Original Article

A single-stage dorsal inlay buccal mucosal graft placement through subcoronal vertical sagittal ventral urethrotomy without glansplasty for reconstruction of meatal stenosis, fossa navicularis, and distal penile urethral stricture: Our initial experience

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ABSTRACT

Introduction: Reconstruction of fossa navicularis stricture (FNS) poses a challenge in providing acceptable functional and cosmetic outcomes. We describe our novel surgical technique and its short-term results.

Methods: This urethroplasty technique is a single-stage dorsal inlay buccal mucosal graft placement with subcoronal vertical sagittal ventral urethrotomy without glansplasty. Twenty-one operated patients were followed up at 2 months and 6 months postoperatively. We studied the functional outcome of the International Prostate Symptom Score, quality of life (QoL) score, maximum flow rate, postvoid residual (PVR) urine, and reconstructed urethral luminal caliber. Sexual function was studied via a brief male sexual function inventory. Hypospadias objective score evaluation (HOSE) was used to assess the cosmesis. Patient satisfaction was evaluated using the global response assessment score (GRA).

Results: FNS is seen commonly associated with lichen sclerosus ($n = 12$). Nine patients had stricture that extended into the distal penile urethra. The mean stricture length was 2.76 cm. At the end of the study, a significant improvement in mean IPPS (18.81), mean QoL score (2.25), mean Q_{max} (20.94 mL/s), mean PVR (103.05 mL), and mean urethral caliber (16.06 Fr) were noted. No difference in sexual drive and erectile function but significant improvement in ejaculation was noted. All patients had single-stream urine, reconstructed urethral caliber ≥16Fr, HOSE ≥14, and GRA ≥2 at 6 months. Except for two patients, all had vertical slit-like meatus.

Conclusion: This technique is feasible, with good cosmetic, functional, and subjective outcomes with marked patient' satisfaction.

INTRODUCTION

The fossa navicularis is the glanular portion of the urethra just proximal to the external urethral meatus (EUM). The reported incidence of fossa navicularis stricture (FNS) is approximately 18% of all strictures.[1] Historically, untreated chronic urethral infections were suspected as the cause of FNS.[2] The other causes of this stricture may include trauma, urethral instrumentation, inflammatory conditions such as lichen sclerosus/balanitis xerotica obliterans (LS/BXO), and previous surgical repair for hypospadias.[2-4]

FNS caused by prior urethral instrumentation, such as transurethral resection of the prostate (TURP), have a different pathological process than FNS caused by LS/BXO. The reported incidence of urethral stenosis in post-TURP patients is about 8.6%.[5] Post-TURP urethral strictures can

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be caused by ischemia, trauma, or thermal injury during the procedure, secondary to prolonged surgical time and the use of a large resectoscope sheath (26 Fr).[5,6] High-power settings during resection can harm periurethral tissue and increase the risk of urethral injury.[5,7,8]

Correcting the FNS itself by repeated conservative management such as dilations, meatotomy, and internal urethrotomy may contribute to the occurrence of pan urethral stricture disease. Early reconstruction of such strictures may avoid these sequelae.[9] Repairing distal urethral strictures remains challenging, despite advancements in management techniques, due to difficulties in achieving good functional and cosmetic outcomes with low recurrence rates.

Here we introduce a novel single-stage technique of dorsal inlay buccal mucosal graft (BMG) placement through a sub-coronal vertical sagittal ventral urethrotomy for the reconstruction of meatal stenosis, FNS, and distal 1 cm penile urethral stricture. No glanuloplasty is required in this technique. We performed a thorough analysis of a new reconstruction technique based on our institutional expertise.

METHODS

Between June 2021 and January 2023, 21 patients of FNS, with or without meatal stenosis were enrolled. The patients with prior failed distal urethral reconstruction and stricture due to failed distal hypospadias repair were excluded. Six patients had unsuccessful meatal dilatation attempts, whereas two had unsuccessful meatotomy procedures. The individuals included in the study ranged in age from 15 to 65 years, with a mean age of 43 years. The patient's symptomology was assessed with an IPPS questionnaire and quality of life (QoL) score. All patients underwent uroflowmetry, retrograde urethrogram (RGU), and micturating cystourethrography (MCU), with postvoid residual (PVR) evaluated through ultrasonography. To study sexual function, we utilized the brief male sexual function inventory (BMSFI) questionnaire. For the patients who were not performing sexual activity, the BMSFI questionnaire was scored concerning their act of masturbation. Eight patients underwent suprapubic catheterization: two had pus discharge from the meatus, while the remaining six had urinary retention or hydroureteronephrosis.

