THE JOURNAL OF
SEXUAL MEDICINE

Penile Size Restoration With Nondegloving Approach for Peyronie's Disease: Initial Experience

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ABSTRACT

Introduction: The sliding technique (ST), commonly done with a subcoronal circumcising incision with penile degloving, has been used to restore penile size in patients with severe Peyronie's disease (PD) and erectile dysfunction, but with a potential risk of ischemic injury to the glans penis.

Aim: To provide detailed surgical techniques regarding the nondegloving ventral incision and report our initial experience with this approach to perform the ST and penile prosthesis placement in patients with severe PD.

Methods: This was a retrospective review of patient outcomes after penile prosthesis placement with penoplasty for severe PD and erectile dysfunction from January 2015 to December 2017.

Main Outcome Measures: Primary outcomes included straightening rates, penile measurement, along with immediate and late complications. Secondary outcomes include operative time and overall patient satisfaction.

Results: 12 Patients had significant penile atrophy and/or curvature >60 degrees and underwent inflatable penile prosthesis placement with grafting procedure. Significant penile atrophy was determined by a combination of the patient's subjective report and the surgeon's objective assessment through stretched penile length. 7 (58.3%) of those patients underwent ST, of which the last 5 had the procedure performed through a nondegloving ventral incision. Mean degree of curvature prior to ST was 66 degrees (45−90 degrees). Mean penile length gain was 2.6 cm (2.0−3.0 cm). At a mean follow-up of 15.5 months (3−31 months), only 1 patient had minimal residual curvature of 15 degrees. There were no vascular complications.

Clinical Implications: This nondegloving technique theoretically maintains blood flow continuity to the glans penis by preserving the continuity of the skin, dartos fascia, and neurovascular bundle.

Strengths & Limitations: Strengths of this study include the novel nature of this approach, no incidence of vascular complications, and adaptability to other grafting procedures during penile prosthesis placement. Limitations include the use of 5-item International Index of Erectile Function scores to assess preoperative erectile function on PD, small population, longer incision, and a possible steep learning curve.

Conclusion: While ischemic complications of ST and penile prosthesis implantation are rare, there are reports of ischemic injury in patients undergoing a subcoronal circumcising incision with penile degloving. The nondegloving technique with ventral incision provides for an alternative method for ST and penile prosthesis placement to maintain dartos and skin continuity to the glans penis while still allowing for adequate surgical exposure. **Clavell-Hernández J, Wang R. Penile Size Restoration With Nondegloving Approach for Peyronie's Disease: Initial Experience. J Sex Med 2018;XX:XXX−XXX.**

Published by Elsevier Inc. on behalf of the International Society for Sexual Medicine.

Key Words: Peyronie's Disease; Sliding Technique; Penile Prosthesis; Nondegloving

Peyronie's disease (PD) is a localized connective tissue disorder that results in penile curvature and deformity affecting up to 8.9% of male patients.[1] Although an exact etiology is unknown, it is believed that PD may be caused by microtrauma leading to chronic inflammation and formation of fibrous inelastic plaques within the tunica albuginea. PD is also known to cause penile shortening that can negatively affect the psychological well-being of male patients. Decreased penile length and girth, along with the inability to have successful sexual intercourse, has been

Received May 10, 2018. Accepted July 6, 2018.

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Published by Elsevier Inc. on behalf of the International Society for Sexual Medicine.
https://doi.org/10.1016/j.jsxm.2018.07.003

shown to lead to emotional challenges, dissatisfaction, and decreased quality of life in a large percentage of men.[2] Treatment options for PD are based on the severity of the penile deformity and degree of erectile dysfunction (ED). Up to 58% of PD patients have concomitant ED, making inflatable penile prosthesis (IPP) placement a common treatment option for these patients.[3]

Penile prosthesis implantation with traditional surgical interventions such as penile modeling, plication, and plaque incision or excision with grafting are well-accepted and widely used among the surgical community for patients experiencing PD with severe penile deformity and ED. However, many patients express dissatisfaction with surgical outcomes because of loss of penile length. To address this common concern, there are new reported surgical techniques that include the sliding technique (ST),[4] modified ST,[5] and the multiple-slice technique.[6] Since it was introduced in 2012, the ST has been utilized for patients with severe PD and medically refractory ED as it allows for simultaneous penile prosthesis placement and penile length restoration.[4] The original technique involves the use of a combined subcoronal circumcision incision and complete degloving of the penile shaft.[4,7] This approach allows adequate exposure of the surgical field, dissection of the neurovascular bundle (NVB) and urethra, and better access for plaque incision or excision with grafting.

