

Standard Snodgrass technique in conjunction with double-layer covering of the neourethra with dorsal dartos flap is the therapy of first choice for hypospadias

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Abstract

Purpose To evaluate the validity of the standard tubularized incised plate (TIP) urethroplasty technique for different kinds of hypospadias.

Materials and methods From June 2002 to December 2003 and from March 2006 to October 2007 38 patients aged 1–22 years (average 7.34) were operated using the concept of TIP urethroplasty. The hypospadiac meatus were subcoronal in 28 patients (73.68%), midshaft in six (15.78%), and penoscrotal in four (10.52%). Standard TIP urethroplasty in conjunction with double-layer covering of the neourethra with dorsal dartos flap were used in the primary cases (28 patients). In the secondary cases (four patients) and in boys who were circumcised before admission (six patients), modified TIP urethroplasty was used. The mean periods of hospitalization and follow-up were 0.92 days and 4.19 months, respectively.

Results No fistulas were observed in boys who underwent primary reconstruction using standard TIP urethroplasty. Fistulas were observed in two patients (5.26%)—one patient with penoscrotal hypospadias who underwent two-stage repair and another who was circumcised before admission. One patient had meatal stenosis at the early postoperative period which was corrected by dilatation of the external meatus at intervals up to 2 months postoperatively.

Conclusion Standard TIP urethroplasty with double-layer covering of the neourethra with dorsal subcutaneous tissue is the procedure of choice for treatment of primary cases of distal/midshaft hypospadias. This technique seems suitable for reconstruction of proximal, secondary, and even complicated hypospadias.

Keywords Hypospadias · Urethra · Snodgrass technique

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Introduction

There are more than 200 named surgical procedures for correction of hypospadias with a few common general concepts to all. Tubularized incised plate (TIP) urethroplasty has gained widespread acceptance for repairing hypospadias and has become the therapy of first choice for many kinds of hypospadias [1–4]. In this study we report the experience of one

surgeon in the use of standard TIP urethroplasty in conjunction with double-layer covering of the neourethra with dorsal dartos flap as the therapy of first choice for various kinds of hypospadias.

Materials and methods

From June 2002 to December 2003 and from March 2006 to October 2007 38 patients aged 1–22 years (average 7.34) were operated using TIP urethroplasty. The hypospadiac meatus were subcoronal in 28 patients (73.68%), midshaft in six (15.78%) and penoscrotal in four (10.52%). The standard technique of TIP urethroplasty was used in all primary cases (28 patients). In boys who were circumcised before admission (six patients) and in the secondary cases (four patients) the new urethras were not covered with subcutaneous tissue. Data on patients are summarized in Table 1. The standard technique consisted of U-shaped incision, midline incision, and subcutaneous flap covering. The penis was degloved with a U-shaped incision extending along the edges of the urethral plate to healthy skin 2 mm proximal to the hypospadiac meatus. The urethral plate was widened by midline incision along its entire length. The urethral plate was then tubularized over a 6 or 8 F stent (6 F used in child patients and 8 F in patients in late childhood) using fine absorbable suture (5/0 polyglactin). The dorsal subcutaneous flap was harvested from preputial skin and dissected from the midline (Fig. 1); both layers of then flap were transposed to the ventral side of the penis with symmetric rotation. Each layer of the subcutaneous flap was sutured to the wings of the glans and corpora cavernosa, thus the neourethra was completely covered with a double layer of well-vascularized tissue. The glanular wings were approximated with no

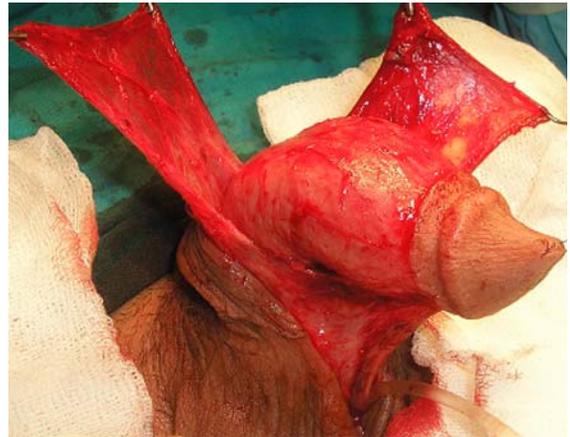


Fig. 1 Dorsal dartos flap prepared and dissected from the midline in 16-year-old patient with severe penoscrotal hypospadias and chordee

tension and closed with 5/0 polyglactin. Caution is needed during penile reconstruction to avoid damaging the blood supply of the dartos flap. To minimize the risk of meatal stenosis, the neomeatus was sutured in an oval configuration. Midline incision was not performed in the repair of secondary cases. Chordee release and hypospadias reconstruction were performed at the same time in a one-stage repair.

A moderate-tension dressing was used; it was changed 48 h postoperation. The mean hospitalization period was 0.92 days (range 0–3). The urethral feeding tube was removed one week postoperation. The mean follow-up period was 4.19 months (range 2–12).

Results

TIP urethroplasty resulted in a functional neourethra and a circumcised penis with good cosmetic appearance in all primary cases. Only two patients (5.26%) had urethrocutaneous fistulas—one patient who underwent secondary penoscrotal hypospadias repair and another who underwent subcoronal hypospadias repair and was circumcised before admission. One patient with primary hypospadias had meatal stenosis which disappeared after dilatation of the urethra by use of a 6 F feeding tube for a period of 2 months postoperation. Three boys had temporary narrow fistulas which leaked only a few drops of urine throughout urination and which were completely healed and closed within two months postoperation.

