain may result in a "buried" appearance to the penis.[6] Prostate cancer treatment such as robotic radical prostatectomy, radiation therapy, cryotherapy, and androgen deprivation can lead to loss of penile length owing to corporal fibrosis secondary to nerve damage and impaired blood flow.[3–5]

Patient counseling and education is crucial before penile prosthesis implantation. Overall patient dissatisfaction rates after penile prosthesis placement range between 0% and 28%. This

Received April 27, 2020. Accepted May 24, 2020.

[1]Advanced Urology, Snellville, GA, USA;

[2]Department of Urology, Mount Sinai Hospital, New York, NY, USA

https://doi.org/10.1016/j.sxmr.2020.05.007

dissatisfaction has been linked to perceived loss of penile length, reduced sensitivity, poor concealment of the prosthetic elements, or device malpositioning.[7] Perceived loss of length, as compared with patient's preoperative natural erection penile length, is the most common complaint.[8] Just as the incidence of poor concealment, device malposition, and decreased sensitivity can be reduced with improved surgical technique, various intraoperative techniques can be applied to preserve and at times restore or enhance penile length at the time of IPP surgery. This article presents a review of the literature and a description of the author's experience with presurgical and postsurgical protocols and intraoperative techniques reported in the literature that allow for preservation or enhancement of phallic length for patients who undergo placement of an IPP.

Preoperative Treatments

Several preoperative protocols have been shown to aid in postoperative penile length preservation. Preoperative judicious use of penile traction and vacuum erectile device (VED) have shown to have positive effect on post-IPP penile length. Sellers et al[8] introduced a protocol that involves preoperative use of a VED in efforts to limit penile length reduction after IPP surgery. The hope is this will restore lost corporal length and girth from disuse atrophy. In this protocol, patients were instructed to use a VED for 10 minutes at least once daily for up to 2 months before surgery. In addition, patients were instructed to inflate the device within 2 weeks of the surgery. The idea is to allow for pseudocapsule formation around the inflated cylinder rather than a deflated one. The authors reported an average cylinder length increase by more than 3.5 cm based on these practice patterns.

Levine and Rybak[9] looked at the use of traction therapy before penile prosthesis surgery as a method of length preservation. This protocol required patients to use a penile traction device daily for 2–4 hours a day for up to 4 months. His group reported 70% had postoperative measured erectile length gain, up to 1.5 cm, compared with baseline pretraction preoperative stretched penile length, and no patient had perceived length loss after surgery. Although this protocol was tedious, their high compliance rate suggests the importance of penile length to patients.

Intraoperative Maneuvers

Surgical techniques can be broken down into 3 categories: (i) techniques for IPP placement that maximize corporal length, (ii) advanced maneuvers that improve perceived penile lengthening, and (iii) advanced maneuvers that increase true penile length. The perceived penile length improvement typically involves manipulation of surrounding tissue to, effectively, release a "buried" penis, whereas an increase in true corporal length is performed using additional incisions within the corporal tunica itself. The advanced maneuvers are generally considered much more involved procedures and are therefore recommended only for patients with erectile dysfunction and a significant degree of functional impairment or emotional distress from their current penile length.[10]

Implant Placement Techniques that Maximize Corporal Length

Cavernosal Sparing and Channeling Without Dilatation

Cavernosal sparing during penile implant surgery has been reported primarily to preserve the sensation of spontaneous tumescence. ZaaZaa et al[11] reported a prospective randomized study that compared minimal dilation of the corpora with an 8Fr dilator vs serial dilation during prosthesis placement in the setting of malleable penile prosthesis placement. While their primary end point was improved spontaneous tumescence in the cavernosal-sparing group, their secondary endpoints also indicated improved corporal tissue surrounding the implant suggesting improved girth and improved postoperative stretched penile length in this group compared with the dilated group. Moncada et al[12] reported a similar study involving 100 patients but with IPP implantation rather than malleable devices. They reported an increase in penile length measurements and improvement in the mean International Index of Erectile Function scores at 3 and 6 months postoperatively in patients who underwent corporal preservation during their IPP surgery.

Subcoronal Incision With Circumferential Penile Degloving

Long-standing erectile dysfunction can lead to loss of penile elasticity and as a result, dartos fascia tethering onto the underlying tunica albuginea can occur.[13] It has been theorized that this dartos fascia may have inherent restrictive properties that limit lengthening of the tunica albuginea.[10] The subcoronal approach to penile prosthesis placement allows for complete penile degloving and release of this underlying dartos at the time of penile implant placement. This technique was first reported with the use of inflatable penile implants by Weinberg et al.[14] Their series of 200 patients showed a gain in penile length when compared with traditional infrapubic penile prosthesis placement. In addition, the subcoronal incision has been shown to facilitate multiple penile lengthening procedures by providing access to the entire length of the tunica albuginea. Figure 1 demonstrates how the subcoronal IPP provides excellent cosmetic appearance because the only incision is the circumferential circumcision scar that the patient likely previously had.

