

## Meatal Mobilization and Glanuloplasty: A Viable Option for Coronal and Glanular Hypospadias Repair

Mahmoudreza Moradi, Babak Kazemzadeh, Brandy Hood, Haress Rezaee, and Kaveh Kaseb

<b>OBJECTIVE</b>	To present the meatal mobilization with glanuloplasty inclusive (MMGPI) modification of meatal advancement and glanuloplasty inclusive.
<b>MATERIALS AND METHODS</b>	A total of 120 patients with anterior hypospadias underwent MMGPI between September 2008 and October 2014 at Kermanshah University of Medical Sciences. Satisfactory outcomes were defined as continuous straight urinary flow and catheterization of new meatus without difficulty. Cosmetic outcomes were considered acceptable if patients maintained a slit-like meatus at the glanular tip. Patients were examined at 1 week, 1, 3, 6, 12, and 24 months.
<b>RESULTS</b>	The 120 patients with anterior hypospadias underwent MMGPI. There were no hematoma, meatal necrosis, or other early complications. In patients with glanular hypospadias, there were no meatal regressions or stenosis, all voiding patterns were normal, and all patients maintained a slit-like meatus at the glanular tip. Two patients with coronal hypospadias had meatal stenosis and 2 patients had meatal regression. Five patients with sub-coronal hypospadias had 2-mm meatal regression with downward sloping urinary stream, and 2 patients had meatal stenosis. In all, meatus remained distal to the preoperative meatus with no necrosis. Small sample size was the major limitation of this study.
<b>CONCLUSION</b>	MMGPI represents a viable option for glanular and coronal hypospadias repair. UROLOGY 94: 204–207, 2016. © 2016 Elsevier Inc.

Hypospadias is one of the most common anomalies in the human genitourinary system, with an incidence of 1 in 300 male newborns.<sup>1,2</sup> The meatus location may be anywhere from just below the tip of the glans to the perineum, and hypospadias is divided into three types based on the position of the meatus: posterior, middle, and anterior.<sup>3</sup> Anterior hypospadias is the most common type, occurring in 65% of cases. Among anterior hypospadias, 15% are glanular, 50% are coronal, 30% are sub-coronal, and 5% are megameatus intact prepuce.<sup>2</sup> Together, glanular and coronal hypospadias represent a significant proportion of cases. Meatal advancement and glanuloplasty inclusive (MAGPI) represents one of the most common methods for repair of glanular and coronal hypospadias, first described in 1981.<sup>4</sup> In this surgical ap-

proach, the hypospadias meatus is advanced to the tip of the glans without tubularization. The most significant complications of MAGPI are meatal retraction or regression, seen in up to 22% of cases,<sup>5</sup> and glanular chordee,<sup>6</sup> in which there is ventral deflection of the glans. Both complications are associated with unsatisfactory cosmetic outcomes. For these reasons, there are numerous reports of modifications to improve functional and cosmetic results of the MAGPI. The aim of this study is to describe our experience with a modification of the MAGPI procedure that we have named meatal mobilization with glanuloplasty inclusive (MMGPI).

### MATERIALS AND METHODS

Between September 2008 and October 2014, 120 boys underwent MMGPI. The inclusion criteria were age less than 12 years with glanular, coronal, or sub-coronal hypospadias. Patients with chordee, previous repair, or circumcision were excluded. All parents of the patients included in this study completed the written consent. The basic preoperative evaluation included history, physical examination, and basic laboratory tests.

All procedures were performed under general anesthesia and by 1 surgeon. The surgical technique is as follows. After

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From the Urology Department, Imam Reza Hospital, Kermanshah University of Medical Sciences, Iran; and the Wake Forest University, Winston-Salem, NC

Address correspondence to: Mahmoudreza Moradi, M.D., Urology Department, Tissue Engineering & Regenerative Medicine (TERM), Imam Reza Hospital, Kermanshah University of Medical Sciences, Iran. E-mail: [drmmoradi@gmail.com](mailto:drmmoradi@gmail.com), [drmoradi@kums.ac.ir](mailto:drmoradi@kums.ac.ir)

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insertion of a 6-8 French nelaton catheter and fixation of a glanular stay suture, a conical incision was made on the ventral aspect of the glans between the meatus and the tip of the glans. The incision was extended around the posterior aspect of the hypospadiac meatus. A triangular strip of the glans was removed with iris scissors, and the posterior aspect of the urethra was released until completely mobilized and the urethra reached the tip of the glans without tension. The meatus was fixed to the glans with 3 golden suture 6-0 polyglactin (VICRYL, Ethicon) sutures. For glanuloplasty, the epithelium and the skin in the submeatal region were removed, and the glanular wings were fixed to the urethra and to each other with anchoring sutures, creating a slit-like meatus. A routine circumcision was then performed. Please see [Figure 1](#) for a diagram of the surgical technique. The wounds were dressed and the nelaton catheter was fixed in place for 24 hours. Patients were usually discharged with analgesic on postoperative day 1. An adrenaline solution (1:100,000) was routinely administered at the incision line before the procedure and a tourniquet applied, if necessary, for control of bleeding.

