

Comparative Study of Mathieu and Snodgrass Repair for Anterior Hypospadias

BY\DR. MEASAR. K. HADAIA

Lecturer urologist\college of medicine\hawler medical university

M.B.Ch.B-F.I.B.M.S-F.E.B.U-M.E.A.U

Abstract

Objective: to compare the outcome of Mathieu flap and Snodgrass repair in the treatment of anterior hypospadias.

Material and methods: Since November 2006 to April 2009 number of 50 patients suffering from anterior hypospadias (coronal, subcoronal, and distal shaft) underwent Mathieu flap repair (25 patients) and (25patients underrun Snodgrass repair.

All cases operated as a day case surgery, all the cases were stented for one weak, then followed up for one month and the complications compared between the two groups.

Results: Wound break down and urethral stricture was seen in 2 (8%) and 2 (8%) respectively in both groups while the incidence of urethro-cutaneous fistula is lower in Snodgrass group 1 (4%) than Mathieu flap group 2 (8%) and the incidence of meatal stenosis is higher in Snodgrass group- 2 (8%) than Mathieu-1(4%) as shown in table(1).stream abnormality was seen only in cases with meatal stenosis and improved with dilatation of the meatus and or meatotomy.

Cosmetic results were excellent with Snodgrass repair with a normal looking slit like meatus.

Conclusion: both methods of hypospadias repair are good and reliable with overall good result but the Snodgrass repair found to have better results regarding the overall success rate and better cosmetic appearance because it produce normal looking vertical slit urethral orifice while in Mathieu flap it looks transverse (fish mouth).

Key words: Anterior hypospadias, Mathieu flap, Snodgrass, tabularized incised plate, urethrocutaneous fistula.

Introduction:

Hypospadias is a congenital abnormality caused by incomplete development of the anterior urethra, in which the urethral meatus opened on the ventral side of the penis instead of the apex of the glans. its incidence rate is reported to be about 1 in 300 male live birth⁽¹⁾. Hypospadias is divided in to three types according to the site of orifice, posterior, middle, and anterior. In anterior type, the meatal orifice open either on the distal penile shaft, on corona, or under the glans⁽²⁾.

The most common type of hypospadias is anterior type (80%).

The aim of surgery in hypospadias is to achieve a functional penis with a normal cosmetic appearance. The commonest repairs to correct distal hypospadias are the Thiersch-duplay⁽³⁾, Mathieu mastarde⁽⁴⁾, meatal advancement, glanduloplasty(MGPI) and tabularized incised plate(TIP)^(5,6).

Of these procedures Mathieu and TIP have been widely practiced, Snodgrass is now the preferred method since it create a vertical slit-like normal appearing meatus unlike a horizontally oriented and rounded (fish mouth) produced by the meatal based flap(Mathieu).

TIP allows the construction of new- urethra from the existing urethral plate without additional skin flaps and this technique is suitable for all distal lesions.

Both methods make use of the urethral plate which makes the appearance of near natural⁽⁶⁾

In this study we compare the rate of complication in general and the difference in the percentage of each complication in these two methods.

Methods and Materials

A total of 50 patients were studied, Mathieu repair was done in 25 patients and Snodgrass repair is performed in 25 patients. All patients were operated under general anesthesia. A tourniquet was applied to maintain a bloodless field. A straight penis was confirmed by performing artificial erection.

For Mathieu flip flap repair a paramental based flap was raised with an intact blood supply and is anastomosed to the urethral plate after mobilizing the latter with two parallel incisions and the repair performed in three layers with polyglycolic acid(6\0) interrupted sutures with the knots to the inside the urethral lumen as shown in figure (1) .

For Snodgrass repair a U-shaped incision was made extending along the edges of the urethral plate to healthy skin 2mm proximal to the meatus, flaps mobilized for a tension free repair.