Techniques that Improve Perceived Penile Lengthening

Ventral Phalloplasty

Scrotalization of the penis because of a high insertion of the penoscrotal junction on the penile shaft is often a direct result of excessive removal of preputial foreskin during prior circumcision.[15] This may result in a "buried" appearance to the penis and may even contribute to functional impairment. Ventral phalloplasty has been well reported in the pediatric literature.[16] It is an effective technique in reducing this penoscrotal web and simultaneous use of this technique during IPP surgery may improve patient satisfaction after the surgery.[17]

Figure 1. Subcoronal degloving demonstrating excellent cosmetic outcome. Panel A shows immediately after surgery. Panel B shows 6 weeks postoperatively. Figure 1 is available in color online at www.smr.jsexmed.org.

The procedure can be performed by stretching the scrotum away from the penis along the median raphe and then performing a check mark incision, as illustrated in Figure 2, that involves a vertical incision parallel to the phallus about 1 cm from the phallic edge connected to a convex curve taken from the scrotal edge of the outstretched penoscrotal web.[16] A thick layer of dartos should be preserved to decrease incision breakdown. In addition, in our experience, a curved mayo scissor can be used to excise excess scrotal skin to avoid a "dog-ear" appearance on the scrotum. Miranda-Sousa et al[16] reported 84% improvement in appeared penile length with this procedure when performed with a penile prosthesis.

Suprapubic Lipectomy and Liposuction

Patients with an exaggerated suprapubic fat pad or excess pannus overlying the penis as a result of weight gain may benefit from removal of excess overlying skin as well as the fat underneath.

In patients with excessive fat primarily around the fat pad, often with a "double-belly" appearance when standing, may benefit from a suprapubic lipectomy. This can be performed in a staged fashion or simultaneous with IPP surgery.[18] In this technique, markings are made about 1 cm medial to the anterior superior iliac spine bilaterally and are connected by a horizontal line. A third marking is made about 1 cm above the base of the penis, and a second curvilinear line is used to connect all 3 markings. The incision is carried down to the underlying lower abdominal fascia with care taken to avoid injury to the underlying spermatic cord. After removal of the fat pad, the corporal bodies can be easily identified, and a penile implant can be placed using the infrapubic approach previously described by Dr Perito.[19] Preoperative, intraoperative, and postoperative outcomes can be seen in Figure 3.

Shah et al[20] reported passing of the contralateral cylinder tubing (v-neck technique) under the phallic window to reduce tubing crossover that is often seen with the infrapubic approach. In our experience, in patients with preconnected pumps, passing the entire contralateral cylinder, as shown in Figure 4, under the subphallic window (ventral transposition)

Figure 2. Ventral Phalloplasty checkmark marking illustrated. Figure 2 is available in color online at www.smr.jsexmed.org.

