

Use Of Vascularized Prepuccial Flap In Tubularized Incised Plate Urethroplasty: A Study Of 50 Cases

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Citation

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Abstract

Purpose: To study the outcome of hypospadias cases operated using modified tubularized incised plate urethroplasty with vascularized prepuccial flap to reinforce urethroplasty.

Material and methods: Fifty Cases of hypospadias were included in this study, out of which 37 were distal penile, 10 coronal, 2 mid-penile and 1 proximal penile hypospadias patients followed for variable periods of time (range: 1 month to 13 months) postoperatively.

Results: The most common problem noted was thin stream, occurring in 15 out of 50 cases (30%) but responding very well to periodic dilatation. Seven out of 50 cases (14%) eventually developed fistula, all preceded by meatal stenosis, at the original site of the meatus. Three of these 7 cases responded to periodic dilatation and the fistula closed, 2 underwent simple closure and 2 were lost to follow up.

Conclusion: The most frequent and important complication to occur is meatal narrowing eventually leading to fistula formation. The cosmetic outcome of the cases was excellent, 8% developed fistulas that were easily manageable.

INTRODUCTION

Tubularization of an intact urethral plate for the repair of distal hypospadias was introduced by King in 1970 (1); in that technique the meatus was placed at the corona and did not reach the tip of the glans. Sadlowski et al. (2) extended tubularization of the urethral plate to the proximal part of the glans. Firlit (3) described tubularization of the intact urethral plate up to the tip of the glans, either alone or with a Duplay urethroplasty. Zaontz (4) reported good results with the same technique when the urethral plate is grooved and wide. Similarly, the megameatus intact-prepuce variant of hypospadias with a deeply grooved urethral plate is repaired via tubularization of the intact urethral plate (5). Von Horn and Kass (6) described the repair of coronal, anterior penile, mid-penile and penoscrotal hypospadias using in situ tubularization of the urethral plate. When a urethral plate is shallow, tubularization may be technically difficult; Rich et al. (7) introduced the concept of midline incision of the distal part of the urethral plate in conjunction with meatal-based flap or onlay island flap procedures to construct a vertically orientated and cosmetically normal neomeatus. Snodgrass (8) developed that concept and described a distal penile hypospadias repair using tubularization of an entirely incised

urethral plate at the midline to be widened and easily tubularized. Snodgrass et al. (9) reported satisfactory functional and cosmetic results in a large series (148 patients).

MATERIAL AND METHODS

Cases of various degrees of hypospadias were included in this study from our institute Maharaja Yeshwant Rao Hospital Indore over a period of 16 months between June 2006 and October 2007. They were clinically examined and a questionnaire was filled regarding the symptomatology of the cases.

The study was conducted with 50 cases, out of which 37 were distal penile hypospadias cases, 10 coronal hypospadias cases, 2 mid-penile hypospadias cases and 1 proximal penile hypospadias patient.

Various complications that occurred were noted and the time of their appearance was also noted, interventions done were recorded with their outcomes.

SURGICAL TECHNIQUE

A glans traction suture of 5/0 nylon is fixed; a circumferential incision is made 2mm proximal to the

hypospadiac orifice and the penis is degloved and a dorsal prepuccial flap is preserved. Two parallel longitudinal incisions are made to separate the lateral borders of the urethral plate from the rest of the glans. A circumcoronal incision is made on the inner prepuccial skin and another parallel incision is carried out on the outer prepuccial skin separating an island of prepuce from the rest of the skin; the lateral end of this incision meets the lateral end of the previously described parallel incision on the glans. The pedicle to this skin is dissected to the root of the penis so as to avoid torsion of the penis during the subsequent reinforcement of urethroplasty. Two glanular wings are dissected and reflected dorsally. A midline incision is made in the urethral plate extending from the tip of the glans to 1-2mm proximal to the hypospadiac meatus; if there is stenosis, the midline incision should be extended for 3-4mm proximal to the hypospadiac meatus to dilate it. The incision is deepened to widen the urethral plate, suitable for the selected size of the stent (6-12F) according to the diameter of the native urethra. Glanular tissue adjacent to the urethral plate is excised to facilitate glans closure without tension. The incised urethral plate is tubularized over a stent using interrupted and subcuticular 6/0 polyglactin sutures. The epithelium of the urethral plate should be inverted toward the lumen to avoid fistula formation. The inner prepuccial skin on the flap is discarded and external prepuccial skin with the vascularized pedicle is used to reinforce the urethroplasty with the external prepuccial skin layer facing externally. The glans wings are approximated using 6/0 polyglactin vertical mattress sutures; care is taken to exclude the neourethra from the glans sutures. The epithelial edge of the glans flaps should not be insinuated inside the glans wound. The glanular flaps are fixed to the neomeatus using a single suture of 6/0 polyglactin on each side. The stent is used as a urethral catheter and left in place for 7-12 days.

RESULTS

In our study data from a total of 50 patients was analysed, 37 of these were distal penile hypospadias cases, 10 were coronal hypospadias cases, 2 mid-penile and 1 proximal penile hypospadias.

The most common presenting complaints were abnormal location of the meatus followed by thin stream, abnormal direction of stream and curvature of penis.

Forty-seven of these 50 cases had a narrow meatus at presentation with thin urinary stream.

Other associated abnormalities were inguinal hernia in 2

(one on either side), leukoplakia on the glans in 1, bilateral retractile testis in 2, sinus tachycardia in 1 case, micropenis in 1 and congenital heart disease in 1 case and a case of left sided torticollis with hemifacial atrophy.

