CASE REPORT

A Case Report on a Fossa Navicularis Stricture Repaired using a Transurethral Ventral Buccal Mucosal Graft Inlay Urethroplasty Technique: A First in the Philippines

Clarice Condeno, MD; Oyayi Arellano, MD; Charles Gaston, MD;
Raul Carlo Andutan, MD and Mark Joseph Abalajon MD, FPUA

Department of Urology, East Avenue Medical Center

Objective: To describe the technique and report the first transurethral buccal mucosal graft ventral inlay (Nikolavsky Technique) urethroplasty done in the Philippines, in a patient who had a fossa navicularis stricture extending to the distal penile urethra.
Methods: Reported here is a case of a twenty-seven-year-old male who had a 40% distal urethral mucosal tear, as seen on initial cystoscopy, following traumatic catherization. The urethral tear was initially managed with a foley catheter maintained for a month. However, the patient eventually developed a 4 cm stricture extending from the fossa navicularis to the distal penile urethra. A ventral buccal mucosal graft was placed on the denuded urethral plate as an inlay patch via the transurethral route. No skin incisions nor penile degloving was done.
Results: Total operative time was four hours, including graft harvest time, with approximately 400 ml blood loss. The patient was sent home on the 3rd postoperative day. The urethral catheter was removed after 14 days. Post-operative follow-up was performed at 0-, 3- 6- and 12-months. A repeat voiding cystourethrogram was performed at 4 weeks showing no narrowing at the prior stricture site. On 12 months follow-up, uroflowmetry showed a Q-max of 20ml/sec with minimal residual urine. LUTS symptom scoring was at 7 and IIEF-5 score of 25
Conclusion: Repair of distal urethral strictures can be done using transurethral ventral buccal mucosa graft inlay urethroplasty. It can be challenging for longer strictures (>4 cm) but easily reproducible for shorter ones. The technique demonstrated good results on medium term follow-up. To the authors' knowledge, this is the first reported case that utilized this technique in the Philippines.

Key words: Buccal mucosal graft urethroplasty, Nikolavsky Technique, transurethral buccal graft inlay, distal urethral stricture, urethroplasty

Introduction

Urologic reconstruction of distal penile and fossa navicularis strictures (FNS) presents challenges due to the location of the strictures, a high likelihood of a multistage repair, and takes into account not only urethral patency but also glans cosmesis.[1-2] Most of the described methods for the management of distal urethral strictures require access to the distal urethra either through a longitudinal ventral or circumferential skin incision.[2-3] A one-stage transurethral ventral inlay buccal mucosal graft (BMG) approach, first described by Nikolavsky (2016), was developed to avoid the technical difficulties and complications associated with the more traditional techniques.[2] Report here is a successful repair of fossa navicularis stricture extending to the distal urethral using Nikolavsky's technique.

The Case

Reported here is a case of a 27 year-old male who had about 40% distal urethral mucosal tear, as seen on initial cystoscopy, following traumatic catheter insertion when he was admitted for medical reasons. The injury was initially managed with an indwelling catheter maintained for a month. At three months follow-up, the patient developed poor urinary stream which later progressed to retention. On combined retrograde urethrogram and voiding cystourethrogram (RUGM-VCUG), a 2 cm stricture was noted. Urethroscopy noted a 75% luminal obstruction, at the area of the fossa navicularis extending proximally to the penile urethra. Q-max was at 6 ml/min with more than 50% retention on post-void ultrasound studies. Given the location of the stricture, the decision to perform a transurethral ventral BMG inlay urethroplasty.

Surgical Technique

The risks and benefits of surgery were discussed with the patient, and an informed consent was obtained. Patient was positioned supine, pre-operative medications were given, and general endotracheal anesthesia was done. The lower abdomen, genitalia, and perineum were prepped and draped in the standard sterile manner.

A 4-0 vicryl traction suture was placed at the 12, 4 and 8 o'clock positions of the meatus (Figure 1A). Shallow transurethral urethrotomies were performed at the 3 and 9 o' clock positions using an ophthalmic scalpel. The incisions were then progressively deepened and extended proximally until normal tissue was encountered (Figure 1B). This was done under direct visualization distally from the meatus, and proximally with the use of a flexible scope passed antegradely from the suprapubic tract. A ventral wedge of the obstructing scar tissue was then excised between the 3 and 9 o'clock positions (Figure 1C). The aim here was to excise enough ventral tissue to allow the passage of a Fr24 foley catheter.