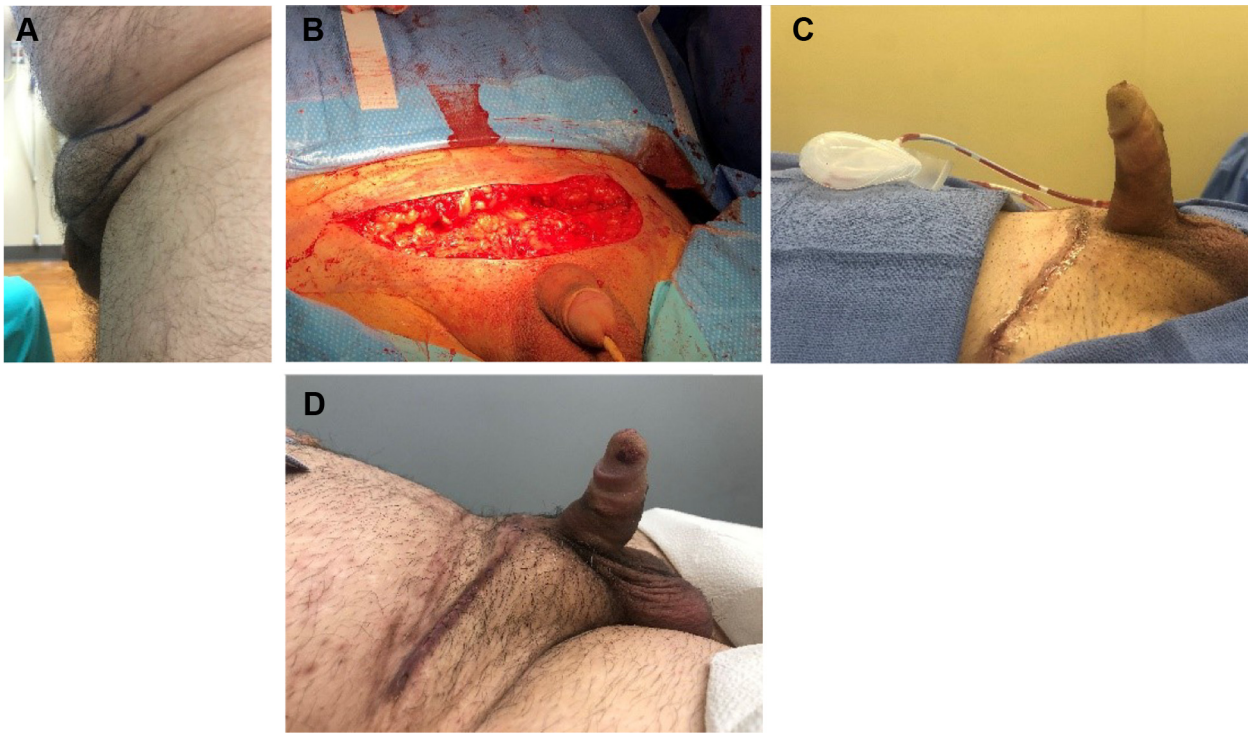

Figure 3. Suprapubic lipectomy. Panel A shows presurgical fat pad marking in a standing position. Panel B shows surgical wound after suprapubic fat pad excision. Panel C shows immediate postoperative closure with IPP placement. Panel D shows 6 weeks postoperatively. IPP = inflatable penile prosthesis. Figure 3 is available in color online at www.smr.jsexmed.org.

can be safely performed with minimal-to-no time added to the procedure.

2 large bore drains are placed, 1 along the abdominal wound and the other down the scrotal gutter, and the abdominal skin as well as the underlying campers and scarpas fascia are undermined enough to reapproximate the edges with minimal tension. The abdominal incision is closed in multiple layers by reapproximating the superior and inferior edges of the abdominal wound using Vicryl Suture, and the skin is realigned with staples or Monocryl Suture. The scrotal and abdominal drains are removed at 3 days and 2 weeks, respectively, and the patient is instructed to wear a body-shaping abdominal and scrotal compressive underwear that is used to shape the abdomen during the healing process. Baumgarten et al[18] stressed the importance of maintaining the drains as described, and although it was only a series of 8 patients, they reported their only infection was related to inadvertent removal of the drains immediately after surgery.

In patients with a large overlying pannus, panniculectomy with suction-assisted lipectomy (liposuction) can be used to remove the excess pannus that is obscuring the patient's genitalia.[17] This technique involves preoperative marking of the patient while standing to outline the area of resection, instillation of tumescent solution into the resection site fat, and subsequent suction lipectomy. Panniculectomy is then performed, excising excess skin and realigning the superior and inferior edges of the resection site in multiple layers. Owing to the complexity of this surgery, it is recommended that IPP surgery be performed in a staged fashion after complete recovery from panniculectomy.

Suspensory Ligament release

Suspensory ligament release is an adjunctive procedure to improve the appeared penile length that can easily be performed concomitantly with suprapubic lipectomy because of excellent visualization of the suspensory ligament with this approach.[18] It has also been reported with a V-Y skinplasty with simultaneous penile prosthesis placement. Owing to high risk of reattachment of the ligament and resultant decrease in phallic length, a silicone buffer is often placed as a spacer. Borges et al[21] reported a 93% satisfaction rate among 303 patients who had simultaneous IPP surgery with suspensory ligament takedown.

In our experience, release of the overlying fundiform ligament while preserving the true suspensory ligament can add penile length without the risk of reattachment and shortening of the penis. This can also be performed at the time of penile implant surgery through an infrapubic or subcoronal incision, which gives you adequate access to the ligament without the need for an additional incision.

