



Open Access

LETTER TO THE EDITOR

Operational Andrology

Redo surgery for failed hypospadias treatment using a novel single-stage repair

Min Wu, Shu-Zhu Chen, Wei-Jing Ye, Yi-Dong Liu

Asian Journal of Andrology (2018) 20, 311–312; doi: 10.4103/aja.aja_22_17; published online: 4 July 2017

Dear Editor,

Urethral reconstruction of severe hypospadias represents one of the oldest problems and most common surgical challenges for pediatric surgeons. We recently developed a novel single-stage repair for these reoperative procedures. The aim of this letter is to describe our surgical procedure and report the first six cases treated with this technique. A total of six patients with prior failed repairs were referred to our center for reoperative hypospadias repair and underwent the novel single-stage procedure. The patient characteristics are presented in **Table 1**. Ethical approval was obtained from the Institutional Review Board of Renji Hospital, which was affiliated to the Shanghai Jiao Tong University, School of Medicine, Shanghai, China. Informed consent was obtained from patients or their parents.

A stay suture was placed through the glans for traction and sectioning scarring near the urethral plate, and an artificial erection was induced to confirm a straight incision. Penile scarring was reduced by sectioning the urethral plate as necessary, and the urethral plate was then fixed tensionless to the proximal portion of the penile body.

A defect between the distal glans and urethral plate on the ventral part of the penis remained. Due to previous repairs, the base near the urethra above the surface of the tunica albuginea was not well vascularized. Before rebuilding the urethral plate with a graft, the external spermatic fascia (ESF) was dissected from the inner layers up to the level of the external ring, thereby allowing the graft to reach the distal part of the glans. The graft was subsequently fixed to the base of the penis because the base exhibited a long pedicle and was well vascularized. The buccal mucosal graft was retrieved from the inferior lip and was transferred to the ESF to create the urethral foundation and rebuild the continuity of the urethral plate (**Figure 1**). A preputial island flap of local penile skin was created, transported to the ventral region, and anastomosed to the urethral plate made from the buccal mucosal graft. The remaining external spermatic fascia, pericardial adipose tissue, and pedicled ventral dartos flap were mobilized to cover the neourethra. A urethral silicone tube was maintained for 3 weeks, and no suprapubic cystostomy was left in place. Cystoscopy was performed approximately 4 weeks postoperatively.

The patients ranged in age from 3 to 22 years (median: 9.6 years, interquartile range: 8 years), and the follow-up time ranged from 6 to 26 months (median: 10 months, interquartile range: 12 months). In the six redo cases, the location of the meatus at the time of reoperative surgery was essentially unaltered in two cases due to severe chordee or rotation, whereas the remaining four cases required repair of long urethral defects secondary to total or partial urethral dehiscence. Complications of the procedure were identified in one patient who complained of obstructive voiding symptoms due to meatal stenosis and another patient who developed a urethrocutaneous fistula postoperatively (total complication rate: 33.3%). Meatal dilation was successful in the former case, and a simple urethrocutaneous fistula closure was performed in the reoperation case. Cystoscopy results of the six patients show that the grafts are in good survival and smooth.

The treatment of failed hypospadias repair remains one of the most challenging problems faced by urologists worldwide because the tissue of penis is often scarred and unsuited to further surgical procedures. Particularly in cases with poor-quality surrounding tissue in the reoperative field, the paucity of genital skin, significant scarring, and the lack of adequate facilities have led to the discouraging results reported by earlier researchers. Different surgical salvage approaches, including tubularized incised plate (TIP) urethroplasty, the Mathieu repair, onlay and tubularized island flaps, and free grafts, have been reported.^{1–4} If the urethral plate is present and sufficiently wide after prior failed hypospadias repair, urologists may opt for TIP urethroplasty. However,

Table 1: The clinical characteristics of all the patients

Variable	Patients (n)
Location of the urethral meatus	
Coronal	2
Mid-penis	1
Proximal penis	3
Number of previous repairs	
Two	2
Three	3
Unknown	1
Type of previous urethroplasty	
TIP	1
TPIF	3
Unknown	2
Degree of deviation	
Ventral curvature >30°	1
Right rotation ≈35°	1
None	4

TIP: tubularized incised plate; TPIF: transverse preputial island flap

Department of Urology, Renji Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai 200127, China.

Correspondence: Dr. YD Liu (1489217110@qq.com)

