

The THAI *Journal of* SURGERY

Official Publication of the Royal College of Surgeons of Thailand

Vol. 22

October - December 2001

No. 4

Tubularized Incised Plate, Snodgrass Hypospadias Repair : Surin Hospital Experience

Shusit Parnitvitidkun, MD

Department of Surgery, Surin Provincial Hospital, Surin, Thailand

Abstract

Purpose : We reported our experience in using tubularized incised plate urethroplasty for correction of hypospadias in Surin Provincial Hospital.

Materials and Methods : From September 2000 to June 2001, tubularized incised plate urethroplasty was performed in 8 boys. Their age ranged from 2 to 15 years. There were 2 cases of subcoronal, 3 cases of midshaft, and 3 cases of penoscrotal meatal hypospadias.

Results : Tubularized incised plate urethroplasty created a functional cosmetic outcome within 2 hours of operative time. Complication develops in one case (12.5 %) with wound dehiscence due to dislodgement of the stent on the second postoperative day.

Conclusion : Tubularized incised urethral plate urethroplasty is a versatile repair that can be applied to a wide range of variety in hypospadias. The procedure reliably creates a functional slit-like vertically oriented meatus following surgical correction.

Hypospadias with a prevalence of 30 to 39.7/10,000 male births is a common clinical problem.^{1,2} A multitude of different techniques for the repair exists, depending to meatal location for example : meatal advancement and glanuloplasty (MAGPI) or Mathieu procedure for proximal glanular or subcoronal meatus; transverse preputial island flap (Duckett) for midshaft or penoscrotal meatus.³ In our past experience in Surin Hospital, almost half of the cases had fistulas and cosmetic problems (Figure 1). In 1999 Warren T. Snodgrass described the tubularized incised plate

hypospadias repair for all types, distal, midshaft and penoscrotal defects. TIP urethroplasty reliably creates a vertical slit-like meatus. After surgery, most boys appear to have only been circumcised.⁴ We started our experience of this approach and technique on September 2000.

MATERIALS AND METHODS

Tubularized, incised plate urethroplasty was performed in 8 boys from September 2000 to June

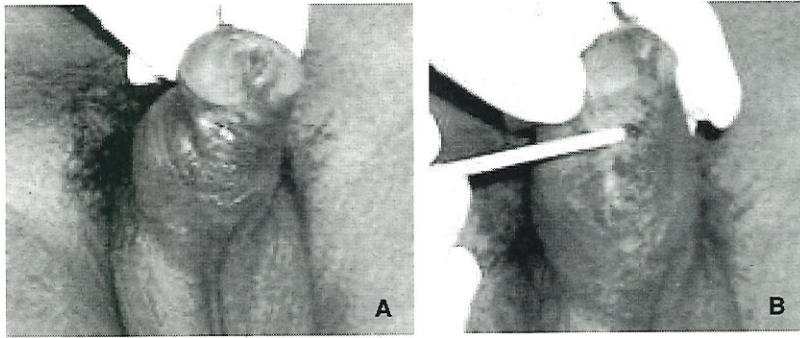


Fig. 1 The midshaft hypospadias case post transverse preputial island flap (Duckett). A, round meatus. B, fistula.

Table 1 Patients' age, meatal location and operating time.

Case No.	Age (year)	Meatal Location	Operating Time (hour)
1.	4 2/12	Midshaft	1.40
2.	2 3/12	Midshaft	1.20
3.	2 5/12	Subcoronal	1.40
4.	2 8/12	Subcoronal	1.20
5.*	1 9/12	Penoscrotal	1.50
6.	7 4/12	Penoscrotal	1.50
7.	3 10/12	Midshaft	1.40
8.	15	Penoscrotal	2.00
mean	4 11/12	-	1.40

2001. Patients' age ranged from 2 years to 15 years (mean 4 years). The preoperative meatal positions were subcoronal in 2 patients, midshaft in 3 and penoscrotal in 3 (Table 1).

Surgical Technique

An 8F tube is passed into the hypospadias meatus to assess skin coverage over the urethra. In distal hypospadias, a circumscribing incision is made 2 mm proximal to the meatus, but if necessary, a U-shaped incision is extended proximally to the healthy skin (Figure 2).

For proximal hypospadias, the lines of incision are immediately adjacent to the longer urethral plate (Figure 3). The penis is degloved to the penoscrotal junction. An artificial erection is induced to test for chordee. Mild persistent chordee is corrected by dorsal plication to preserve the urethral plate.

The glans is then infiltrated with 1:100,000 epinephrine along the lateral borders of the urethral plate. Parallel longitudinal incisions approximately 6

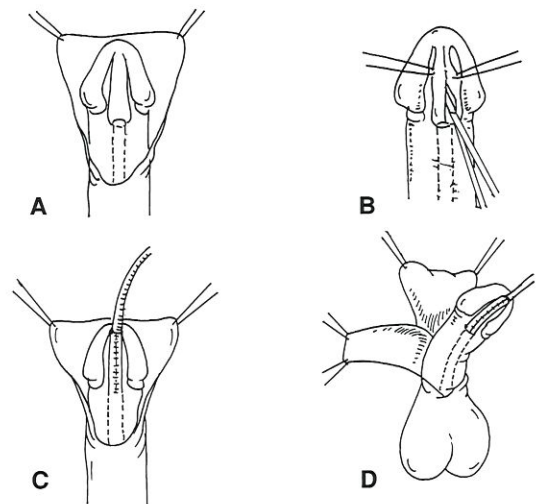


Fig. 2 Tubularized incised plate urethroplasty for distal hypospadias.