Techniques that Improve True Penile Length

Sliding Technique, Modified Sliding Technique, and Multislice Technique

The double dorsal-ventral patch graft, dubbed the "sliding technique," was introduced by Rolle et al[22] as a method of penile lengthening in patients with severe penile shortening secondary to Peyronie's disease. The penis is degloved using a subcoronal approach, and the neurovascular bundle is raised, in a similar manner to when performing a plaque incision. The neurovascular

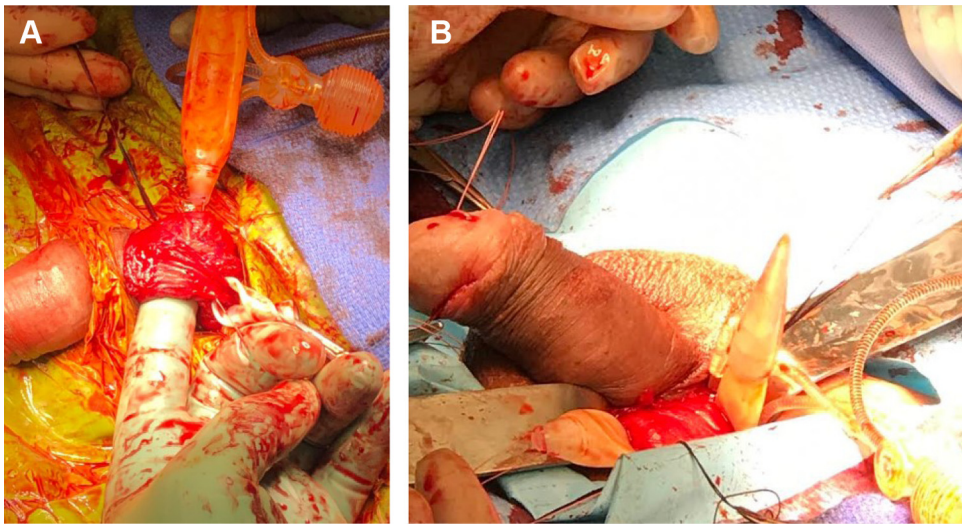

Figure 4. Ventral transposition during IPP placement with infrapubic incision. Panel A shows finger dissection through the subphallic window. Panel B shows passing of entire contralateral cylinder to eliminate tubing crossover. IPP = inflatable penile prosthesis. Figure 4 is available in color online at www.smr.jsexmed.org.

bundle, which runs along the dorsum of the penis, has unique undulations which allows the nerve to accommodate changes in length with erections.[23] By raising the neurovascular bundle off the corpora, it may be straightened to accommodate further length. However, a key to this technique is it must be elevated along the entire length of the penis to allow for maximal elongation.

The corpus spongiosum must also be separated from the corpora cavernosum in a similar manner. The corpus spongiosum, located on the ventral aspect of the penis, is invested by the tunica albuginea. Its tunica is much thinner than the corpora cavernosa and contains more elastic and smooth muscle fibers which allows for greater elasticity.[23] Mobilizing the corpus spongiosum off the corpora cavernosa at time of surgery allows for greater length accommodation.

Lateral longitudinal incisions are made on each side of the corporal bodies, 1 at 3 o'clock and the other at 9 o'clock. The length of these incisions is generally at least 4 cm and is based on the approximate stretching capacity of the neurovascular bundle and spongiosum. Next, dorsal and ventral semicircular incisions are made as illustrated and light traction is placed on the glans resulting in true lengthening of the corporal body. This is shown via computer illustrations in Figure 5. The tunica albuginea is secured with absorbable suture and dorsal and ventral patch grafts are then placed over the residual defects. An inflatable penile implant can then be placed using the subcoronal approach after dilating the corpora up to about 12Fr. In the original report of Rolle et al,[22] there was a reported stretched penile length gain between 2.5 and 4 cm. Rolle et al[22] later released a prospective study of 28 patients who underwent this procedure confirming similar gains in penile length with reports of 2 infections in patients with diabetes, 1 case of significant bleeding requiring blood transfusion in a patient on anticoagulation, and 1 report of permanent sensory loss.

The aforementioned approach was modified to avoid the need for grafting material, dubbed the "modified sliding technique" (MoST). In this version, Egydio and Kuehhas[24] showed that grafting was not necessary if simultaneous penile prosthesis is placed at the time of the sliding technique. Instead, the dorsal defects are covered by Bucks and the ventral defect is covered by compression of the corpus cavernosum and spongiosum. The mean length gain was 3.1 cm in a report by Egydio and Kuehhas[24] in 143 men.