Received: 09 February 2017; Accepted: 23 May 2017

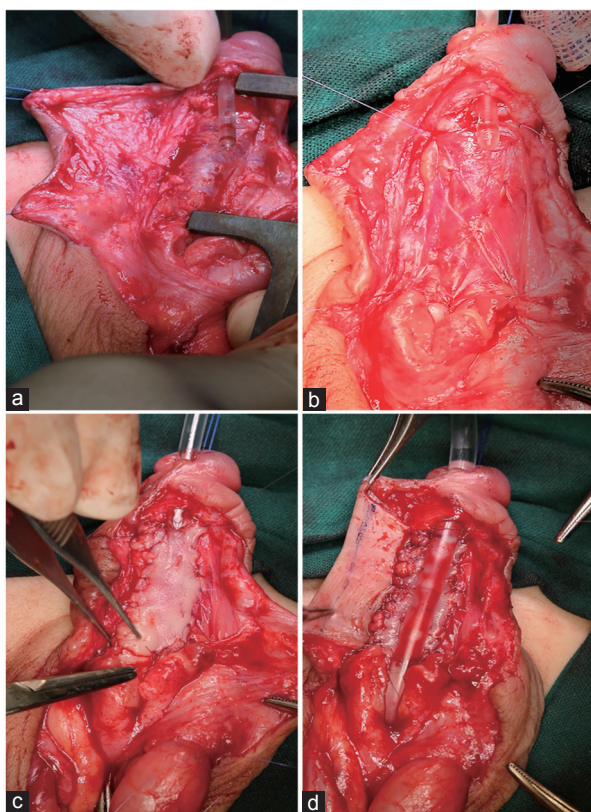


Figure 1: (a) Sectioned urethral plate is fixed tensionless to the proximal portion of the penile body and there is a defect between the distal glans region and the sectioned urethral plate in the ventral part of the penis. (b) The external spermatic fascia (ESF) is dissected off and transported to the bed of corpora cavernosa. (c) The buccal mucosal graft is transferred to the surface of the ESF to rebuild the continuity of the urethral plate. (d) Onlay anastomosis of adjacent penile skin flap is following to recreate a neourethra.

if the urethral plate is not suitable for TIP, especially if the urethral plate is absent or grossly scarred, thereby contributing to chordee and insufficient penile skin, a two-staged repair may be considered. Bracka⁵ reported a low complication rate in his cohort of primary repairs who underwent two-staged repairs, and Nitkunan's data also support the idea that the complication rate for secondary cases is similar to primary repairs with a two-stage approach.⁶ Even in patients with ten or more failed procedures ("hypospadias cripples"), Nitkunan *et al.*⁶ consider the two-stage repair to be the first choice approach.

Another broad category is single-stage buccal graft repair, given that the debate over a single-stage or two-stage repair for redo hypospadias surgery is ongoing. Macedo *et al.*⁷ introduced the concept of combining different and well-accepted principles of urethral repair in one operation for complex primary hypospadias cases, which consists

of using a buccal mucosal graft to substitute for the urethral plate and enabling an onlay transverse flap anastomosis covered by a second flap of tunica vaginalis. Considering the adjacent keloid scarring and urethral plate to be unsuitable for usage, we sectioned the urethral plate and removed all scarred and fibrotic tissue to expose the bed on the tunica albuginea, which was not well vascularized after prior failed repairs. The microvascularity of the ESF was suitable, and the wide ESF flap with a long pedicle could be easily mobilized to the distal penis without any risk for injury to spermatic vessels.⁸ We used the ESF to reinforce the vascularity of the tunica albuginea bed of corpora cavernosa before harvesting and quilting the buccal graft.

In summary, our novel combined technique is safe and effective. The approach uses a buccal mucosal graft placed over a pedicled external spermatic fascia with an overlaid adjacent penile skin flap, and this surgery appears to be a suitable technique for salvage urethroplasty in patients with prior failed hypospadias repairs.

AUTHOR CONTRIBUTIONS

MW carried out the studies, participated in the design of the study, performed the statistical analysis, and participated in the draft of the manuscript. SZC and WJY participated in study design and coordination and helped to draft the manuscript. YDL conceived of the study and provided the academic guidance. All authors read and approved the final manuscript.

COMPETING INTERESTS

All authors declare no competing interests.

REFERENCES

1. Barbagli G, Perovic S, Djinovic R, Sansalone S, Lazzeri M. Retrospective descriptive analysis of 1176 patients with failed hypospadias repair. *J Urol* 2010; 183: 207–11.
2. Snodgrass WT, Lorenzo A. Tubularized incised-plate urethroplasty for hypospadias reoperation. *BJU Int* 2002; 89: 98–100.
3. Borer JG, Bauer SB, Peters CA, Diamond DA, Atala A, *et al.* Tubularized incised plate urethroplasty: Expanded use in primary and repeat surgery for hypospadias. *J Urol* 2001; 165: 581–5.
4. Shanberg AM, Sanderson K, Duel B. Re-operative hypospadias repair using the Snodgrass incised plate urethroplasty. *BJU Int* 2001; 87: 544–7.
5. Bracka A. The role of two-stage repair in modern hypospadiology. *Indian J Urol* 2008; 24: 210–8.
6. Nitkunan T, Johal N, O'Malley K, Cuckow P. Secondary hypospadias repair in two stages. *J Pediatr Urol* 2006; 2: 559–63.
7. Macedo A Jr, Liguori R, Ottoni SL, Garrone G, Damazio E, *et al.* Long-term results with a one-stage complex primary hypospadias repair strategy (the three-in-one technique). *J Pediatr Urol* 2011; 7: 299–304.
8. Yamataka A, Ando K, Lane GJ, Miyano T. Pedicled external spermatic fascia flap for urethroplasty in hypospadias and closure of urethrocutaneous fistula. *J Pediatr Surg* 1998; 33: 1788–9.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

©The Author(s)(2017)