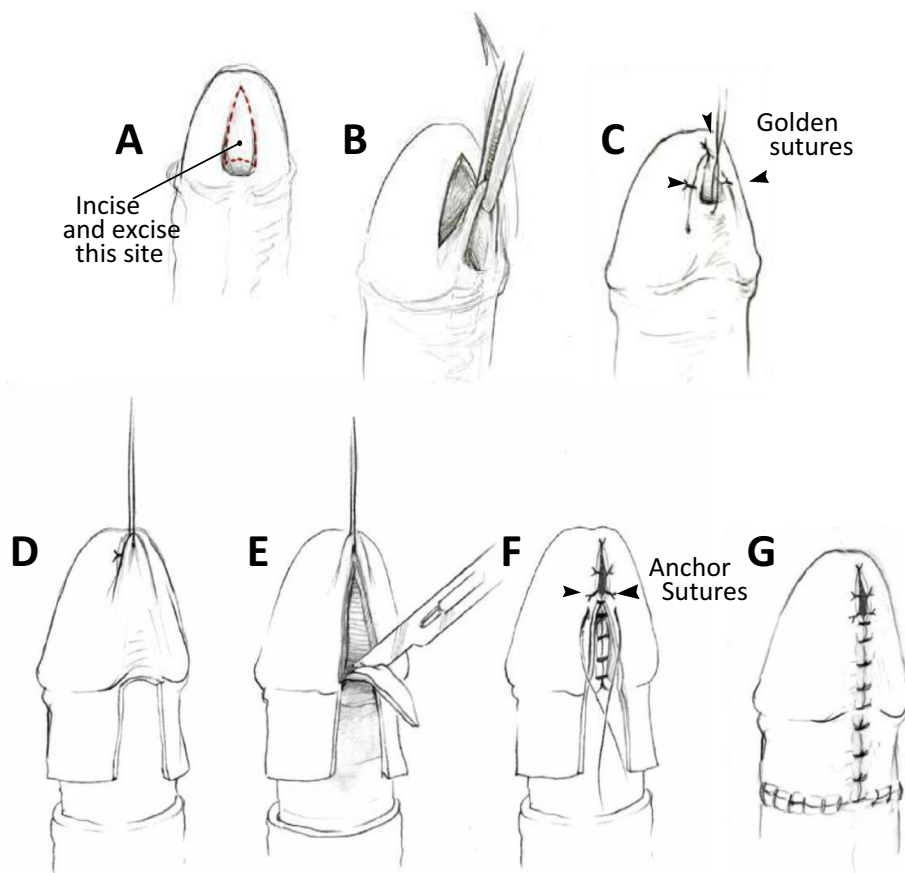
All of the patients were examined at 1 week, 1, 3, 6, 12, and 24 months after discharge. All data including age, meatus location, voiding pattern before and after surgery, and postoperative complications, such as meatal necrosis, meatal retraction, meatal stenosis, fistula, and cosmetic results were collected for each patient. We defined satisfactory outcomes as continuous and straight urinary flow and catheterization of the new meatus with 6 or 8 French catheter without difficulties. Cosmetic outcomes were considered acceptable if the patients maintained a slit-like meatus at the tip of the glans. Degree of retraction was measured in millimeters to evaluate for meatal regression.

## RESULTS

This study included 120 patients with anterior hypospadias, but 17 patients discontinued cooperation and were finally excluded, leaving 21 patients with glanular, 62 with coronal, and 20 with sub-coronal hypospadias, who underwent the MMGPI technique. The mean age was  $3.2 \pm 1.4$  years (range 1-12 years). There were no cases of hematoma, meatal necrosis, or other early complications in any patients. In glanular hypospadiac patients, there were no cases of meatal regression or meatal stenosis, and functional and cosmetic outcomes were satisfactory ([Figs. 2,3](#)). Two patients out of 62 cases (3.22%) with coronal hypospadias had meatal stenosis, and 2 patients out of 62 cases (3.22%) had meatal regression. Five patients out of 20 cases (25%) with sub-coronal hypospadias had 2-mm meatal regression with downward sloping urinary stream, and 2 patients out of 20 cases (10%) had meatal stenosis. However, in all patients, the neomeatus remained more distal than the preoperative meatus. No patients required a second procedure.

## DISCUSSION

Hypospadias is a common congenital anomaly in which the meatal orifice opens to the ventral aspect of the penis instead of the apex of the glans. About 65% of hypospadias cases are anterior and of these 15% are glanular, 50%



**Figure 1.** Diagram of meatal mobilization with glanuloplasty inclusive (MMGPI) technique. (Color version available online.)

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