Surgical technique

All patients underwent a standard preoperative consultation, and written consent was obtained. Preoperative intravenous antibiotics were given within 1h before the operative procedure. Under anesthesia, the patient was positioned in a dorsal lithotomy position. A 4.5/6.5 Fr ureteroscope was used to evaluate the length of the stricture, the distensibility of the involved urethra, and the condition of the urethral mucosa during urethroscopy. In some cases, the meatal stenosis required dilation before urethroscopy. The caliber of the stricture was measured with available different sizes of Foley catheter, U-cath, or guidewire. The rest of the procedures were done with patients placed in the supine position.

A guidewire was passed through the urethra and coiled into the bladder Figure 1c-o. Subcoronal incision is made on ventral penile skin. The skin incision is carried down through Dartos and Bucks fascia to the urethra and the edges retracted to expose the distal penile urethra with spongiosum. Short sub-coronal sagittal ventral urethrotomy incision (minimum of 1–1.5 cm) is made over a metallic urethral dilator or guidewire depending on the urethroscopic findings. Dorsal midline full-thickness urethrotomy incision is extended from about 1 cm proximal to stricture to the meatal opening. The dorsal incision in the glans is deepened so that postreconstruction neo-meatus acquires its normal location at the tip of the glans penis. Additional incisions are made dorsolateral or lateral in the urethral bed of the fossa navicularis to open the stricture segment. Dorsally or dorso-laterally, the spongiofibrotic scar is excised. At least a 24/28 Fr metallic urethral dilator is passed through the stricture segment before graft placement.

An appropriately sized (width of 1.5–2 cm) tongue-shaped buccal mucosa graft iss harvested [Figure 1j]. The buccal graft is defatted, fenestrated, and prepared for graft placement. The apical end of the buccal graft is tunneled through the meatal opening and iss stitched to the proximal end of the dorsal urethrotomy incision by a 4-0 vicryl suture. The BMG is inlayed over the raw area of the incised dorsal urethra. The graft is anchored to the edges of the incised dorsal urethra by 4-0 Vicryl sutures. The graft is quilted to the underlying tunica albuginea. The basal end of the graft is sutured to the margin of the meatus dorsally. In some cases, an additional fixation of the graft to the granular urethral bed is required. For this, a full-thickness 2'0 catgut suture is passed dorsally outside in the urethral lumen taking the glans and graft; with the needle taken inside out through the meatus and knot tied outside. Such fixation when performed, that suture is removed on the 2nd postoperative day. Thereafter, the urethra is retubularized by closing the incised ventral urethra using interrupted 4-0 vicryl suture over 16 Fr silicon Foley's catheter. The sub-coronal skin, Dartos, and Buck fascia is closed with 4-0 chromic catgut suture. Compression dressing is applied.

Postoperative period and follow-up

The dressing was removed on the second postoperative day. The patients were discharged with a urethral catheter. The catheter was removed at 2 weeks postoperatively. The follow-up visit was planned in the postoperative 2nd month and 6th month. That includes clinical examination, measurement of Q_{max} at uroflowmetry, PVR, and answering the IPPS questionnaire. At each visit, patients were asked

Figure 1: The radiological assessment of the fossa navicular stricture (FNS) and surgical technique of dorsal inlay buccal mucosal graft placement via subcoronal short ventral sagittal urethrotomy. (a and b) shows retrograde urethrogram (RGU) and micturating cystourethrogram of FNS. (c) Subcoronal incision is made on ventral penile skin. (d) Skin incision is carried down through Dartos and Bucks fascia to the urethra. (e) Short sagittal ventral urethrotomy incision is made over the metallic urethral dilator or guidewire. (f) Dorsal midline urethrotomy incision extending from 1 cm proximal healthy urethra to the meatal opening. (g) Shows an additional incision over the dorsal urethral bed toopenp the stricture segment. (h and i) shows the proper dorsal urethral bed preparation after spongiofibrotic scar excision such that a (28/32 Fr) metallic urethral dilator easily passes. (j) A tongue-shaped buccal graft is harvested. (k) The apex of the graft is tunneled through the meatal opening and stitched to the proximal end of the urethrotomy incision. The graft was inlayed and quilted over the underlying tunica albuginea by 4-0 vicryl sutures (l) The excess part at the base of the graft is tailored. The graft's basal end is sutured dorsally with the glans at the external urethral meatus (EUM). (m) The urethra is retubularized by closing the incised ventral urethra over a 16 Fr silicone Foley catheter. (n) Shows the condition of the glans on the 2nd postoperative day. (o) The vertical slit-like appearance of the EUM with healthy mucosa at the 2nd-month follow-up. (p) This follow-up RGU is of the patient who developed iatrogenic distal bulbar stricture following reconstructive surgery

