

Correction of anterior hypospadias without urethroplasty: glanular rotation procedure (the Hay technique)

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Objectives The aim was to present a simple technique for the correction of anterior hypospadias without meatal advancement or urethroplasty.

Background Most of the techniques described for the correction of anterior hypospadias had the risk of complications: recession, flaying of the glans, fistula, and meatal stenosis that is not accepted when dealing with a trivial anomaly that is done only for cosmetic correction. A simple technique for correcting granular and some forms of coronal hypospadias without meatal advancement or urethroplasty is presented.

Patients and methods From June 2013 to June 2016, 183 patients presented for surgical repair of glanular or coronal hypospadias. The technique of glanular rotation procedure (GRP) was applied only for those cases that matched the criteria settled after degloving of the penis with an incision made 2 mm proximal to the meatus touching the glans on both sides for 3–4 mm. Once the uppermost part of the meatus is at the same line with the upper end of the glans on both sides, the technique is applicable. The patients were followed in the OPD for 1 year after the repair for the evaluation of the results of the technique: the urinary stream, meatal size and position, presence of fistula, and the final cosmetic appearance.

Introduction

Hypospadias represents one of the most common, surgically challenging congenital defects that affect male external genitalia. Its incidence range from 1 : 250 to 1 : 300 live births [1]. According to the position of the meatus, this anomaly is classified as anterior in 65% of cases (meatal position is glanular or coronal in more than half of these cases), mid-penile in 15%, and posterior in 20% of cases [2]. Furthermore, the prepuce, the chordee and its type, penile rotation, shape of the glans, the urethral plate, and the corpora are other considerable factors in the description of the anomaly.

The aim in hypospadias reconstruction is to deliver a normal voiding and sexual function to the patient, in addition to a satisfying cosmetic appearance. Many surgical techniques are there, but the most important is to pick up the proper technique for each patient.

Glanular and coronal forms of hypospadias are minor and frequent forms that need correction mainly for cosmetic purposes, as the functional impairment is minimal. There are many described techniques for their reconstruction such as meatal advancement with glanuloplasty (MAGPI) or urethroplasty [3]. These techniques vary in their technical demands, success rates, early, and late onset of complications (e.g. the risk of flaying of the glans, recession or stenosis of the meatus, or even urethrocutaneous fistula

Results Ninety-eight out of 183 (53.6%) boys had matched the criteria for application of the GRP technique. Their age ranged from 6 months to 3 years. All but three had an apical, slit-like meatus with good stream without stenosis and 2–3 mm glans tissue encircling the ventral side of the meatus. Four cases had complications in the form of meatal stenosis in two cases, disruption of the glans in one case, and coronal fistula in one case. The overall complication rate was 4.1%.

Conclusion In properly selected cases, GRP is a simple efficient technique that has the advantage of reconstructing the glans over the urethra without the need of meatal advancement or urethroplasty. *Ann Pediatr Surg* 14:126–129 © 2018 Annals of Pediatric Surgery.

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formation) [2]. In this work, we describe the glanular rotation procedure (GRP) as a simple technique correcting most of the glanular and some of the coronal forms of hypospadias without meatal advancement or urethroplasty.

Patients and methods

From June 2013 to June 2016, patients presented to Ain Shams University Hospitals with either of the anterior hypospadias (glanular or coronal) were recruited to undergo GRP after proper assessment and selection. A written informed consent was taken from the parents discussing the surgical plan and the probability to switch from our new technique to another during surgery.

Proper patient selection for the technique was considered the backbone of successful reconstruction. Selection of patients ran in two successive steps. The first one was accomplished in the clinic, whereas the second step was completed intraoperatively after degloving of the paramental skin.

Patients were meticulously evaluated in the clinic as regards the meatus and the glans. Patients with megameatus, cleft glans, or urethral meatus proximal to the coronal sulcus were excluded from the study (first step selection).

Although uncommon in distal forms of hypospadias, degree and the type of chordee were assessed. The state

of the ventral skin and the degree of penile rotation were carefully inspected.

The study protocol was fully approved by ethical committee, Pediatric Surgery Department, Ain Shams University.

Technique

Traction suture was applied to the glans and a 10 F catheter was inserted through the meatus to the urethra, but not reaching the bladder.

Incision began ventrally just on the edge of the urethral meatus circumscribing it (Fig. 1), then it was extended on the edges of the glans bilaterally leaving no modified skin (Fig. 2); thus, the glanular tissue is denuded for some distance (2–3 mm) lateral to the meatus on both sides. The incision is completed circumferentially around the penis leaving a butterfly cuff of the inner preputial skin (Fig. 3). After degloving of the parameatal skin and the distal penile shaft, the patient was reassessed to determine the final position of the meatus (the second step selection).

Fig. 1



The line determines the circum-meatal incision.

Fig. 2



Extension of the incision leaving no modified skin on both sides of the meatus.

The GRP technique was applied to patients having their meatus within the distal half of the glans (uppermost end of the meatus and tip of the glans on both sides at the same level; Fig. 4). Other patients showed an 'M-shaped' relation between the tip of the meatus and the tip of the glans (Fig. 5), where the central dependent part of the 'M' was representing the meatus and its peaks were representing the top of the glans. This group of patients was not amenable to GRP.

