

## OUR EXPERIENCE WITH TUBULARIZED INCISED PLATE URETHROPLASTY FOR DISTAL AND MID-PENILE HYPOSPADIAS

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Hypospadias does not present an isolated genital anomaly but a complex urological, sexual, psychological and psychiatric, reproductive and aesthetic problem. Although there are over 200 operative techniques, this great surgical challenge presently does not have ideal operative solution. Nowadays, the use of urethral plate for urethroplasty, through various surgical techniques, presents a revolutionary concept in hypospadias surgery and it is being accepted by an ever-increasing number of hypospadiologists.

Tubularized incised plate urethroplasty (TIP) -Snodgrass procedure was performed on a total of 22 boys; 16 distal (72.7%), 5 mid-penile (22.7%) and 1 proximal hypospadias in period from 1.1.2000 to 30.08.2003, by the same surgical team. The average patient age was 4.5 years (6 mon. to 12 years). All reconstructions have been done as primary urethroplasty while one distal hypospadias had one previous, unsuccessful MAGPI procedure. Complication included small urethrocuteaneous fistulas in 4 (18%) and meatal stenosis in 1 (4.5%) child. Snodgrass procedure is a successful method for reparation of distal hypospadias for it provides an excellent aesthetic result with acceptable complications. In order to evaluate the success of this method in reparation of mid- and proximal hypospadias, as well as the possibility of its application on previously unsuccessful or circumcised patients, it is necessary to gain additional experience although the first results are encouraging. *Acta Medica Medianae* 2003; 42(4):35-38.

*Key words: hypospadias, tubularized incised plate urethroplasty*

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### Introduction

Hypospadias is congenital abnormality of penis and urethra. Distal urethra is not developing normally so that urethral meatus lies somewhere along ventral surface of penis, from glans to perineum.

It is seen in 1:300 male infants. The incidence was almost doubled in the last 30 years.

The treatment is only surgical and there is no universal operative technique. The optimal age for definitive hypospadias management is 2 years in order to enable normal growth and development of falus and prevent psychological consequences affecting the patient and his family. The intervention is always planned as a single act, the following interventions are reserved only for correction of complications and resolution of previous surgical failures.

Apart from numerous surgical techniques for correction of hypospadias, a new technique has been recently described with purpose of improvement and perfecting aesthetic appearance. In 1994, Snodgrass described the technique of tubularized incised plate urethroplasty (TIP) forming vertical slit-like meatus (5,8). This technique was proposed as an alternative proce-

cedure for present standard techniques for distal hipospadias with minimal chordee- ("Flip-flap", Mathieu, onlay preputial flap) (5). Multi-center reports from 1996 by Sondgrass et al. (6) confirm that this method shows good results with a small percentage of complications for distal hypospadias and promote the application of this procedure for mid-penile and proximal hypospadias and as recently for re-operations, as well. Contraindication for this method is hipospadias with pronounced chordee.

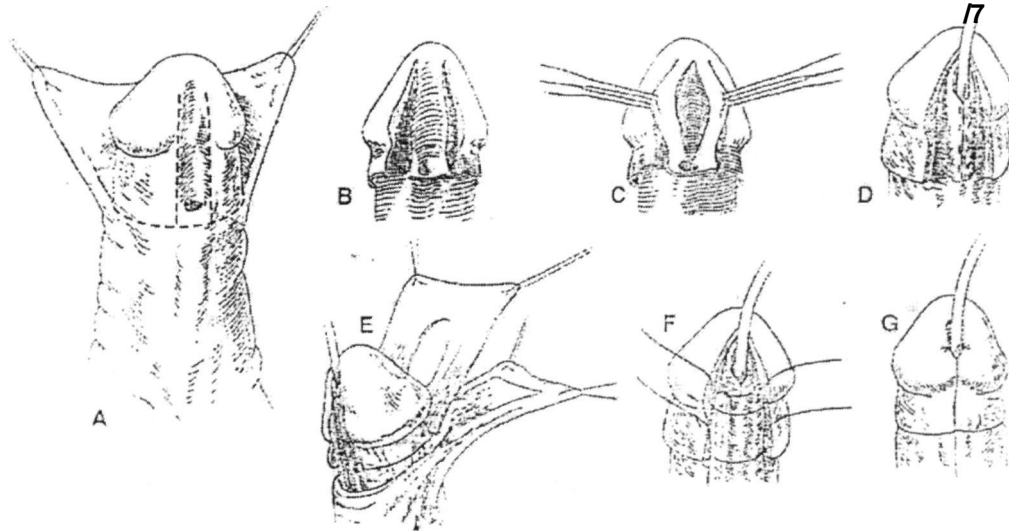
From this aspect, we would like to present our results with TIP urethroplasty for correction of distal and mid-penile hypospadias.