about local site pain, angulation during erection, and splaying/splitting of the urinary stream. The patients were allowed to resume their sexual activity after their 2nd-month follow-up. Thereafter, sexual function was studied at a 6th-month follow-up.

Hypospadias objective score evaluation (HOSE) has been used for the evaluation of cosmetic results for both distal hypospadias surgery and distal penile urethral stricture reconstruction.[10,11] We used HOSE to assess cosmesis at the 6th-month follow-up. As a response to this procedure, the patient's perception of the change in his overall condition was evaluated with the self-administered global response assessment (GRA) scale. The GRA is a 7-point descriptive scale, scores of 1–3 indicate a worsening of symptoms, and 1–3 indicate an improvement in symptoms. A response of 0 represents no change in symptoms compared to baseline.

A successful outcome was defined as IPPS <10, GRA ≥1, Q_{max} ≥15 mL/s, and successful calibration with a 16 Fr Foley catheter and above without the need for further instrumentation or urethral dilatation during the follow-up period. A satisfactory cosmetic outcome is when the HOSE score is ≥14 in follow-up.

RESULTS

Patients' preoperative characteristics are summarized in Table 1. About one-fourth of the patients had a history of recurrent urinary tract infections/urethritis.

Table 1: Preoperative and intraoperative baseline characteristics of the study population

Population characteristics	Parameters, *n* (%)
Age (years), mean±SD (range)	42.71±14.367 (15–65)
Duration of LUTS (months), mean±SD (range)	33.19±31.033 (3–120)
Patients presented with	
Urinary retention	6 (28.6)
History of recurrent UTI	5 (23.8)
Poor urinary flow	10 (47.6)
IPSS score, mean±SD (range)	22.76±4.59 (17–32)
QoL score, mean±SD (range)	3.71±0.90 (3–5)
Etiology	
BXO/LS	12 (57.1)
History of urethral instrumentation	4 (19)
History of urethral catheterization	2 (9.5)
Circumcision	1 (4.8)
Unknown	2 (9.5)
History of meatal dilation	6 (28.6)
History of meatotomy	2 (9.5)
BMSFI Questionnaire, mean±SD (range)	
Sexual drive score	6.14±1.19 (4–8)
Functional erectile score	9.95±1.86 (3–12)
Ejaculation score	5.24±1.58 (2–7)
Problem assessment score	8.71±2.03 (4–11)
Overall satisfaction	2.05±0.86 (0–3)
Total score	32.1±6.46 (13–39)
Local examination findings	
Palpable bladder	6 (28.6)
Circumcised penis	1 (4.8)
Phimosis	4 (19)
BXO changes	12 (57.1)
Pus discharge at meatus	2 (9.5)
EUM appearance	
Adequate	1 (4.8)
Narrowed	8 (38.1)
Pinpoint	12 (57.1)
Epididymo-orchitis	1 (4.8)
DRE prostate size grade	
Grade I	16 (76.2)
Grade II	4 (19)
Grade III	1 (4.8)
Grade IV	0
USG KUB findings	
Bilateral HDUN (ONEN hydronephrosis grading system)	5 (23.8)
Grade I	2 (9.5)
Grade II	2 (9.5)
Grade III	1 (4.8)
Grade IV	0
PVR (mL), mean±SD (range)	128.5±88.79 (5–330)
Prostate (g), mean±SD (range)	27.85±11 (12–62)
Q_{max} (mL/s), mean±SD (range)	4.1±1.4 (1.7–6.5)
Preoperative SPC performed	8 (38.1)
Stricture segment caliber (Fr), mean±SD (range)	5.75±2.43 (2.67–10)
Length of stricture segment (cm), mean±SD (range)	2.76±1.06 (1–4.5)
Stricture location	
Meatal stenosis only	1 (4.8)
Meatal stenosis and fossa navicularis stricture	10 (47.6)
Fossa navicularis stricture without meatal involvement	1 (4.8)
Stricture extending into the distal 1 cm penile portion of the urethra	9 (42.9)

