

TECHNICAL CONSIDERATIONS TO PREVENT MEATAL PROBLEMS IN SNODGRASS REPAIR

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Objectives To emphasize certain technical points which help in preventing meatal problems when using the Snodgrass repair for the treatment of hypospadias.

Patients and Methods From April 2000 to June 2003, 23 patients underwent Snodgrass repair for hypospadias. The following technical points were adhered to when reconstructing the meatus: (1) Tubularization of the urethral plate was done only up to the midglans. (2) The edges of the neomeatus were sutured to the edges of the glans wings. (3) The urethral stent used was at least 2 Fr. smaller than the size of the

neourethra. (4) A stitch was taken on the dorsal aspect of the glans to hold the stent in place and to prevent it from exerting pressure on the suture line of the approximated glans edges.

Results In all patients a normally slit glans was obtained. No meatal stenosis was seen in any of the patients with an average follow-up of six months.

Conclusion The technical aspects mentioned help in obtaining a normally slit meatus with very little risk of meatal stenosis.

Key Words: hypospadias, urethral plate, tubularization, stenosis, glans

INTRODUCTION

Warren Snodgrass first introduced the tubularized incised plate urethroplasty in 1994¹. Since then it has become a very popular repair for hypospadias. Given its versatility to correct different meatal variants, its low complication rate and the reliable creation of a normal appearing glanular meatus, the procedure has been used not only for distal but also for midpenile and proximal penile hypospadias^{2,3}. One of the features of this repair is the achievement of an excellent cosmetic result, especially a normal looking vertical slit-like meatus. However the incidence of meatal problems, namely stenosis, has been reported to range from 0%¹ to 14%⁴. Meatal problems can be the cause of an unsatisfactory cosmetic appearance, and they can also cause fistula⁵. Herein, I present my experience of 23 cases with emphasis on certain technical points which help in preventing meatal complications in the Snodgrass repair.

PATIENTS AND METHODS

From April 2000 to June 2003 a total of 23 cases of hypospadias underwent repair by the

Snodgrass technique. The age of the patients ranged from a minimum of 2 years to a maximum of 26 years. The age distribution of the patients is shown in Table 1.

Out of the 23 patients 13 had distal penile, 8 midpenile and 2 proximal penile hypospadias. The repair was done using the standard technique of the tubularized – incised plate urethroplasty. The neourethra was formed using 5/0 vicryl. The process of tubularization was started proximally from the site of the original meatus and proceeded distally. The following technical nuances were adhered to during the procedures:

- 1) The urethral stent used was either an infant feeding tube or a nelaton catheter and it was at least 2 Fr. smaller than the size of the neourethra.
- 2) The urethral plates were tubularized only up to the level of the midglans and not up to the tip of the glans.
- 3) The edges of the neomeatus were sutured to the edges of the glans wings using 5/0 chromic catgut.

Table 1: Age Distribution of Patients with Hypospadias

Age (Years)	No. of Patients
2 – 5	5
6 – 10	9
11 – 15	4
16 – 20	3
21- 26	2

4) After the completion of the procedure a stitch was taken at the dorsum of the glans. This was used to fix the stent.

In all patients the urethral stent was removed on the 10th postoperative day. They were followed up at one, three and six months. The meatus was calibrated at 3 and at 6 months in accordance with the age of the patients. The calibration varied from 10 Fr. in smaller boys to 16 Fr. in patients above the age of 15 years.

Despite the fact that all patients were asked to come back for regular follow-up at 6 monthly intervals, the average follow up was only 6 months (maximum 3 years, minimum 3 months). This is primarily due to the fact that the patients from outside the city were lost to follow-up. Many patients in this part of the world are unable to bear the travel costs due to their economic constraints, and thus it was most difficult to convince them to come for follow-up even during the first 6 months.

RESULTS

On follow up, the patient's stream was examined and the meatus was calibrated. The meatus was termed as normal when it fulfilled the following criteria:

- location – at the tip of glans.
- shape – vertical slit like
- good stream-lined flow of urine
- no meatal stenosis on calibration

All the patients had a normal looking meatus. Meatal stenosis was not seen in any of the patients. Out of 23 patients, two with proximal hypospadias had fistulae at the site of the original meatus, however the urethra was of

normal caliber and no meatal stenosis was seen.