### Methods and material

From 1. 1. 2000 to 30. 8. 2003, 61 boys, average age 4.5 (6 mon-12 years) were hospitalized in Clinic of Pediatric Surgery and operated under hypospadias diagnosis. Snodgrass procedure was applied in 22 (36%) cases; 16 (72.7%) distal, 5 (22.7%) mid-penile and 1 (4.5%) proximal. All mid-penile hypospadias procedures were performed as primary urethroplasty while one distal hypospadias had one previous, unsuccessful glansplasty-MAGPI procedure.

We used a little modification for urinary drainage; instead of urethral catheter, we usually used- short, 4-6 cm, perforated intra-urethral stent, for postoperative urination, fixed on outer meatus and kept in place for 8-14 days. Short perforated urinary stent reduces hospital time.

Surgical technique: distal hypospadias repair:



- a) Horizontal line indicates circumscribing incision to deglove the penis. Vertical lines indicate incisions along the lateral margins of the urethral plate.
- b) Glans wings have been mobilized.
- c) Relaxing incision expands urethral plate.-

- a) Hypospadias distalis with fibrous chordee
- b) Hypospadias glanularis
- c) Excellent aesthetic postoperative result-Snodgrass procedure

ture, running subepithelial absorbable suture, with beginning at midglans level. Neomeatus is large and oval.

e) Dartos pedicle flap obtained from dorsal prepuce and shaft skin is button-holed and transposed ventrally to cover whole neourethra.

f) Glansplasty begins with approximation of glans wings at the corona. The mucosal collar is also closed in the mid-line with epithelial stitches.

g) Meatus is sewn to the glans at 5 and 7 o'clock. Closing of skin is completed by use of sub-epithelial stitches.



Figure a

**Results**

TIP urethroplasty- Snodgrass procedure was performed on a total of 22 boys; 16 distal (72.7%), 5 mid-penile (22.7%) and 1 (4.5%) proximal hypospadias in period from 1.1.2000 to 30.08.2003, by the same surgical team.

The average age was 4.5 (6m-12y) and average hospital stay was 5 (3-8) days. Meatus was stenotic in 10 (45.5%) cases; normal in 9 (40.0%); meagameatus in 3 (13.6%). We followed postoperative results average was achieved in all cases (even when urethrocutaneous fistulas existed), meatus is slit-like, vertically oriented and in normal position.

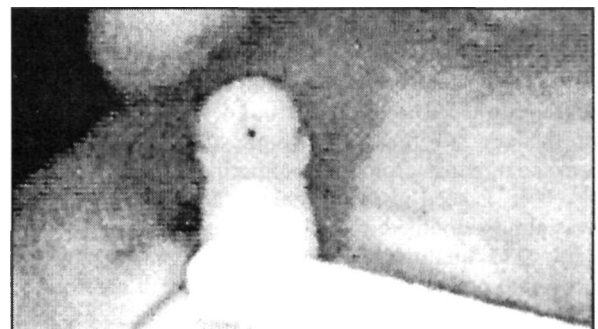


Figure b

Complications included small urethrocutaneous fistulas in 4 (18%) and meatal stenosis in 1 (4.5%) case. Urethral calibration showed that there were no strictures present in any of our patients. In 7 (30%) there was a fibrous chord present which was resolved by degloving maneuver. Dorsal plication was not needed. All complications had been successfully resolved, re-operated, after 6 months the earliest (fig. a, b, c).