Reconfiguring the glans around the urethra was carried on using interrupted 6-0 vicryl sutures, starting by the uppermost two points of the denuded glanular tissue on the sides of the meatus, bringing them to the midline ventrally just proximal to the meatus. The rotation procedure was continued from up downwards along the whole length of the denuded glans till the coronal sulcus. Finally, the lateral edges of the butterfly cuff met each other in the midline ventrally, and the two adjacent edges were brought together by interrupted 6-0 vicryl sutures.

The procedure was accomplished by removal of excess skin after ensuring good adequate skin cover ventrally. Penile shaft skin was fixed to the butterfly cuff circumferentially by 6-0 interrupted vicryl sutures. Urethral catheter was removed after completion of the procedure, no urinary diversion was needed. A circumcision-like dressing was used for 48 h.

All cases were operated on a day-case basis and were instructed to attend the outpatient clinic for follow-up after 1 week, 1 month, 6 months, and 1 year after the surgery. Parents were advised to observe their child's urinary stream regularly at home. They were encouraged to seek advice by phone or even through clinical visits beyond the schedule if they were unsatisfied.

We stated the complications as meatal stenosis, meatal regression, disruption of the glans, persistence of the chordee, urethrocutaneous fistula, or cosmetic disfigurement.

Results

During the study period, 183 boys with anterior hypospadias (80 glanular and 103 coronal) presented to our outpatient clinic. After the first step selection, 26 patients were excluded; 16 patients due to cleft glans and 10 patients with megameatus. Another 59 patients were excluded after the second step selection, 28 patients with meatal stenosis and 31 patients showed the 'M' configuration.

Ninety-eight (53.6%) patients were chosen to have their reconstruction with the GRP. They were 69 out of 80 (86.25%) with glanular hypospadias and 29 out of 103 (28.2%) with coronal hypospadias. Their ages ranged from 6 months to 3 years (mean: 16 months).

Twenty-nine patients had skin chordee that was released by skin degloving only.

Ninety-four cases had an apical, slit-like meatus with good stream without stenosis and 2–3 mm glans tissue encircling the ventral side of the meatus (Fig. 6). Two cases were complicated by disruption of the glans and coronal fistula. The primary pathology was coronal

Fig. 3



The dashed line draws the butterfly incision laterally.

Fig. 4



Uppermost end of the meatus and tip of the glans are at the same level.

Fig. 5



M-shaped relation between the meatus and the tip of the glans after degloving.

hypospadias in both of them. Meatal stenosis occurred in another two cases that needed dorsal meatotomy. The overall complication rate was 4.1%.

Discussion

Hypospadias surgery is challenging owing to the wide variety of the anomaly and the fear of imperfect results,

either functionally or cosmetically. Cosmetic appearance was considered secondary to the functional outcome. In the past, surgeons preferred to keep patients suffered anterior forms of hypospadias without correction. This concept can be attributed to the lack of functional impairment associated with this mild form of the anomaly and to the complications that might be more severe than the untreated anomaly [3]. This view was justified since the advent of MAGPI [4] that offered a

Fig. 6



After 6 months follow-up.

simple one-stage technique to bring the meatus to the tip of the glans without urethroplasty. Moreover, this technique can be done as a day case and without leaving urethral catheter.

Duckett and Snyder [2] reported their cumulative results of 1111 cases repaired with MAGPI from 1978 to 1990. They stated (0.45%) fistulas, (0.6%) meatal retraction, (0.09%) residual chordee, and no meatal stenosis. Reoperation was needed in 1.2% of patients. Livne *et al.* [5] had only three cases with minor cosmetic disfigurement following MAGPI in 66 cases, there was no meatal stenosis or retraction. Others reported significant rates of meatal retraction that may occur even late, after initial apical position of the meatus [6–8].

The MAGPI procedure gained popularity for glanular and coronal forms of hypospadias, despite its inability to deliver slit-like vertically oriented meatus, which is gained easily by using tabularization techniques. We believe that the worldwide acceptance of MAGPI is essentially due to its simplicity, satisfying outcome, and low complications rate when patients are properly selected.

In this study, we are describing a simple technique to reconstruct selected cases of glanular and coronal forms of hypospadias. This technique depends mainly on the

final position of the meatus after parametatal skin degloving and the configuration of the glans. Subramaniam *et al.* [9] stated that the final judgment of the meatus position should be made after surgical degloving of the penis and that is why the decision of the appropriate technique for reconstruction was made intraoperatively.

The periurethral part of the incision line gave us the chance to get rid of the parametatal skin, which was known to cause delayed meatal regression. This incision permitted reconfiguration of the glans around the distal urethra and meatus without elevating the glanular wings. In our opinion, glans mass closure provides good support to the urethra and allows better alignment of the glans layers, minimizing tissue trauma, and fibrous tissue formation.

Repair was complicated in one patient by disruption of the glans. This complication was attributed to the small size of the glans, which necessitated repair under tension. Assessment of the glans size seems to be another essential factor for successful reconstruction. Further study is required to find an objective way to assess the adequacy of the glans for tension-free mass closure.

Conclusion

GRP (the Hay technique) is applicable in highly selected cases. This technique is targeting a smaller spectrum of cases than MAGPI and tubularization techniques. It can provide slit-like apical meatus.

Conflicts of interest

There are no conflicts of interest.

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