The urethral plate is then incised in the midline from the hypospadiac meatus distally. The incised plate was then tabularized over a (6-8)F stent using interrupted polyglycolic acid (6\0) sutures. Neourethra was then covered with a vascularized dartos flap harvested from subcutaneous tissue of dorsal prepuce skin as shown in figure (2).

All case was operated as day case surgery without hospital admission.

All cases received antibiotics prophylactically.

Stents was removed after 7-10days.

All patients were follow-upped for 3 months.

All cases were circumcised and the dorsal hood used to cover the neourethra.

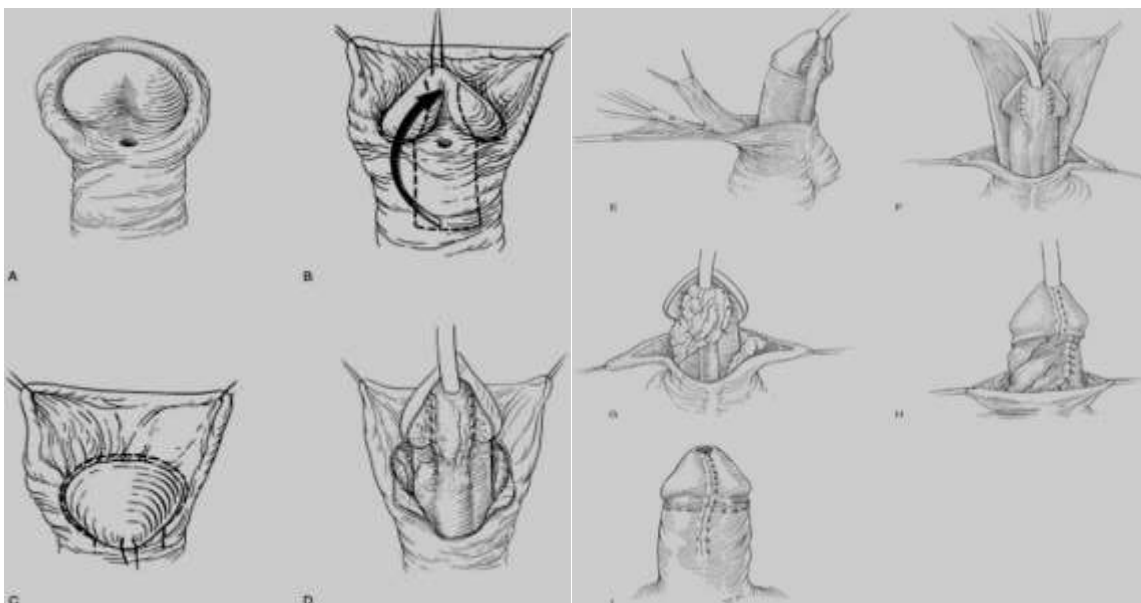
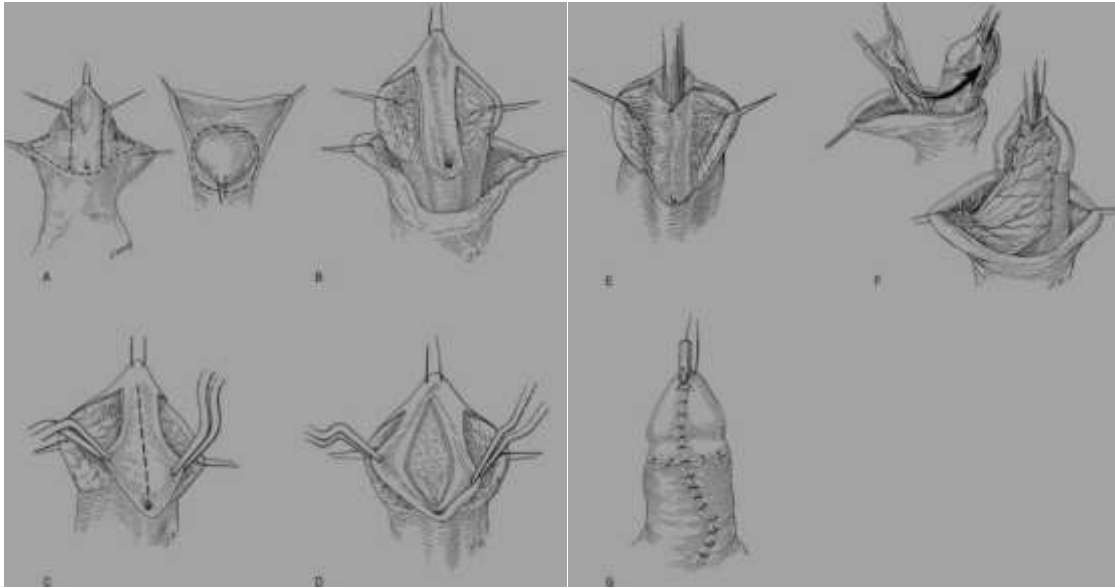


