



The slit-like adjusted Mathieu technique for distal hypospadias

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Abstract

Purpose: The aims of this study were to describe the slit-like adjusted Mathieu technique (SLAM) for distal and midpenile hypospadias and report the midterm follow-up.

Materials and Methods: Between January 2005 and December 2009, the SLAM technique was performed in 923 patients. The key modification is the design of a converging incision and the technique of suturing. Patient age ranged between 4 months to 30 years (mean, 1.5 years). The records of 872 patients who maintained regular follow-up were reviewed. The technique was performed in all forms of distal hypospadias, regardless of the size of the glans or the degree of glans clefting. Cutaneous chordee was corrected by skin mobilization. Follow-up period ranged from 22 months to 6 years (mean, 38 months). A transurethral catheter was used for 1 to 3 days.

Results and Complications: Satisfactory results were obtained in 848 patients (97%). Fourteen patients developed fistulae. Four patients developed meatal stenosis. Six patients had wound dehiscence.

Conclusions: The SLAM technique is a reliable technique for correction of distal and midpenile hypospadias with persistent good results. It avoids the drawbacks of the classic Mathieu (a transverse rounded meatus that is not terminal). Multiple-layer closure and careful attention to technical details contributed to a 3% complication rate in primary distal hypospadias.

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The Mathieu technique [1] has withstood the test of time for 80 years, with a study that reported a success rate of 100% in 204 consecutive patients [2]. The major drawback of the original Mathieu technique is the final appearance of the meatus (a fish-mouth meatus that is not at the tip of the glans). The technique has become less

popular during the past 15 years in favor of the tubularized incised plate (TIP) technique partly because of the slit-like meatus that could be achieved with the TIP technique [3].

The author has been performing a modification of the Mathieu technique since 1986. There has been continuous evolution and modifications through the years from Y-V modified Mathieu (1992–2002) [4,5] and inverted Y-V modified Mathieu (2003–2004) to the slit-like adjusted Mathieu (SLAM) technique, since 2005. The aim is to use the optimum operation that consistently produces good

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functional as well as cosmetic outcome (slit-like meatus) of the penis with a low complication rate.

1. Patients and methods

The SLAM technique was performed on 923 patients with distal and midpenile hypospadias from January 2005 to December 2009 after obtaining the approval of the institutional ethics committee. Fifty-one patients were lost to follow-up, and the remaining 872 patients constitute the present cohort for this report. Patients' age ranged from 4 months to 30 years (mean, 1.5 years).

For the purposes of the study, distal hypospadias includes all types of hypospadias where the meatus lies distal to the midshaft. The reason is to avoid the hair-bearing scrotal skin. The morphology of the hypospadiac penis and associated anomalies are summarized in Table 1. Patients with severe deep chordee distal to the hypospadias meatus or with complicated distal hypospadias were not included in the present study.

2. Surgical technique

Under general anaesthesia and caudal block, a 4/0 nylon traction suture is placed through the tip of the glans. A tourniquet is applied at the base of the penis, and an artificial erection test is performed (Fig. 1).

2.1. Careful assessment of the penis is performed

If the native urethral meatus is narrow, it was incised proximally to create a wide spatulated meatus (107 patients). If the urethra proximal to the meatus was thin and paper-like, it was incised to reach a healthy urethral tissue covered with corpus spongiosum.

The degree of glans clefting (grooving) is evaluated. The limits of the final meatus are marked with the aid of an appropriate catheter according to the caliber of the proximal normal urethra and the age of the patient. If the glans is clefted (grooved), the lateral borders of the groove are marked and will constitute the roof of the neourethra. If the

glans is flat or small, a narrow strip (5 mm in width) is marked, allowing an adequate width of the glanular wings. A catheter of appropriate size (according to the caliber of the proximal urethra) is introduced into the bladder.

2.2. Flap design

The boundaries of the urethral plate are outlined. In patients with a globular flat glans, special attention was given to create large glanular wings, and the urethral plate could be outlined as narrow as 3 mm in width (Fig. 1A). The narrow urethral plate was compensated by a wider flap from the paramental flap proximal to the meatus. At the distal end of the urethral plate, the 2 incisions converge toward each other to allow free mobility of the glanular wings to wrap around the neourethra to produce a slit-like meatus free of sutures (Fig. 1A).

Incision of the flap begins at the coronal sulcus using a scalpel or scissors and continued distally very deep into the glans to create large glanular wings. Proximally, the flap was elevated using sharp scissors taking care to include dartos fascia and part of the corpus spongiosum with the flap (Fig. 1B). The redundant epithelial dog ear is removed from the angle of the flap to reduce the chances of fistula formation at this common fistula site (Fig. 1C).

2.3. Urethroplasty

The flap is sutured to the tip of the glans, 2 mm from the distal end of the incision in the glans (Fig. 1D). The idea is to keep the meatal edges free of any sutures and to have a smooth, near-normal meatus. A continuous subcuticular running polyglactin 6/0 suture on a cutting needle was the standard suture for urethroplasty. The subcuticular suture is continued until the distal stitch is reached, and then the surgeon returns back with same suture as a running suture approximating the flap fascia to the depth of the glans and the shaft of the penis (double breasting). Thus, there will be a single knot for the whole 2 layers (Fig. 1E). In older children and adults, the author inserts a third layer with the continuous suturing approximating the wall of the neourethra to the glanular wings.

2.4. Meatoplasty and glanuloplasty

A small V is excised from the apex of the paramental flap (Fig. 1E), and the 2 edges of the final meatus are sutured together to the center of the V, creating a slit-like meatus using a single 7/0 polyglactin stitch (Fig. 2). No other sutures are needed in the meatus. The glanular wings are closed using interrupted polyglactin 7/0 transverse mattress sutures. The remaining wound is closed using a continuous 7/0 polyglactin mattress stitch (Fig. 1G).

Table 1 Details of 872 patients who underwent the SLAM technique between January 2005 and December 2009

Location of the meatus	No. of patients
Coronal hypospadias	289
Distal penile hypospadias	508
Midpenile hypospadias	34
Megameatus intact prepuce	41
Total	872

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