Of these 50 patients operated, 15 (30%) had complications in form of narrow stream. The peak time of appearance was the immediate period after decatheterization. Eight of these 15 cases responded well to periodic dilatation and were normal during the remaining period of follow-up.

The remaining 7 patients developed urethrocutaneous fistulas at the original site of the meatus, all following meatal stenosis; in these cases, 3 responded to periodic dilatation and the fistula healed over time. Two among the rest underwent simple closure of the fistula and 2 patients were lost to follow-up. A single case of skin bridge at the meatus occurred which was divided with no further complications. One case had blackening of skin over the repair on the ventral aspect of the penis in the immediate postoperative period.

DISCUSSION

Hypospadias with an incidence of 0.8-8.2 per 1000 live male births is a common clinical problem (₁). In the majority of cases, the abnormal meatus is situated in the glanular, coronal and subcoronal levels or in the distal part of the shaft. The goal of modern hypospadias surgery is a functionally and cosmetically normal penis. More than 200 methods have been introduced throughout the 125 years history of hypospadias repair. Many of the distal lesions were earlier repaired by meatal based flip flap procedure (the Mathieu procedure). Although this repair consistently produced a glanular meatus, the opening was often rounded, in contrast to the slit-like appearance of a normal meatus. Rich et al. introduced the principle of incising the urethral plate in the midline to improve the cosmesis of hypospadias repair in 1989 (₁₂). In 1994, Snodgrass advanced this concept by extending the incision of the urethral plate from the meatus to the tip of the glans (₁₀). This maneuver allowed construction of a new urethra from the existing urethral plate. It was suggested that healing may occur through re-epithelialization of the relaxing incision without obvious scarring, allowing the incised edges to remain separated (₁₃). Today TIP urethroplasty has become a preferred method for repairing distal hypospadias because of its versatility to correct different meatal variants, the simplicity of the operative technique, low complication rate and reliable creation of a normal appearing glanular meatus (₁₄). Since

most of the patients with midshaft and penoscrotal defects have a supple urethral plate, a midline incision consistently widens the plate and enables tubularization. This makes tubularized incised plate urethroplasty a versatile technique in repairing the proximal hypospadias as well. There are two contraindications to tubularized incised plate urethroplasty: severe chordee requiring plate excision for straightening the penis and an unhealthy urethral plate that appears thin or is insufficiently widened after incision. Complications are rare. Some have suggested that fistulas can be avoided by interposition of a vascularized dartos flap between the neourethra and overlying glans and shaft skin closures. Recently, Cheng et al. (15) have suggested a two layer closure of the neourethra to minimize the fistula rate. Closure of the first layer is done in a running subcuticular fashion with efforts made to invert the epithelium completely. The second layer incorporates the carefully preserved periurethral vascularized tissue. However, this study at our institute clearly shows that the most important complication is meatal stenosis that eventually leads to postoperative fistula formation. The use of an inner prepuccial flap to reinforce the repair has been associated with fistula rates as low as 8-14%. In our study, all of these fistulas occurred at the original site of the meatus.

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References

1. King LR. Hypospadias - a one-stage repair without skin graft based on a new principle: chordee is sometimes produced by the skin alone. *J Urol* 1970;103:660-3.
2. Sadlowski RW, Belman AB, King LR. Further experience with one-stage hypospadias repair. *J Urol* 1974;112:677-80.
3. Firlit CF. The mucosal collar in hypospadias surgery. *J Urol* 1987;137:80-3.
4. Zaontz MR. The GAP (glans approximation procedure) for glanular coronal hypospadias. *J Urol* 1989;141:359-61.
5. Duckett JW & Keating MA. Technical challenge of the megameatus intact prepuce hypospadias variant. *J Urol* 1989;141:1407-9.
6. Von Horn AC & Kass EL. Glanuloplasty and in situ tubularization of the urethral plate: simple reliable technique for the majority of boys with hypospadias. *J Urol* 1995;154:1505-7.
7. Rich MA, Keating MA, Snyder HM, Duckett JW. Hinging the urethral plate in hypospadias meatoplasty. *J Urol* 1989;142:1551-3.
8. Snodgrass W. Tubularized incised urethral plate urethroplasty for distal hypospadias. *J Urol* 1994;151:464-5.
9. Snodgrass W, Koyle M, Manzoni G, Hurwitz R, Caldamone A, Ehrlich R. Tubularized incised plate hypospadias repair: results of a multicenter experience. *J Urol* 1996;156:839-41.
10. Snodgrass WT. Tubularised incised urethral plate urethroplasty for distal hypospadias. *J Urol* 1994;151:464-5.
11. Sweet RA, Schrott HG, Kurland R, Culp OS. Study of the incidence of hypospadias in Rochester, Minnesota 1940-70, and a case control comparison of possible etiologic factors. *Mayo Clin Proc* 1974;49:52-8.
12. Rich MA, Keating MA, Snyder H, Mc C III, Duckett JW. Hinging the urethral plate in hypospadias meatoplasty. *J Urol* 1989;142:1551-3.
13. Bleustein CB, Esposito MP, Soslow RA, et al. Mechanism of healing following the Snodgrass repair. *J Urol* 2001;165:277-9.
14. Snodgrass WT, Lorenzo A. Tubularised incised plate urethroplasty for proximal hypospadias. *BJU Int* 2002;89:90-3.
15. Cheng EY, Vemulapalli SN, Kropp BP, et al. Snodgrass hypospadias repair with vascularised dartos flap: The perfect repair for virgin cases of hypospadias? *J Urol* 2002;168:1723-6.

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