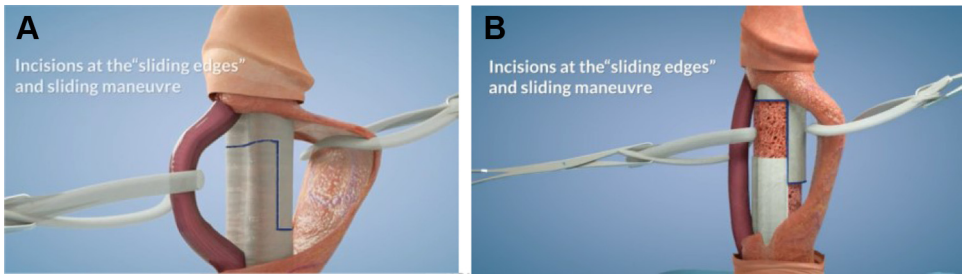

Figure 5. Sliding technique. Panel A shows computer illustration of corporal marking. Panel B shows computer illustration of elongation after incision is made. Figure 5 is available in color online at www.smr.jsexmed.org.

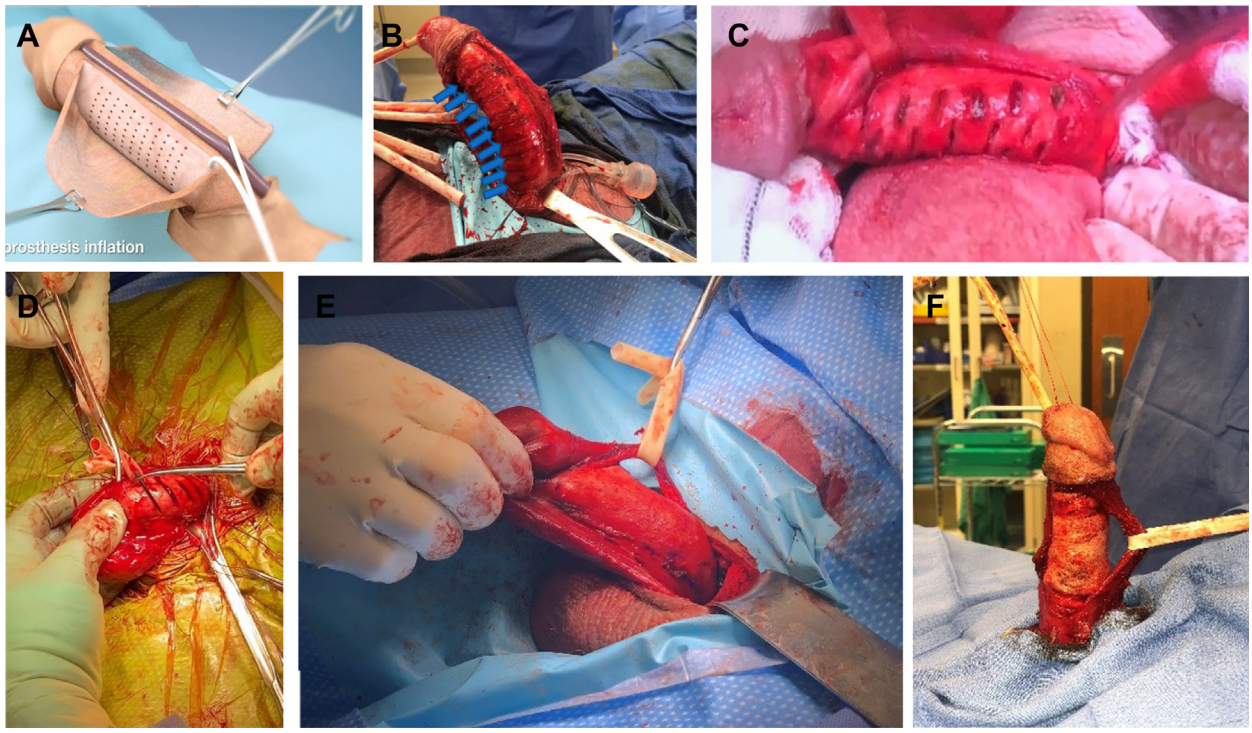

Figure 6. MuST. Panel A shows computer illustration of multislice technique. Panels B and C show multiple slices seen after elevation of the NVB. Panel D shows MuST using penis inversion technique via infrapubic incision. Panel E shows elevation of NVB using penis-inversion technique via penoscrotal incision. Panel F shows TachoSil placed around MuST defect after dorsal nerve elevation. MuST = multislice technique; NVB = neurovascular bundle. Figure 6 is available in color online at www.smr.jsexmed.org.