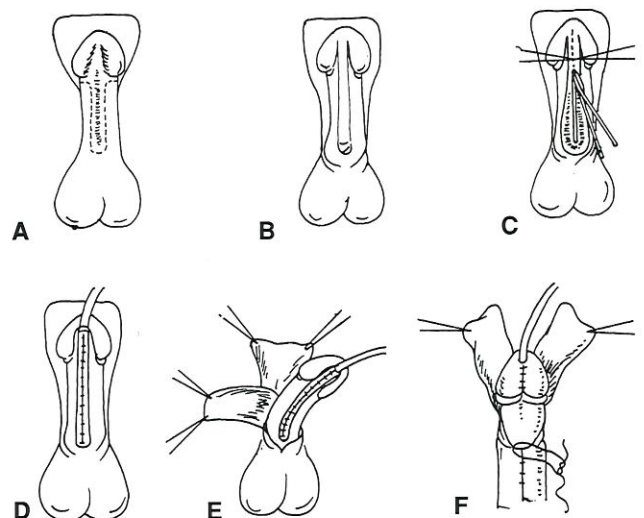


Fig. 3 Tubularized incised plate urethroplasty for proximal hypospadias.

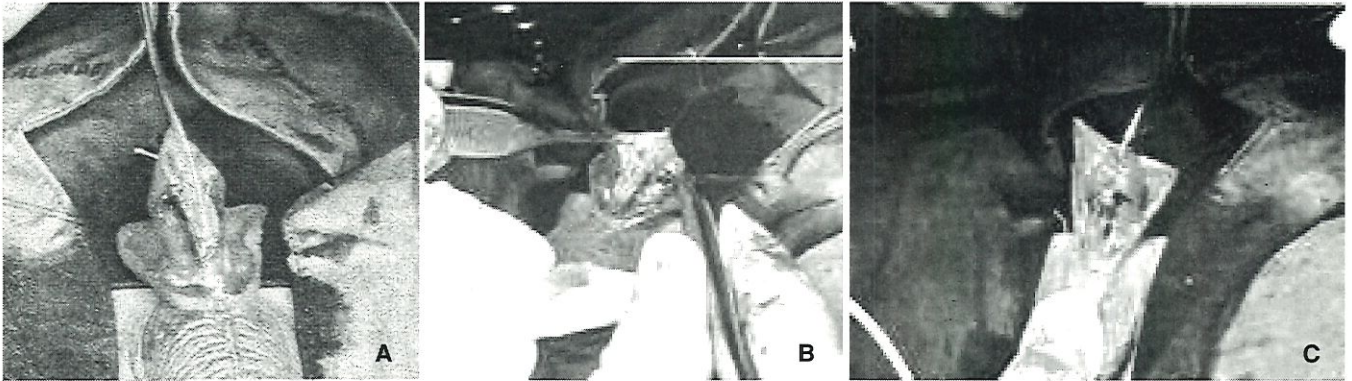


Fig. 4 Midshaft hypospadias. A, Urethral plate after penis is degloved. B, Markedly widened plate after midline incision. C, Urethral plate tubularized over stent.

to 8 mm apart define the urethral plate. The glandular wings are dissected laterally to facilitate subsequent glans closure.

The key step in the operation is a midline relaxing incision made from within the meatus to the distal extent of the plate (Figure 4). This incision extends through the epithelial surface of the plate deeply into underlying connective tissues and down to the corpora cavernosa.

If bleeding occurs, 1:1,000 epinephrine is dripped onto the wound and pressure is held for several minutes. These measures will usually be successful. It is probably best not to use electrocautery either to incise the plate or control bleeding so as to avoid injury to the tissues of the plate and the underlying corpora cavernosa.

Next, a 6F stent is passed into the bladder for postoperative urinary diversion. Then the urethral plate is tubularized. The first stitch is always placed at the midglans level and no more than one, or at most two, stitches are ever taken further distally to ensure the neomeatus to have a generous oval opening. Single layer of full-thickness 6-0 chromic catgut sutures are used.

The entire neourethra is covered by a thin dartos pedicle mobilized from the dorsal prepuce and shaft skin. Glansplasty follows, beginning at the corona and continuing distally with a total of three stitches. Skin closure is achieved by a variation of Byar's flaps with 4-0 chromic catgut. The stent drips into diapers for 7 to 10 days.

