

Y-V Glanuloplasty Modified Mathieu Technique With Versus Without a Urethral Stent in the Management of Distal Hypospadias

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ABSTRACT

INTRODUCTION: Reported complication rates from the Y-V glanuloplasty modification to the Mathieu technique have varied and may be related, at least in part, to inconsistent use of the recommended stent. The purposes of the present investigation were to: (1) describe the intraoperative and postoperative complications associated with the Y-V glanuloplasty modification, and (2) compare results from patients receiving a stent with patients not receiving a stent.

METHODS: A total of 56 patients with distal hypospadias were included in this prospective study. Their mean age was 4.5 years (range, 3-8 years). All patients had a Y-V glanuloplasty modified Mathieu technique. They were randomly divided into 2 groups: group 1 (n = 30) had surgery without a urethral stent; group 2 (n = 26) had surgery with insertion of a 10 Fr urethral catheter (Nelaton draining catheter) down to the bladder. The stent was removed 5 days postoperatively. Follow-up evaluation occurred 5-7 days after surgery and then monthly for 12 months and every 3 months for 2 years. Complications were recorded at each visit and compared between groups.

RESULTS: A total of 13 patients (43%) in group 1 (without a stent) had complications that included dysuria (n = 10), edema of the glans that resolved after a few days (n = 2), and secondary bleeding due to severe infection and rupture of the flap that required reoperation (n = 1). A total of 7 patients (27%) in group 2 (with a stent) had complications. After removal of the stent, 4 patients had urgency and 3 patients had dysuria that disappeared after few days. None of the patients with a stent had infection or edema of the glans. At the end of the follow-up period, all patients in both groups were in good condition, with the neomeatus located at the tip of the glans. There were no long-term complications.

CONCLUSIONS: Y-V glanuloplasty modified Mathieu technique with meticulous subcuticular sutures has a high success rate and is suitable for distal hypospadias. Based on our results and those of previous studies, we do not recommend a catheterless technique.

KEYWORDS: Y-V glanuloplasty; Modified Mathieu; Distal hypospadias; Urethral stenting; Subcuticular sutures

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Abbreviations and Acronyms

TIP, tubularized incised plate

INTRODUCTION

In 1928, Mathieu described a single-stage, meatal-based flap technique to repair the distal forms of hypospadias. Details of this operation with its preliminary results were reported in 1932 [1]. Later studies showed successful results with this technique [2-4], leading to its popularization. The most common side effect of the Mathieu technique is meatal stenosis, which seems to be avoided by using the Y-V glanuloplasty surgical modification [5].

Results of some studies using the Y-V glanuloplasty modification to the Mathieu technique indicate that it is an excellent procedure for repair of distal hypospadias. However, reported complication rates have varied and may be related, at least in part, to inconsistent use of the stent that is recommended in the modified Mathieu procedure. Therefore, the purposes of the present investigation were to: (1) describe the intraoperative and postoperative complications associated with the Y-V glanuloplasty modification, and (2) compare the results from a group of patients receiving a stent with a group of patients not receiving a stent.

METHODS

This was a prospective study. The protocol was reviewed by the Cairo University Hospital Committee. The parents of the patients provided informed consent; both surgical procedures were described.

Participants

A total of 56 patients with distal hypospadias were included in this study. Their mean age was 4.5 years (range, 3-8 years). Although this is not a typical age range for hypospadias repair, patients are coming to our office at this age. Exclusion criteria were: (1) severe chordee distal to the hypospadias meatus, (2) midshaft or proximal-shaft hypospadias, or (3) cone-shaped glans. A flat-shaped glans was not a contraindication.

Surgical Procedure

All patients had a Y-V glanuloplasty modified Mathieu technique. The patients were randomly divided into 2 groups. Group 1 (n = 30) had the operation without a urethral stent; group 2 (n = 26) had the procedure with insertion of a 10 Fr urethral catheter (Nelaton draining catheter) into the bladder.

The surgical procedures were based on those described previously [6]. The steps are illustrated in Figure 1a and Figure 1b. Loop magnification was not used. Under general anesthesia, a 5-0 nylon traction suture was placed on the glans. The procedures indicate that it should be central, transversally applied, and just

dorsal to the site of the neomeatus. A tourniquet was placed at the root of the penis after compressing it for not more than 20 minutes. The erection test was applied and any chordee present was evaluated. A Y-shaped incision was then outlined on the glans. The centre of the Y was exactly at the tip of the glans, where the tip of neomeatus would be located. The Y-shaped incision was made deep into the tissue and resulted in 3 flaps: 1 upper and 2 lateral. A core of soft tissue from the glans (corpus spongiosum) was excised from the bed of each flap to create a space for the neourethra. The Y shape was sutured as a V, using continuous through-and-through 6-0 vicryl sutures.

For both groups of patients, the hypospadias meatus was evaluated to accommodate a size 10 Fr catheter. It was inserted into the meatus down to the root of the penis until the end of the operation. At that time, the catheter was removed for patients in group 1 and it was introduced down to the bladder for patients in group 2. All other procedures were the same.