Figure (1) Matheu flap procedure



Figure(2) TIP (Snodgrass) urethroplasty

Results

Total of (50) cases were studied. Group 1 (n=25) underwent Mathieu repair and group 2 (n=25) had Snodgrass repair. Age ranged between 3 and 13 years with mean of 5 years coronal hypospadias was present in 25 (50%) and distal penile in 25 (50%) .

Urethral plate was healthy in all .presurgical hormonal treatment was not given to any patient. Operative time ranged from 50 to 90 minutes (mean=65min). all cases was done as a day case surgery without hospital admission.

Wound break down and urethral stricture was seen in 2 (8%) and 2 (8%) respectively in both groups while the incidence of urethro-cutaneous fistula is lower in Snodgrass group 1 (4%) than Mathieu flap group 2 (8%) and the incidence of meatal stenosis is higher in Snodgrass group 2 (8%) than Mathieu 1(4%)as shown in table(1).stream abnormality was seen only in cases with meatal stenosis and improved with dilatation of the meatus or meatotomy.

Cosmetic results were excellent with Snodgrass repair with a normal looking slit like meatus

Table (1): Complications in two groups

<i>complications</i>	<i>Group 1: Mathieu</i>	<i>Group 2: snodgrass</i>
Wound breakdown	2(8%)	2(8%)
fistula	2(8%)	1(4%)
Meatal stenosis	1(4%)	2(8%)
stricture	1(4%)	1(4%)

Discussion

Hypospadias is a common clinical problem with an incidence rate of 1 in 300 live male births⁽⁸⁾

In the majority of case the abnormal meatus is situated in the glans. coronal or in the distal part of the shaft. The goal of the repair is to perform functionally and cosmetically normal penis. More than 200 methods of repair have been introduced throughout the 125 years history of hypospadias repair. In earlier most of the distal lesion were repaired with meatal-based flap procedure, although this repair produced a glanular meatus, the opening was often rounded, in contrast to a slit like appearance of normal meatus.

This technique was first described by Mathieu in 1932 for distal hypospadias using a meatal based flap⁽⁹⁾, then in 1981 Wacksman reported his initial experience with this technique⁽¹²⁾ subsequently in 1987, Rabinowitz described catheter-less repair using the Mathieu flap repair⁽¹⁰⁾ although 1 and 2-layer neourethral anastomoses have demonstrated satisfactory results, the 2-layer technique has produced lower complications⁽¹¹⁾

Careful preservation of the vasculature and avoidance of overlapping suture lines produce a water-tight closure with minimal risk of postoperative fistula formation.