A variation to MoST is multislice technique (MuST), also introduced by Egydio and Kuehhas.[25] In his report, the urethra and neurovascular bundle are raised ventrally and dorsally as described in the sliding technique, and 2 longitudinal incisions are made in a similar manner. However, instead of just a single dorsal and single ventral horizontal incision, multiple dorsal and ventral hemicircumferential horizontal incisions are made along the penile shaft, as demonstrated in Figure 6, resulting in multiple sliding sections. He reported penile length gains of approximately 3.1 cm. Egydio and Kuehhas[25] reported on incidence of glans necrosis, likely related to urethral elevation. In our experience, when performing MuST purely for girth enhancement, lateral longitudinal incisions can be made without the need to elevate the neurovascular bundle or the urethra, theoretically reducing risk of nerve injury and glans necrosis. In addition, all 3 techniques, sliding technique, MoST, and MuST, can be performed not only with a subcoronal complete degloving approach as most commonly reported but also via the infrapubic and penoscrotal approaches by inverting the penis as demonstrated in Figure 6.

Any significant tunica albuginea defect that may be created at the time of girth enhancement or length restoration can easily be covered with collagen fleece (Figure 6) to prevent significant corpora efflux leading to hematoma formation.[26] TachoSil is a collagen patch coated with fibrinogen and thrombin that indicated to help control mild-to-moderate intraoperative bleeding. Animal studies have shown progressive degradation with remnants still remaining up to 12 months later. This delayed degradation allows time for natural closure of the underlying tunical defect.[27]

Postoperative Inflation Protocols

Most high-volume implanters would suggest aggressive prosthesis sizing with utilization of specified postoperative inflation protocols can help preserve and restore penile length. A multicentered study by Henry et al[28] in 2015 examined men who received aggressive cylinder sizing followed by a 6- to 12-month postoperative protocol that involved postoperative inflation of their prosthesis for at least 1–2 hours a day. Henry et al[28] reported an approximate 1 cm increase in length and girth at the 1-year follow-up.

Sellers et al[8] reported use of a VED before IPP placement followed by 50% inflation of his penile prosthesis for 48 hours and a reduction to about 25% inflation for 9–12 days. Patients are taught daily inflation around day 9–14 and are told to leave the implant inflated for about 1 hour before deflating it. This is continued for 3 months as pseudocapsule development is thought to be completed around that time. In this study, there was a reported 3.5 cm increase in cylinder length since institutionalizing this protocol.

Table 1. Comparison of penile elongation strategies and reported penile length gain

Technique	Average length gained	Description	Publication	N	Mo after surgery
Vacuum erection device	3.5 cm	10 min at least once daily for 2 mo before surgery	Sellers et al 2013[8]	750	N/A
Traction therapy	1.5 cm	Daily for 2–4 h for 2–4 mo before surgery	Levine and Rybak 2011[9]	10	N/A
Cavernosal sparing	(significantly longer, 10 vs 8 cm)	No cavernosal dilation at time of IPP insertion	Moncada et al 2010[12]	100	6 mo
Circumferential penile degloving	0.6 cm	Circumcision incision with penile degloving down to the penoscrotal junction	Weinberg et al 2016[14]	200	12 mo
Ventral phalloplasty	(84% of patients reported subjective increased length)	Release of the penoscrotal web at time of surgery	Miranda-Sousa et al 2007[16]	90	17 mo
Suprapubic lipectomy	(anecdotal patient satisfaction)	Suprapubic fat pad is excised at time of IPP	Baumgarten et al 2019[18]	8	256 d
Panniculectomy with suction-assisted lipectomy	(anecdotal patient satisfaction)	Staged surgery with panniculectomy and suction lipectomy before IPP	Adham et al 2000[17]	11	
Suspensory ligament release	1.73 cm	Suspensory ligament released at time of IPP	Borges et al 2006[21]	18	
Sliding technique	3.2 cm	Neurovascular bundle and corpora spongiosum raised off corpora then lateral longitudinal, semicircular dorsal and ventral incisions are made in corpora and patch grafts are placed dorsally and ventrally	Rolle et al 2016[22]	28	37 mo
Modified sliding technique	3.1 cm	Same as sliding technique with no grafts	Egydio and Kuehhas 2015[24]	143	9.7 mo
Multislice technique	3.1 cm	Similar to sliding technique only with multiple dorsal and ventral incisions	Egydio and Kuehhas 2018[25]	138	15.2 mo
Postoperative inflation protocol	1 cm	Postoperative inflation daily for 6 mo then inflate for 1–2 h a day for 6–12 mo	Henry et al 2015[28]	40	1 y

IPP = inflatable penile prosthesis.