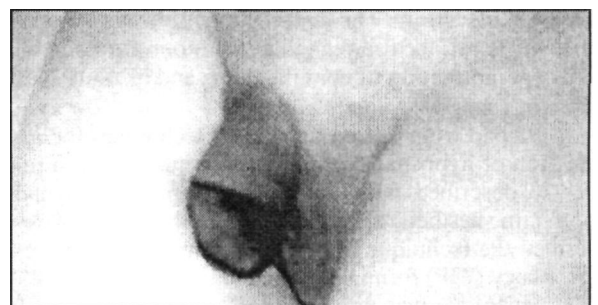


Figure c

## Discussion

Different techniques for correction of distal hypospadias have been described. Which technique should be used depends on meatal and glanular configuration (2,6). Meatal movement forward and glans-plasty is commonly used technique but its application depends on urethral mobility (3). If urethra is not mobile enough this technique may lead to glans deformation and elliptic meatus (2,3) In case of very thin or rigid paramental skin or a meatus too broad or proximal, MAGPI technique is not recommended (2). Paramentally based flap (Mathieu procedure) is a successful method for correction of more proximally distal hypospadias in absence of chordee but often results in transversally oriented meatus (3). Mathieu procedure is not desirable in cases where ventral skin is deficient (12). Simple urethral tubularization (Thiersch-Duplay) requires dissection of lateral edges of urethral plate for tubularization. Also, the increase of the width of urethral plate edges results in problems in glans closing (11,12)

The main step in TIP urethroplasty is deep-relaxing vertical incision of urethral plate which enables easy tubularization and vertically oriented meatus (5-12). The use of subcutaneous flap for neourethra covering reduces the percentage of fistulas (5,6,9). The

results of multi-centered research concerning the use of TIP urethroplasty for distal hypospadias give 7% complication percentage including meatal stenosis and fistulas in a series of 48 patients. In our series of 22 patients, the percentage of urethrocutaneous fistulas was 18%. Since this series was small, we believe that the future experience will give better results. Classical and modified Mathieu procedure shows low percentage of complications as well, Elder et al. 6%, Buson et al. 4.6% and Hakim 2.6%. These results are comparable to those of TIP urethroplasty but the latter has much better aesthetic appearance.

## Conclusion

Tubularized incised plate urethroplasty is a successful method for the repair of distal hypospadias. It provides good aesthetic appearance with minimal complications.

Short perforated urethral stent reduces hospital stay.

Further experience is necessary to evaluate the success of this method in repair of mid-penile and proximal hypospadias but the first results are encouraging.

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## URETROPLASTIKA TUBULARIZACIJOM I INCIZIJOM URETRALNE PLOČE. NOVA HIRURŠKA TEHNIKA ZA DISTALNE I SREDNJE HIPOSPADIJE

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Hipospadija ne predstavlja izlovanu genitalnu anomaliju već kompleksnu urološku, seksualnu, psihološko-psihijatrijsku, reproduktivnu i estetsku problematiku. Iako postoji preko 200 operativnih tehnika, taj veiki hirurgski izazov za sada nema idealnog operativnog rešenja. Danas, korišćenjem uretralne ploče za uretroplastiku kroz različite hirurške tehnike, predstavlja svakako revolucionarni koncept u hirurgiji hipospadija, koji prihvata sve veći broj hipospadiologa.

Uretroplastika tubularizacijom i longitudinalnom incizijom uretralne ploče (Snodgrass procedure) urađena je ukupno kod 22 dečaka; kod 16 (72,7%) distalnih, 5 (22,7%) središnjih i 1 (4,5%) proksimalne hipospadije u toku 2000-30.08.2003 g. od istog hirurškog tima. Prosečno godištebolesnikajebilo4,5 g. (6mes. -12g.). Sve rekonstrukcije su uradenc kao primarna uretroplastika dok je jedna distalna hipospadija imalaprethodnuneuspešnu Magpi proceduru. Komplikacije su uključivale male uretrocrotane fistule kod 4 (18%) i meatalnu stenozu kod 1 (4,5%) dece. Snodgrass procedura je uspešan metod za reparaciju distalnih hipospadija jer obezbeđuje odličan estetski rezultat sa prihvatljivim komplikacijama. Za procenu uspešnosti ove metode u reparaciji srednjih i proksimalnih hipospadija kao i mogućnost primene kod prethodno neuspešnih ili cirkumciziranih bolesnika neophodno je dodatno iskustvo, ali prvi rezultati su ohrabrujući. *Acta Medica Medianae 2003; 42(4):35-38.*

*Ključne reči: hipospadija, uretroplastika tubularizacijom i incizijom uretralne ploče*