DISCUSSION

The goal of hypospadias surgery is a penis that is both functionally and aesthetically normal. This requires a penis that is straight on erection with a vertically oriented meatus at the tip of the glans, thus promoting a single, coherent urinary stream⁶. Bracka showed that 72% of young adults felt that normal appearance was as important a goal as normal function⁷. Besides a vertical slit like meatus, it is imperative to avoid meatal stenosis. In a study done by Elbarky four of the first seven patients had a fistula which was associated with meatal stenosis in all cases. Hence, he advocated regular urethral calibration after Snodgrass repair in all patients⁵. Lorenzo and Snodgrass disagreed with this point of view and felt that routine calibration was not necessary⁸.

In the present series no meatal problems were seen which might be due to the strict observation of certain technical nuances while creating the meatus. To achieve a normal slit like meatus it is imperative that the tubularization of the urethral plates should end at the level of the midglans and not be done up to the tip of the glans. The appearance of a properly positioned meatus rather results from the closure of the glans wings from the meatus to the corona than from tubularizing the neourethra too far distally, which might create obstruction even in the absence of scarring.

In all patients in this series the edges of the neourethra were sutured to the edges of the glans wings. This helps in preventing the insinuation of the epithelial edges of the glans wings inside the glans wound. It also achieves primary healing between the two epithelial edges and prevents the edges of the neomeatus from getting buried beneath the glans wings when they are approximated and sutured ventrally. Thus, the suturing of the edges of the neomeatus helps not only in achieving an aesthetically good meatus but also prevents meatal stenosis.

Another technical consideration in this series has been the use of a urethral stent which is smaller than the size of the neourethra. Animal studies have proved that the midline incision through the dorsal aspect of the urethra heals without fibrosis by reepithelialization⁹.

The purpose of the stent is urinary drainage. It does not serve as scaffolding around which epithelial growth occurs. This has been confirmed by the fact that though the stent size used in the series by Warren Snodgrass in 1994 was 6 Fr, the size of the neourethra was greater than 10 Fr in all patients¹. In fact in the series by Steckler and Zaontz there was no high incidence of meatal stenosis or stricture formation despite not using a stent at all¹⁰.

Postoperatively the urethral stent is kept for about 10 days. By taking a stitch at the dorsal aspect of the glans the stent is fixed to it. Thus its inadvertent removal can be prevented. As the small sized stent is fixed more dorsally, it also prevents undue pressure on the ventrally approximated glans wings.

In conclusion, Snodgrass repair is associated with excellent results as established by a number of investigators and institutes. Tubularized incised plate urethroplasty is technically easy. It is a versatile technique associated with low complication rates and provides a vertical slit-like glanular meatus. However, meatal problems should be avoided. The few technical considerations mentioned above can help in achieving excellent functional and cosmetic results with virtually no meatal problems.

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RESUME

Considérations techniques préventives des problèmes de méat dans la réparation Snodgrass

Objectifs Mettre l'accent sur certains points techniques qui aident à la prévention des problèmes de méat quand utilisée le procédé de Snodgrass dans le traitement d'hypospadias. **Patients et Méthodes** Du mois d'avril 2000 à juin 2003, 23 malades ont subi une réparation pour hypospadias selon la technique de Snodgrass. Les points techniques suivants ont été respectés pendant la reconstruction du méat: (1) la tubularisation de la plaque urétrale a été faite jusqu'au mi gland seulement. (2) les bords du néo méat ont été suturés aux bords des ailes du gland. (3) le stent urétral utilisé était au moins 2 Fr. plus petit que la dimension du néo urètre. (4) un point a été pris sur le versant dorsal du gland pour tenir le stent en place et éviter d'exercer une pression sur la ligne de suture de rapprochement des bords du gland. **Résultats** Chez tous les patients une normalisation de la fente glandulaire a été obtenue. Aucune sténose du méat n'a été notée avec un suivi moyen de six mois. **Conclusion** Les aspects techniques susmentionnés aident dans l'obtention d'une fente méatale normale avec un très faible risque de sténose.

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