Mathieu repair also provide good functional results but cosmetics is more preserved in Snodgrass repair. Even now Mathieu repair is considered as the standard by some surgeons, for distal hypospadias.^(2,11,12)

Rich et al incised the urethral plate in the midline to improve the cosmetics of repair at 1989.⁽¹³⁾

Latter in 1994, Snodgrass advanced this concept by extending the incision of the urethral plate from the meatus to the tip of the glans. ⁽⁴⁾

This procedure allowed construction of the new urethra from the existing urethral plate. It was suggested that healing may occur through epithelialization of the relaxing incision without obvious scarring, allowing the incised edges to remain separated. ⁽¹⁴⁾

At the time being the (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 the normal looking meatus. ⁽¹⁵⁾.

Conclusion

Both methods of hypospadias repair are good and reliable with overall good results but the Snodgrass repair found to have better results regarding the overall success rate and better cosmetic appearance because it produce normal looking vertical slit urethral orifice while in Mathieu flap it produce transverse (fish mouth) and the results of this surgery become better with experience.

References

1. Ross MD, David FF. Distal hypospadias repair by the modified Thiersch-Duplay technique with or without hinging the urethral plate: a near ideal way to correct distal hypospadias. *J Urol* 1999;162:1156-8
2. Minevich E, Pecha BR, Wacksman J, Sheldon CA: Methieu Hypospadias repair: Experience in 202 patients. *J Urol* 1999; 162: 2141
3. Snodgrass WT. Tubularised incised plate hypospadias repair: Indications, techniques and complications. *Urology* 1999; 54: 6-11
4. Snodgrass WT. Tubularised incised urethral plate urethroplasty for distal hypospadias. *J Urol* 1994; 151: 464-5
5. Bath AS, Bhandari PS, Mukherjee MK. Repair of distal hypospadias by the tubularised incised plate urethroplasty: A simple versatile technique. *Indian J Plast Surg* 2003;36:23-25
6. Erol A, Baskin LS, Li YW. Anatomical analysis of the ure-thral plate: Why preservation of the urethral plate is import-ant in hypospadias repair. *Br J Urol Int* 2000;85:728-39
7. Firlit, C. F.: The mucosal collar in hypospadiac surgery. *J. Urol.* 1987; 137:80
8. 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
9. Mathieu P. Traitement en un temps de l'hypospadias balanique ou juxtabalanique. *J. Chir.* 1932, 39:481
10. Rabinowitz R.: Outpatient catheterless modified Mathieu hypospadias repair. *J Urol* 1987 138:1074
11. Hakim S, Merguerian PA, Rabinowitz R., Shortliffe LD, McKenna PH. Outcome analysis of the modified Mathieu hypospadias repair: comparison of stented and unstented repairs. *J Urol* 1996; 156:836
12. Wacksman J. Modification of the one-stage flip-flap procedure for repair of distal penile hypospadias. *Urol. Clin. N. Amer* 1981; 8:527

13. Rich MA, Keating MA, Snyder H, Mc C III, Duckett JW. Hinging the urethral plate in hypospadias meatoplasty. J Urol 1989;142:1551-3.
14. Bleustein CB, Esposito MP, Soslow RA. Mechanism of healing following the Snodgrass repair. J Urol 2001;165:277-9
15. Snodgrass WT, Lorenzo A. Tubularised incised plate urethroplasty for proximal hypospadias. BJU Int 2002;89:90-3
16. 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
17. Buson H, Smiley D, Reinberg Y, Gonzalez R. Distal hypospadias repair without stents: is it better? J. Urol 1994;151:1059
18. Imamoglu MA, Bakirta H: Comparison of two methods- Mathieu and Snodgrass- in hypospadias repair. Urol Int 2003; 71: 251-254
19. Kiss A, Nyirady P, Pirot L, Merksz M: Combined use of perimeatal based flap urethroplasty. Eur J Pediatr Surg 2003; 13: 383-5
20. Oswald J, Komer LI, Riccabona M: Comparison of the perimeatal-based flap (Mathieu) and the tubularized incised-plate urethroplasty (Snodgrass) in primary distal hypospadias. Br J Urol Int 2000; 85: 725-727