UTI=Urinary tract infection, LUTS=Lower urinary tract symptoms, IPSS=International prostate symptom score, QOL=Quality of life, BXO/LS=Balanitis xerotica obliterans/Lichen sclerosus, BMSFI=Brief male sexual function inventory, EUM=External urethral meatus, DRE=Digital rectal examination, PVR=Postvoid residual, SPC=Suprapubic catheterization, USG KUB=Ultrasound kidney, ureter, bladder, SD=Standard deviation

Inflammatory urethral stricture disease secondary to BXO was the main cause seen in more than 50% of the patients. Although histological confirmation has not been done, this etiology has only been established based on clinical examination. Iatrogenic strictures resulting from intraluminal urethral trauma due to post-TURP (n = 2), bladder neck incision (n = 1), cystoscopy for Double J stent removal postureteroscopic lithotripsy (n = 1), circumcision (n = 1), and catheterization (n = 2) accounted for 33.3% of the cases.

The mean stricture caliber was 5.75 Fr and the mean stricture length was 2.76 cm (1–4.5 cm). The preoperative mean IPPS score and QoL score were 22.76 ± 4.59 and 3.71 ± 0.90, respectively. The preoperative uroflowmetry showed maximum flow rates (Q_{max}) below 6.5 ml/s in all patients (mean 4.1 ± 1.4 mL/s) with a box-shaped flow curve. The mean PVR urine assessed by ultrasonography was 128.5 ± 88.79 mL. The mean baseline BMSFI score was 32.1 ± 6.46.

The 2nd-month follow-up assessment

Table 2 shows the evaluation at follow-up in the 2nd month. Two months after the urethral reconstruction, the decrease in mean International Prostate Symptom Score (IPSS) score, mean QoL score, and mean PVR concerning their baseline values were statistically significant. The mean IPSS score and QoL score were 7.48 ± 5.51 and 2.05 ± 0.92, respectively. Mean PVR was 27.10 ± 22.07 mL. Similarly, the increase in mean maximum flow rate and mean urethral caliber for their baseline value was significant. The mean Q_{max} was 24.4 ± 7.8 mL/s. The mean urethral caliber significantly increased to 23.05 ± 3.0 Fr. The urethral calibration with 16 Fr Foley was also successful in all patients except in one case who had developed iatrogenic short segment mid bulbar urethral stricture with Q_{max} 7.6 mL/s, PVR 106 mL, and box-shaped flow curve on uroflowmetry. RGU and urethroscopy suggested distal bulbar stricture [Figure 1p]. His reconstructed urethral segment caliber was 18 Fr, but the new stricture at the distal bulbar urethra had the caliber of 8 Fr. He underwent an optical internal urethrotomy and was followed further.

The 6th-month follow-up assessment

Table 2 shows the results of the 6-month follow-up. The mean IPSS score and QoL score further decreased with statistically significant differences compared to their values at baseline and the 2nd-month follow-up. The mean IPSS score and QoL score were 3.95 ± 2.9 and 1.19 ± 0.87, respectively. All patients had normal flow curves obtained on uroflowmetry. The mean maximum flow rate increased to 25.04 ± 5.3 mL/s. This increase was a statistically significant difference to the initial mean flow rate. However, statistical analysis did not reveal a significant difference when comparing mean maximum flow rate values recorded in the 6th month with those recorded in the 2nd month. Mean PVR additionally decreased from a 2-month follow-u *P* value, i.e., 27.09 mL to 25.9 mL, but this decrease did not have any statistically significant differences. The mean PVR significantly decreased when compared to the preoperative mean PVR. The mean urethral caliber value obtained at the 6-month follow-up had a decrease of 1.23 Fr compared to the mean urethral caliber value at the 2nd-month follow-up and was found to be statistically significant.

Table 3 shows sexual function outcome assessment at 6 months post-BMG urethroplasty. The differences in the mean score of both sexual drive and functional erection were not found to be statistically significant. An increase in mean ejaculation score of 2.14 above baseline was found to be statistically significant. Problem assessment and overall satisfaction were also found to be significantly improved from 8.71 to 10.43 and 2.05 to 2.48, respectively. Hence, the sexual function of the study population significantly improved with a mean increase of 4.57 in the total score.