Antegrade flexible urethroscopy was performed to visualize the length of the defect and to confirm patency of the proximal urethra (Figure 1D). The defect was measured and an appropriate sized, tear-shaped buccal mucosal graft was harvested from the oral cavity. The buccal graft was defatted, fenestrated and prepared for its application.

Each arm of a double-arm 5-0 PDS suture was passed through the apex of the graft through the proximal apex of the urethrotomy, and then exteriorized through the skin (Figure 1E). The graft was parachuted into the urethra by pulling both arms of the suture externally (Figure 1F). The proximal apex of the graft was secured to the proximal apex of the urethrotomy by tying the external sutures. The distal edge of the graft was sutured using with 4-0 vicryl sutures to the edge of the meatotomy (Figure 1G). Quilting sutures were then placed transurethrally as well (Figure 1H). A 14-french foley catheter was placed and maintained for 14 days (Figure 1I). The patient was discharged on the 3rd postoperative day.

Results

Total operative time was 4 hours. Although there was little difficulty in performing the urethrotomies and excision of the scar tissue, the same could not be said for the placement of the most proximal anchoring sutures. The length of the defect made it difficult for the surgeons to reach the most proximal aspect of the denuded urethral plate and subsequent exteriorization of the suture arms. The patient was discharged on the 3rd postoperative day after an unremarkable stay in the wards. The indwelling urethral catheter was removed after two weeks and the patient was noted to void freely with no difficulty. A standard post-operative follow-up was performed at 0-, 3, 6-and 12-months. A repeat voiding cystourethrogram was performed showing no narrowing at the prior stricture site. Uroflowmetry at 12 months showed a Q-max of 20ml/sec with minimal residual urine. LUTS symptom score of 7 ,and an IIEF-5 score of 25 were documented on the 12th month (Table 1).

Discussion

Repair of distal urethral strictures and/or fossa navicularis pose a surgical challenge even to