Unfortunately, there have been reports of ischemic and lymphatic complications after subcoronal circumcision with penile degloving more commonly in patients with diabetes and peripheral vascular disease.[8–11] This provoked a paradigm shift in our practice. We previously described an innovative approach to these complex reconstructive surgeries through a ventral penile incision that could potentially reduce the risk of penile ischemia.[12] This surgical approach has matured and we aim to elaborate on our experience with the nondegloving approach to perform the ST, in combination with IPP placement.

INDICATIONS FOR PROCEDURE

The goal of the ST is to restore penile length, girth, and functionality of the penis in patients with penile atrophy and shortening caused by the fibrous plaque.[6,7] Given that this is not a commonly performed procedure and only limited centers in the world offer this surgery, there is no established algorithm for patient selection. We believe the ST with IPP is a procedure indicated for a very selective group of patients. The most important indications include severe atrophy of the penis due to PD and medically refractory ED. Medically refractory ED included patients failing phosphodiesterase-5 inhibitors and/or intracavernosal injection therapy. Patients may have curvature more or less than 60 degrees with or without indentations or hourglass deformity. Significant penile atrophy should be determined by the patient's subjective report and the surgeon's objective assessment. Stretched flaccid penile length from pubic bone to the tip of the glans penis is measured. The nondegloving approach may be applied to all patients undergoing the ST, modified ST, multiple-slice technique, and other complex surgical procedures for patients with PD, most importantly in those patients at risk for ischemic complications such as those with diabetes, smoking, and peripheral vascular disease.

PREOPERATIVE PREPARATION

Preoperative evaluation consisted of detailed history and physical examination with close attention to assess for palpable penile plaques and abdominal scars. The 5-item International Index of Erectile Function (IIEF-5) questionnaire was used to assess erectile function. Penile duplex Doppler ultrasonography with intracavernosal injection composed of (1 mg) phentolamine, (30 mg) papaverine, and (10 μg) prostaglandin E1 (Trimix, 0.10-mL dosage) was performed to assess plaque, penile hemodynamic response, and the severity of the deformity. Understandably, some patients will not have adequate erection during intracavernosal injection testing, thus limiting accurate assessment of severity of penile deformity. Therefore, patients with significant penile atrophy, any history of penile deformity, and insufficient erection during preoperative intracavernosal injection assessment were counseled preoperatively of all possible surgical reconstructive procedures including the ST.

Due to its complexity and potential risk for catastrophic complications, ST is currently performed in limited surgical centers by experienced reconstructive surgeons. We emphasize to every patient that the ST carries a higher risk of complications than other more standard procedures. The risk of glans ischemia, paresthesia, prolonged penile pain, and other possible complications are thoroughly explained to the patient. It is also extremely important to discuss realistic expectations and the limitations of penile size restoration with every patient.

The 3-piece IPP is considered the gold-standard penile prosthesis. There are currently 2 companies that manufacture such 3-piece penile implants in the United States: American Medical Systems (AMS) (Men's Health Division of Boston Scientific Inc, Minnetonka, MN, USA) and Coloplast (Minneapolis, MN, USA). Some studies suggest that Bioflex (Coloplast) used for Coloplast cylinders is more resilient and provides more rigidity than silicone materials used for AMS device.[13,14] Other studies have demonstrated that the silicone-coated cylinder with parylene for modern AMS devices provide comparable strength as Coloplast implants.[15] Therefore, patients are presented with both AMS and Coloplast devices as viable options for implantation.

INTRAOPERATIVE CONSIDERATIONS

Surgery is started by creating an artificial erection and marking the point of maximal curvature/deformity (Figure 1). A ventral incision is then made that extends from the frenulum to the penoscrotal junction. Using sharp and blunt dissection, dartos fascia is dissected at the penoscrotal junction in order to expose the urethra and bilateral corporal bodies. Corporotomy stay