HOSE score was ≥14 in each patient [Table 4]. All the patients had single-stream micturition. None of the patients had penile angulation at erection. Delayed complications (surgical site infection, graft necrosis, fistula, fossa navicularis re-stricture, or meatal restenosis) were not observed. GRA score was ≥2 in all cases and 81% (n = 17) of patients had a subjective feeling that their condition had markedly improved post-BMG urethral reconstruction. The remaining 19% of cases had a subjective feeling of moderate improvement in their condition.

DISCUSSION

The management of distal urethral strictures has evolved from dilatation and internal urethrotomy to definitive reconstruction techniques such as penile fasciocutaneous flap urethroplasty and buccal mucosa graft urethroplasty. Some of these procedures have short-lasting results or hypospadiac appearance of the meatus, or glans disfigurement. Although various options are available, the factors affecting the selection of treatment depend on the patient's age and general condition, etiology, characteristics of the stricture, prior failed procedures, the surgeon's operative familiarity, and preference and patients' expectations. No single technique applies to all distal urethral strictures.[5] We tried to study the feasibility and outcome of our technique of dorsal inlay BMG urethroplasty in FNS excluding prior

Table 2: Comparison of the subjective and objective variables studied for the outcome of the study at different time intervals

Variables	Mean values at baseline	Mean values at 2 months	The mean difference from baseline at 2 months (*P*)	Mean values at 6 months (*P*)	The mean difference from baseline at 6 months (*P*)	The mean difference between the value at 2 months and 6 months (*P*)
IPSS score	22.76	7.47	15.28 (<0.001)	3.95	18.81 (<0.001)	3.52 (<0.001)
QoL score	3.71	2.04	1.67 (<0.001)	1.19	2.52 (<0.001)	0.86 (<0.001)
Qmax (mL/s)	4.1	24.40	−20.29 (<0.001)	25.04	−20.94 (<0.001)	−0.64 (0.497)
PVR (mL)	128.95	27.09	101.86 (<0.001)	25.90	103.05 (<0.001)	1.19 (0.835)
Caliber (Fr)	5.75	23.05	−17.30 (<0.001)	21.81	−16.063 (<0.001)	1.23 (<0.001)

IPSS=International prostate symptom score, QOL=Quality of life, PVR=Postvoid residual

Table 3: Sexual function assessment through brief male sexual function inventory questionnaire at 6-month follow-up

Sexual function domains	Baseline mean value±SD	Mean value±SD at 6 months	Difference in mean score±SD	95% CI of the difference	*t*	Two-sided (*P*)
Sexual drive score	6.14±1.19	6.33±0.91	−0.19±0.60	Lower limit: −0.46 Upper limit: 0.83	−1.45	0.162
Functional erectile score	9.95±1.86	10.05±1.83	−0.095±0.54	Lower limit: −0.34 Upper limit: −0.15	−0.81	0.428
Ejaculation score	5.24±1.58	7.38±1.32	−2.14±1.28	Lower limit: −2.72 Upper limit: −1.58	−7.89	<0.001
Problem assessment score	8.71±2.03	10.43±1.75	−1.71±1.23	Lower limit: −2.27 Upper limit: −1.15	−6.38	<0.001
Overall satisfaction	2.05±0.86	2.48±0.81	−0.43±0.59	Lower limit: −0.70 Upper limit: −0.16	−3.29	0.004
Total score	32.10±6.46	36.67±6.05	−4.57±3.12	Lower limit: −5.99 Upper limit: −3.15	−6.71	<0.001

SD=Standard deviation, CI=Confidence interval

Table 4: Hypospadias objective score evaluation for cosmetic evaluation in our series at 6 months' follow-up

HOSE variable	HOSE score	Number of patients, *n* (%)
Meatal location		
Tip of glans	4	21 (100)
Proximal glans	3	0
Coronal	2	0
Shaft	1	0
Meatal shape		
Vertical slit	2	19 (84)
Circular	1	2 (16)
Urinary stream		
Single stream	2	21 (100)
Spray	1	0
Erection		
Straight	4	21 (100)
Mild angulation	3	0
Moderate angulation	2	0
Severe angulation	1	0
Fistula		
None	4	21 (100)
Single proximal	3	0
Single distal	2	0
Multiple	1	0

HOSE=Hypospadias objective score evaluation

failed distal urethral reconstruction and stricture due to failed distal hypospadias repair.