In our experience, we recommend aggressive prosthesis sizing followed by prolonged postoperative inflation (~50%) until the patient is ready to cycle his implant. We have found this to be well tolerated and can be safely performed, providing hemostasis, as well as allowing excellent size restoration, particularly after a simultaneous penile lengthening procedure.

DISCUSSION

Comorbidities associated with erectile dysfunction, including Peyronie's disease, history of prostate cancer treatment, or diabetes with underlying obesity are associated with loss of penile length. Thus, in this setting, penile implant surgery is as much a cosmetic procedure to improve anxiety associated with reduced penile length as it is a surgery to restore penile functionality. For men with adequate internal corporal length but concern about their "perceived" penile length, procedures such as suprapubic lipectomy, ventral phalloplasty, or suspensory ligament release can be carried out at the time of penile implant surgery. For patients with concern for shortening of their true corporal length, particularly in the setting of Peyronie's disease, plaque incision or excision with or without patch grafting, sliding technique,

MuST, and MoST may be more effective techniques for penile length restoration.

Most reports suggested preferential use of an inflatable penile prosthesis over a malleable penile prosthesis in reference to improved length and girth as well as an improved ability to mold the penis and improved patient satisfaction.[29]

The use of preoperative and postoperative protocols are not well studied; however, recent reports have suggested improved outcomes in length and girth. Table 1 summarizes and compares the various preoperative, intraoperative, and postoperative strategies identified during literature review with their corresponding reported length gain.

There are clear limitations to this review. This article reports the authors' experience with each surgical technique without statistical data supporting clinical outcomes and complications. The feasibility and safety of these approaches in all settings cannot be deduced from this article. Rather, the purpose of this article is to provide details to approaches that may be available to allow for penile length restoration. In addition, despite various reports of stretched penile length listed in Table 1, the reasons for improvement in penile length is purely speculative.

Finally, it is important to note that most reports of these strategies have only been studied in the hands of high-volume implanters, and it is unclear if length outcomes would be different in the hands of lower-volume surgeons. Owing to their complexity, we recommend these techniques should be reserved for implanters with extensive experience.

CONCLUSION

Many preoperative, intraoperative, and postoperative surgical techniques can be performed by high-volume implanters to improve one's perceived or true penile length. In the hands of experienced, high-volume implanters, these techniques can be very meaningful for patients undergoing penile prosthesis insertion, particularly those who are concerned with penile length.

Corresponding Author: Robert Valenzuela, MD, Department of Urology, Mount Sinai Hospital, 625 Madison Ave, 2nd Floor, New York, NY 10022, USA. Tel: 212-781-9696; Fax: 212-568-7138; E-mail: Robert.valenzuela@gmail.com

Conflict of Interest: The authors report no conflicts of interest.

Funding: None.

STATEMENT OF AUTHORSHIP

Category 1

(a) **Conception and Design**
Bhavik Shah; Robert Valenzuela

(b) **Acquisition of Data**
Bhavik Shah; Robert Valenzuela; Marissa Kent

(c) **Analysis and Interpretation of Data**
Bhavik Shah; Robert Valenzuela; Marissa Kent

Category 2

(a) **Drafting the Article**
Bhavik Shah; Robert Valenzuela; Marissa Kent

(b) **Revising It for Intellectual Content**
Bhavik Shah; Robert Valenzuela; Marissa Kent

Category 3

(a) **Final Approval of the Completed Article**
Bhavik Shah; Robert Valenzuela; Marissa Kent