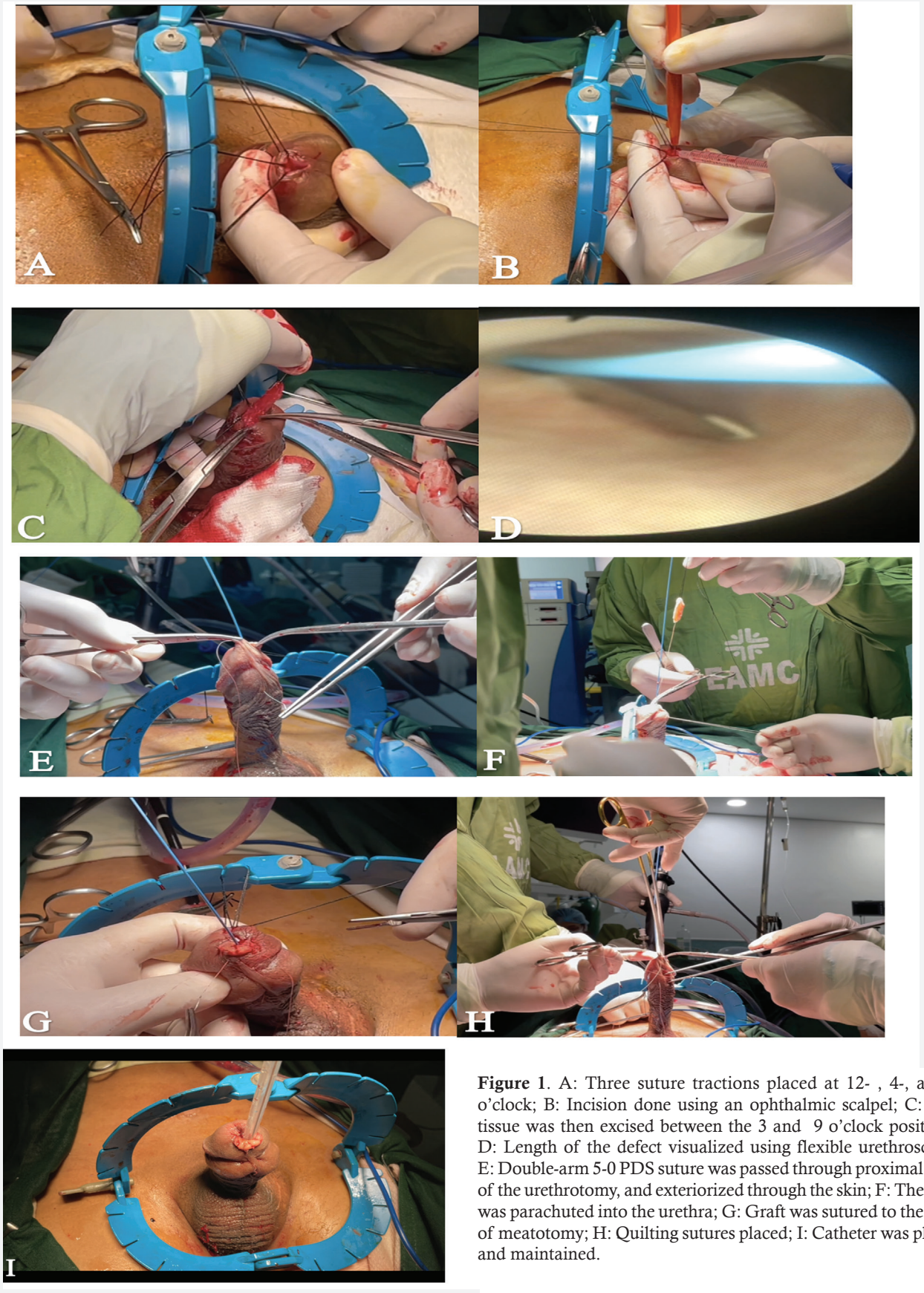

Figure 1. A: Three suture tractions placed at 12- , 4-, and 8 o'clock; B: Incision done using an ophthalmic scalpel; C: Scar tissue was then excised between the 3 and 9 o'clock positions; D: Length of the defect visualized using flexible urethroscopy; E: Double-arm 5-0 PDS suture was passed through proximal apex of the urethrotomy, and exteriorized through the skin; F: The graft was parachuted into the urethra; G: Graft was sutured to the edge of meatotomy; H: Quilting sutures placed; I: Catheter was placed and maintained.

Table 1. Post operative follow-up evalutation

Follow- up Period	Qmax	IPSS	IIEF
4 weeks	19 ml/sec	5	15
3 months	21 ml/sec	3	23
6 months	20 ml/ sec	7	25
12 months	20 ml/sec	7	25

experienced reconstructive urologists. Aneshvar, et. al. (2020)[3], discussed various options, as well as the evolution of surgical management of distal urethral stricture and fossa navicularis strictures. These surgical techniques included ventral meatotomy, meatoplasty, island flap ventral urethroplasty, and a double stage repair using BMG among others. Broadwin and Vanni (2018)[4] concluded that a single-stage repair is an appropriate choice for patients with isolated distal urethral strictures when compared to a double-staged repair since both techniques showed identical success rates, sexual function score, and patient satisfaction scores.

Locally, transurethral placement of buccal mucosal graft as an inlay patch to repair a urethral stricture is not new. Sasam and Abalajon (2021) performed a double-faced BMG repair for a female urethral stricture wherein both grafts were placed transurethrally as inlay patches.[6] In males, the transurethral ventral buccal mucosal graft inlay, a modification of Naude's endoscopic bulbar urethroplasty[5] for the treatment of distal urethral strictures, was first described by Nikolavsky[2] in 2016. This technique was comprised of a series of transurethral urethrotomies, excision of the scar and transurethral delivery and fixation of a BMG into the wound. The technique relied on the transurethral placement of sutures which allowed for both apical fixation and mid-graft "quilting" into the urethrotomy, performed under direct vision. This novel technique avoided glans dehiscence and other postoperative complications associated with the use of local island skin flaps and some of the older reconstructive techniques. The technique is not without its pitfalls. If longer ($\geq$ 4 cm) or more proximally located strictures are encountered, it would be more advisable to resort to a one-sided dorsal BMG onlay (Kulkarni Technique) as it would be very difficult to place proximal anchoring sutures in such cases. This scenario was encountered for this specific case as the surgeons had to pass a needle holder transurethrally, 5cm (4 cm wound defect plus a 1 cm margin) from the urethral meatus. Furthermore, parachuting a long graft into the urethral wound will be very difficult as the assistant surgeons have to make sure that the graft does not fold upon itself during its passage through the urethra. For shorter and more distally located strictures, the authors anticipate no such problems.

Conclusion

Repair of distal urethral strictures can be done using a transurethral ventral buccal mucosa graft inlay urethroplasty. It can be challenging for longer and more proximal strictures but is easily reproducible for shorter ones. The technique showed good results on medium term follow-up. To the authors' knowledge, this is the first reported case, for this technique in the Philippines.

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