Table 1 Clinical characteristics of the patients

Meatus location	Primary cases (<i>n</i>)	Secondary cases (<i>n</i>)	Circumcised cases (<i>n</i>)	Total (<i>n</i>)
Subcoronal	20	3	5	28
Midshaft	5	0	1	6
Penoscrotal	3	1	0	4
Total (<i>n</i>)	28	4	6	38

n, number of patients

There were no symptomatic strictures in these patients. No patient had visible obstructive voiding symptoms on follow up.

Discussion

Tubularized incised plate urethroplasty was introduced as a method of choice for treatment of subcoronal hypospadias [2]. Later, however, Snodgrass et al. reported satisfactory functional results in patients when applying the same technique to repair mid penile and penoscrotal hypospadias [1]. The superiority of the TIP urethroplasty technique comes from the main key points of the procedure—midline incision by which the urethral plate is widened to create a tension-free neourethra, use of a subcutaneous flap to reinforce the neourethra and thus reduce the occurrence of fistulas [5, 6], and U-shaped incision by which closure of the first and the last layers is achieved.

We believe that the perfect repair of virgin hypospadias is standard TIP urethroplasty, because we had no fistulas in all primary non-circumcised cases. In one of the largest reported multi-institutional studies of experience with the Snodgrass technique, the optimal repair for routine hypospadias was this technique in conjunction with vascularized dartos flap coverage [7].

In secondary cases, midline incision and interposed flap were excluded, because the edges of the U-shaped incision were adequate to cover the neourethra without tension. From the re-operated cases only one patient (two years old) with penoscrotal hypospadias had a fistula. We believe that absence of dorsal dartos flap coverage and the highly fibrotic tissue around the urethra were the main reasons for the fistula in this patient (Fig. 2). Snodgrass et al. reported the validity of TIP urethroplasty in re-operated cases [4] and it was concluded that tubularized incised plate re-operation results in a functional neourethra with a vertical slit meatus when the plate has been preserved and appears supple after surgery, and that fistulas are less likely when a flap is interposed between the neourethra and skin [8]. When the plate is not open to an adequate width, an onlay island preputial flap can be used to supplement the urethral plate [9]. In rare cases when the plate is dysplastic and contributes to penile bending it is excised and a transverse island preputial flap is used to create a neourethra [10].



Fig. 2 Two-year-old patient after failure of repair of secondary penoscrotal hypospadias with highly fibrotic tissue at the ventral side

In the boys who were circumcised before admission only one patient (11 years old) with subcoronal hypospadias had a fistula. We expect that the age of the patient and the shortage of preputial skin (a subcutaneous flap could not be prepared) were the main reasons for the fistula in this case.

Urethral dilatation is important in patients who show leakage of urine from fistulas during the early period after removal of the urethral catheter. In our study three patients had very narrow fistulas which allowed leakage of few drops only, which is the reason we did not perform dilatation for these patients. Elbakry et al. [11] reported that urethral dilatation is important in preventing adhesion between the sides of the incised plate, which can result in meatal stenosis and fistulas. However other authors disagree, and believe that regular dilatation of the neourethra is unnecessary after TIP urethroplasty [12].

We agree with the argument of Snodgrass et al. that the decision is no longer determined by meatal location, as in the past, but by the severity of curvature and on the appearance of the urethral plate. Because severe curvature requiring plate transection or an “unhealthy” incised plate are uncommonly encountered, TIP repair can be performed in most hypospadias operations [6].

Conclusion

Tubularized incised plate urethroplasty can be performed for most kinds of hypospadias. Double-layer covering of the neourethra by subcutaneous tissue is a reasonable option for utilizing the dorsal dartos flap.

The advantages of TIP urethroplasty include its simplicity, low complication rates, and very good appearance of the glans with normal meatus.

References

1. Snodgrass W, Koyle M, Manzoni G et al (1998) Tubularized incised plate hypospadias repair for proximal hypospadias. *J Urol* 159:2129–2131
2. Snodgrass W (1994) Tubularized incised plate urethroplasty for distal hypospadias. *J Urol* 151:464–465
3. Snodgrass W, Koyle M, Manzoni G et al (1996) Tubularized incised plate for hypospadias repair: result of a multicenter experience. *J Urol* 156:839–841
4. Snodgrass WT, Lorenzo A (2002) Tubularized incised-plate urethroplasty for hypospadias reoperation. *Br J Urol Int* 89:98–100
5. Shanberg AM, Sanderson K, Duel B (2001) Re-operative hypospadias repair using Snodgrass incised plate urethroplasty. *Br J Urol Int* 87:544–547
6. Sozubir S, Snodgrass W (2003) A new algorithm for primary hypospadias repair based on TIP urethroplasty. *J Pediatr Surg* 38:1157–1161
7. Chenq EY, Vemulap EY, Kropp BP et al (2002) Snodgrass hypospadias repair with vascularized dartos flap: the perfect repair for virgin cases of hypospadias? *J Urol* 168:1723–1726
8. Nguyen MT, Snodgrass WT (2004) Tubularized incised plate hypospadias reoperation. *J Urol* 171:2404–2406
9. Hollowell JG, Keating MA, Snyder HM et al (1990) Preservation of the urethral plate in hypospadias repair: extended applications and further experience with the onlay island flap urethroplasty. *J Urol* 143:98–100
10. Duckett JW Jr (1980) Transverse preputial island flap technique for repair of severe hypospadias. *Urol Clin N Am* 7:423–430
11. Elbakry A (1999) Tubularized-incised urethral plate urethroplasty: is regular dilatation necessary for success? *Br J Urol Int* 84(6):683–688
12. Lorenzo AJ, Snodgrass WT (2002) Regular dilatation is unnecessary after tubularized incised-plate hypospadias repair. *Br J Urol Int* 89(1):94–97