REFERENCES

1. Lever J, Frederick DA, Peplau LA. Does size matter? Men's and women's views on penis size across the lifespan. **Psychol Men Masc 2006;7:129-143.**
2. Akin Y, Sahiner IF, Usta MF. The impact of diabetes mellitus on penile length in men undergoing inflatable penile prosthesis implantation. **Turk J Urol 2013;39:161-164.**
3. Kim JH, Lee SW. Current status of penile rehabilitation after radical prostatectomy. **Korean J Urol 2015;56:99-108.**
4. Kadono Y, Machioka K, Nakashima K, et al. Changes in penile length after radical prostatectomy: investigation of the underlying anatomical mechanism. **BJU Int 2017;120:293-299.**
5. Frey A, Pederson C, Lindberg H, et al. Prevalence and predicting factors for commonly neglected sexual side effects to external-beam radiation therapy for prostate cancer. **J Sex Med 2017;14:558-565.**
6. Fuller TW, Theisen KM, Shah A, et al. Surgical management of adult acquired buried penis. **Curr Urol Rep 2018;19:22.**
7. Anaissie J, Yafi FA. A review of surgical strategies for penile prosthesis implantation in patients with peyronie's disease. **Transl Androl Urol 2016;5:342-350.**
8. Sellers T, Dineen M, Salem EA, et al. Vacuum preparation, optimization of cylinder length and postoperative daily inflation reduces complaints of shortened penile length following implantation of inflatable penile prosthesis. **Adv Sex Med 2013;3:14-18.**
9. Levine LA, Rybak J. Traction therapy for men with shortened penis prior to penile prosthesis implantation: a pilot study. **J Sex Med 2011;8:2112-2117.**
10. Gaffney CD, Pagano MJ, Weinberg AC, et al. Lengthening strategies for peyronie's disease. **Transl Androl Urol 2016;5:351-362.**
11. Zaazaa A, Mostafa T. Spontaneous penile tumescence by sparing cavernous tissue in the course of malleable penile prosthesis implantation. **J Sex Med 2019;16:474-478.**
12. Moncada I, Martinez-Salamanca JI, Jara J, et al. Inflatable penile prosthesis implantation without corporeal dilation: a cavernous tissue sparing technique. **J Urol 2010;183:1123-1126.**
13. Tran H, Goldfarb R, Ackerman A, et al. Penile lengthening, girth, and size preservation at the time of penile prosthesis insertion. **Sex Med Rev 2017;5:403-412.**

14. Weinberg AC, Pagano MJ, Deibert CM, et al. Sub-coronal inflatable penile prosthesis placement with modified no-touch technique: a step-by-step approach with outcomes. **J Sex Med 2016;13:270-276.**
15. Palmer LPJS. Management of abnormalities of the external genitalia in boys. In: Wein AJK, Louis R, Partin AW, et al., eds. Campbell-walsh urology. Philadelphia, PA: Elsevier; 2016. p. 3368-3398.
16. Miranda-Sousa A, Keating M, Moreira S, et al. Concomitant ventral phalloplasty during penile implant surgery: a novel procedure that optimizes patient satisfaction and their perception of phallic length after penile implant surgery. **J Sex Med 2007;4:1494-1499.**
17. Adham NM, Teimourian B, Mosca P. Buried penis release in adults with suction lipectomy and abdominoplasty. **Plast Reconstr Surg 2000;106:840-844.**
18. Baumgarten AS, Beilan JA, Shah BB, et al. Suprapubic fat pad excision with simultaneous placement of inflatable penile prosthesis. **J Sex Med 2019;16:333-337.**
19. Vollstedt A, Gross MS, Antonini G, et al. The infrapubic surgical approach for inflatable penile prosthesis placement. **Transl Androl Urol 2017;6:620-627.**
20. Shah BB, Baumgarten AS, Morgan K, et al. V-neck technique: a novel improvement to the infra-pubic placement of an inflatable penile implant. **J Sex Med 2017;14:870-875.**
21. Borges F, Hakim L, Kline C. Surgical technique to maintain penile length after insertion of an inflatable penile prosthesis via infrapubic approach. **J Sex Med 2006;3:550-553.**
22. Rolle L, Falcone M, Ceruti C, et al. A prospective multicentric international study on the surgical outcomes and patients' satisfaction rates of the 'sliding' technique for end-stage peyronie's disease with severe shortening of the penis and erectile dysfunction. **BJU Int 2016;117:814-820.**
23. Yang CC, Bradley WE. Neuroanatomy of the penile portion of the human dorsal nerve of the penis. **Br J Urol 1998;82:109-113.**
24. Egydio PH, Kuehhas FE. Penile lengthening and widening without grafting according to a modified 'sliding' technique. **BJU Int 2015;116:965-972.**
25. Egydio PH, Kuehhas FE. The multiple-slit technique (MUST) for penile length and girth restoration. **J Sex Med 2018;15:261-269.**
26. Hatzichristodoulou G. Evolution of the surgical sealing patch TachoSil in peyronie's disease reconstructive surgery: technique and contemporary literature review. **World J Urol 2020;38:315-321.**
27. Baxter. Tachosil fibrin sealant patch. Available at: https://advancedsurgery.baxter.com/tachosil. Accessed April 25, 2020.
28. Henry GD, Carrion R, Jennermann C, et al. Prospective evaluation of postoperative penile rehabilitation: penile length/girth maintenance 1 year following Coloplast Titan inflatable penile prosthesis. **J Sex Med 2015;12:1298-1304.**
29. Garaffa G, Minervini A, Christopher NA, et al. The management of residual curvature after penile prosthesis implantation in men with peyronie's disease. **BJU Int 2011;108:1152-1156.**