The radiographic evaluation with retrograde urethrogram (RGU) for glanular urethral strictures is difficult. Rather, MCU better interprets these distal urethral strictures and is the preferred imaging modality for FNS [Figure 1a and b]. We relied on clinical examination, MCU, and endoscopic evaluation of the urethra. On-table urethroscopy revealed that some BXO patients with FNS had mucosal involvement even beyond the stricture segment. One such BXO patient with meatal stenosis was included in the study as the fossa navicularis mucosa was involved without any narrowing.

Our surgical technique of single-stage dorsal inlay BMG placement through subcoronal vertical sagittal ventral urethrotomy is based on the principle described by Asopa *et al.* for anterior urethral stricture.[12] The graft's apex was fixed to the healthy urethra which was 1 cm proximal to the demarcation line created by diseased mucosa. This may be difficult if the graft is placed through a transurethral route. Hence, we performed subcoronal short ventral urethrotomy for dorsal inlay BMG placement and quilting it to the underlying tunica albuginea. Quilting decreases the dead space beneath the graft and increases the chance of graft uptake. Although no literature evidence is available, we believe that extending the graft placement to proximal healthy urethral mucosa may restrict the BXO progression beyond the grafting area. Performing only urethrotomy without grafting might not be enough because the mucosal edges, as it heals, produce scar and re-stricture. Thereafter, it requires frequent urethral dilation.

Surgical reconstruction for FNS harbors a distinct challenge for cosmesis to provide esthetically suitable glans. Patients are concerned about the outcome of glans appearance. In this technique, there is no need for glansplasty. Consequently, the glans appearance remains identical to their preoperative condition. Four patients who had phimosis required circumcision during the reconstruction procedure. The study on double-BMG graft urethroplasty for FNS reported circular meatus with splaying of urine.[13] All our patients except two eventually had a vertical slit-like meatal appearance. The two patients with resultant circular meatus had LS with severely scarred, puckered, and disfigured glans. Six patients reported to us that they experienced splaying of urine for 1–2 weeks after catheter removal. This improved spontaneously with the resolution of perioperative edema. Later, all patients had a single stream of urine during micturition.

The primary goal of any urethral reconstructive procedure is to create a patent functional urethra and alleviate patients' lower urinary tract symptoms (LUTSs). With each void, the reconstructed urethral conduit should deliver projectile, unobstructed, single-stream urinary flow. Results both at 2 months and 6 months follow-up showed marked improvement in symptoms, urethral caliber, maximum flow rate of urine, and reduction in PVR. When patients were individually studied, eight patients

still had LUTS with IPSS ≥ 10 at 2 months. Among these, five patients had predominant storage symptoms due to presumed detrusor overactivity which improved with uroselective antimuscarinic drugs. Two patients had benign prostatomegaly which improved on α-adrenergic blockers. Finally, one patient had an iatrogenic short-segment distal bulbar urethral stricture and underwent an optical internal urethrotomy. At 6 months, all the patients had symptomatic improvement with IPSS <10, Q_{max} >15 mL/s, normal flow pattern on uroflowmetry, and successful urethral calibration with 16 Fr Foley. Although we noticed a statistically significant decrease in mean urethral caliber (1.53 Fr) between the follow-ups, it had no clinical significance in terms of symptoms. On comparison of baseline BMFSI scores with that at 6 months, there were no significant changes in sexual drive and erectile function for the study population. Due to the relief of urethral luminal obstruction, significant improvement in both ejaculatory score and patients' overall satisfaction was noted (GRA score).

The small study population and short follow-up are the major limitations of the study. Replicating this procedure for FNS with completely obliterated meatus is expected to be difficult. Such cases might require a glans incision and glansplasty. Nonetheless, this technique is easy and feasible and reproduces good cosmetic, functional, and subjective outcomes with marked patient' satisfaction. At least 5 years follow-up is required to comment on the long-term results of this procedure. We would like to extend our study with the inclusion of redo cases and FNS due to failed distal hypospadias repair.

CONCLUSION

This dorsal inlay BMG urethroplasty technique without glansplasty can be a treatment option for FNS. It has shown promising results in alleviating symptoms and improving urine flow and ejaculation through the reconstructed urethra. It is an easy, feasible, and reproducible technique. Producing good cosmetic, functional, and subjective outcomes with marked patient' satisfaction.

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