RESULTS

There was no chordee that needed correction in

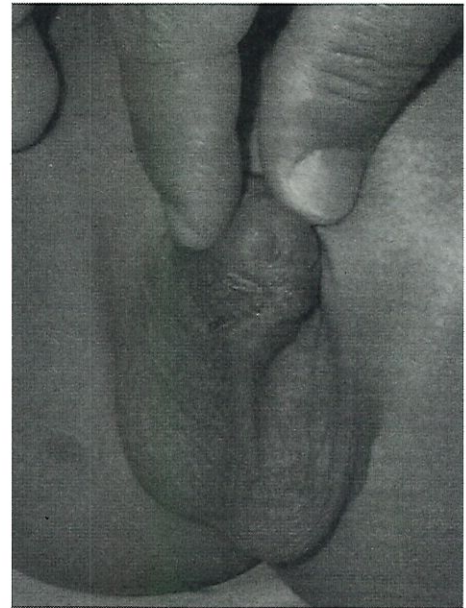


Fig. 5 Postoperative meatus with normal vertical, slit-like appearance

all cases. Operating time ranged from 80 minutes to 120 minutes, mean 100 minutes. The stents were left for 7 days. Complication occurred in one, the 5th case, in whom the stent was found dislodged on the 2nd postoperative day. The wound completely dehisced on the 6th postoperative day. Follow up at 1 month after discharge, all other cases appeared only as to have been circumcised (Figure 5).

DISCUSSION

Modern repair of hypospadias strives to create a penis that is not only functional but also cosmetically

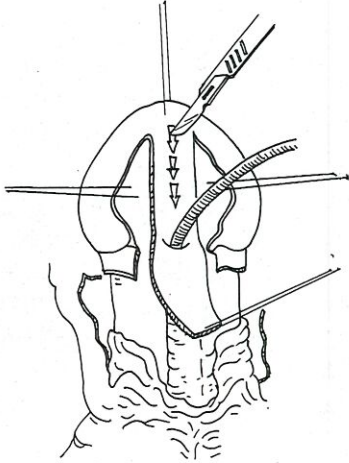


Fig. 6 Meatal - based (Mathieu) hypospadias repair with hinging the urethral plate meatoplasty

normal. In 1989 Rich et al⁵ described a technique of a cosmetically normal, vertical slit-like urethral meatus in conjunction with common hypospadias reconstruction that preserved the urethral plate (Figure 6). The distal portion of urethral plate is incised longitudinally in the midline. This incision allows the flat and rigid urethral plate to be folded or hinged during glansplasty, molding it into an anatomically correct vertical slit configuration. This modification has been applied successfully to a variety of meatal-based flap and on-lay island flap urethroplasties with no increased morbidity and significant improvement in meatal cosmetic result.

In 1994 Snodgrass described the incised plate urethroplasty modification for distal hypospadias repair.⁶ He modified the hypospadias repair by deeply incising the midline dorsal urethral plate from within the hypospadiac meatus to the distal extent of urethral plate. This maneuver allows construction of a new urethra from the existing urethral plate without additional skin flaps in a majority of cases. He reported a total of 16 boys who underwent the procedure with no case of meatal stenosis or fistula.

In 1998 he reported the same technique for proximal hypospadias⁷ in 27 boys. Complications of the primary repair developed in only 3 of 27 patients (11 %). On the following year, he also reported from multicenter studies⁴ that TIP urethroplasty can be utilized to repair most hypospadias even in reoperative cases. The complication rates were 7 per cent of boys undergoing distal hypospadias surgery and 11 per cent

of proximal hypospadias. The most common problem encountered in most series had been the development of fistulas.

Contraindications to TIP hypospadias repair are severe chordee that requires plate excision to straighten the penis, and unhealthy urethral plate that appears thin or is insufficiently widened after incision.

In a review of 328 tubularized incised plate urethroplasties, meatal stricture rate was 1.5 per cent with no evidence of neourethral stricture. Healing of the incision in dorsal urethral plate during tubularized incised plate urethroplasty occurred by re-epithelialization with normal tissue growth.⁸

Our experience in Surin Hospital shows that Snodgrass urethroplasties are applicable to all cases of hypospadias. The operation is completed within 2 hours with easy postoperative care. A short hospitalization, about a week, has been achieved. Tubularized, incised plate urethroplasty is now our procedure of choice for distal and proximal hypospadias repair.

References

1. Dolk H. Rise in prevalence of hypospadias. *Lancet* 1998; 341: 770.
2. Paulozzi LJ, Erickson D, Jackson RJ. Hypospadias trends in two US surveillance systems. *Pediatrics*, 1997; 100: 5.
3. Duckett JW. Hypospadias, *Campbell's Urology*. 6th ed. 1992; 2: 1893-909.
4. Snodgrass WT. Tubularized incised plate hypospadias repair: indications, technique, and complications. *Urology* 1999; 54: 6.
5. Rich MA, Keating MA, Snyder H McC, et al. Hinging the urethral plate in hypospadias meatoplasty. *J Urol* 1989; 142: 1551-3.
6. Snodgrass W. Tubularized, incised plate urethroplasty for distal hypospadias. *J Urol* 1994; 151: 464.
7. Snodgrass W. Tubularized incised plate hypospadias repair for proximal hypospadias. *J Urol* 1998; 159: 2129-31.
8. Bleustein CB, Esposito MP, Soslow RA, et al. Mechanism of healing following the Snodgrass repair. *J Urol* 2001; 165: 277-9.