All patients then received a U-shaped incision. It reach the tip of the glans, taking the following points into consideration: (1) the length of the flap was slightly longer than the distance between the meatus and the designed tip of the neomeatus, (2) the 2 longitudinal incisions had to diverge away from the hypospadias meatus to allow for adequate blood supply to the flap. We used a continuous subcuticular (ie, not as deep as the full thickness of the flap) running vicryl 6-0 suture a few millimeters proximal to the original meatus, to create a knot away from the new urethra. The subcuticular suture was continuous to the tip of glans; it then went back with running stitches that approximated the flap fascia to the depth of the glans and the shaft of the penis. A small V was excised from the apex of the meatal flap and the meatus was reconstructed with simple vicryl 6-0 sutures to achieve a slit-like meatus. The glanular wings were closed using interrupted transverse mattress 6-0 vicryl sutures. The remaining wound was closed using continuous mattress or interrupted subcuticular vicryl stitches.

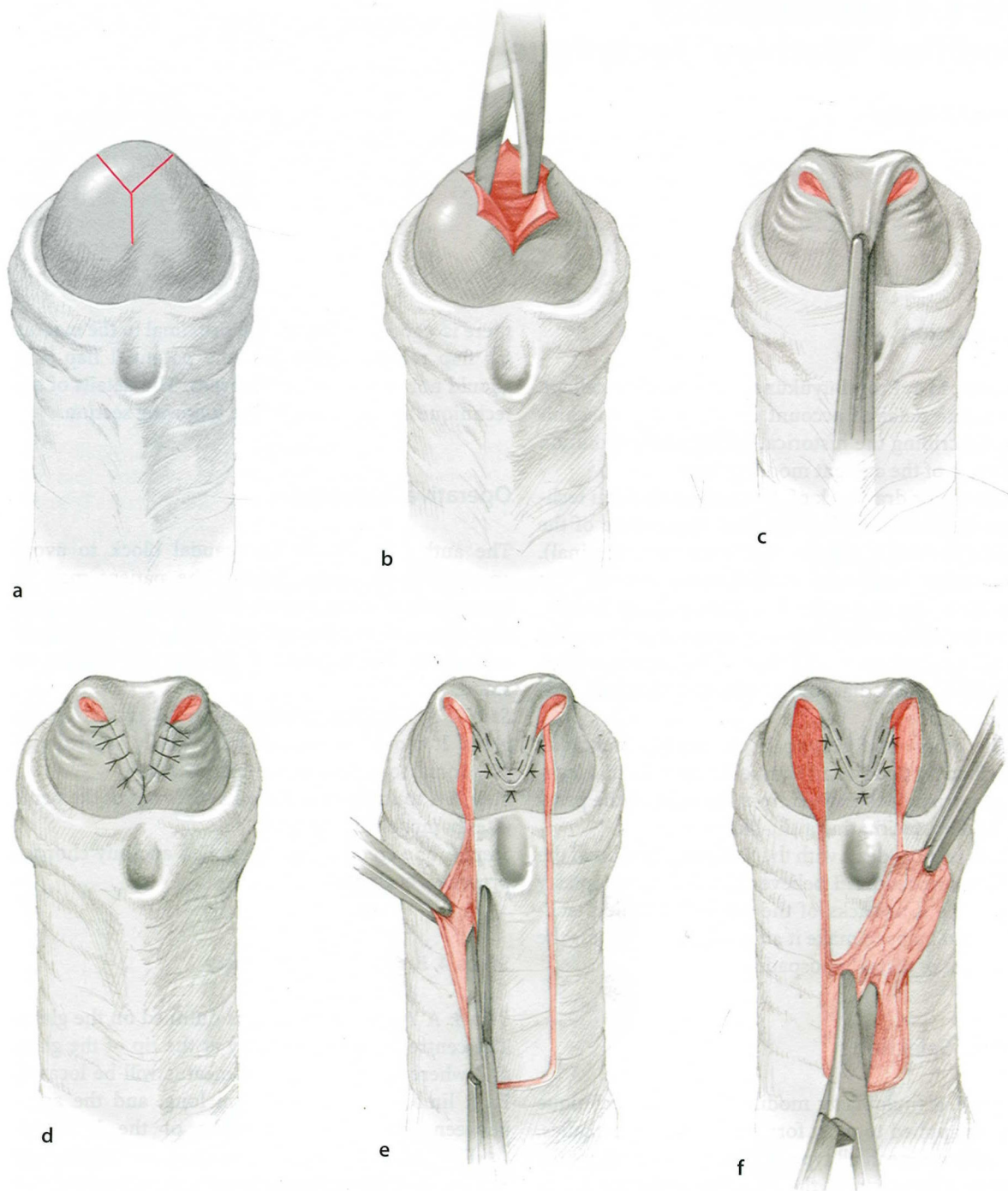
At the end of the operation, local gentamicin ointment was applied to the surgical area. A compression dressing was applied for 6 hours for hemostasis and then removed. All patients were discharged on the same day. They were given local gentamicin and oral sulfamethoxazole and trimethoprim.

Follow-up Evaluations and Data Analysis

Patients in Group 2 had the catheter removed 5 days after surgery. Follow-up evaluation of all patients occurred 5-7 days after surgery and then monthly for 12 months and every 3 months for 2 years. Patients were examined and complications

Figure 1a. Illustration of the Y-V Glanuloplasty Modified Mathieu Technique.

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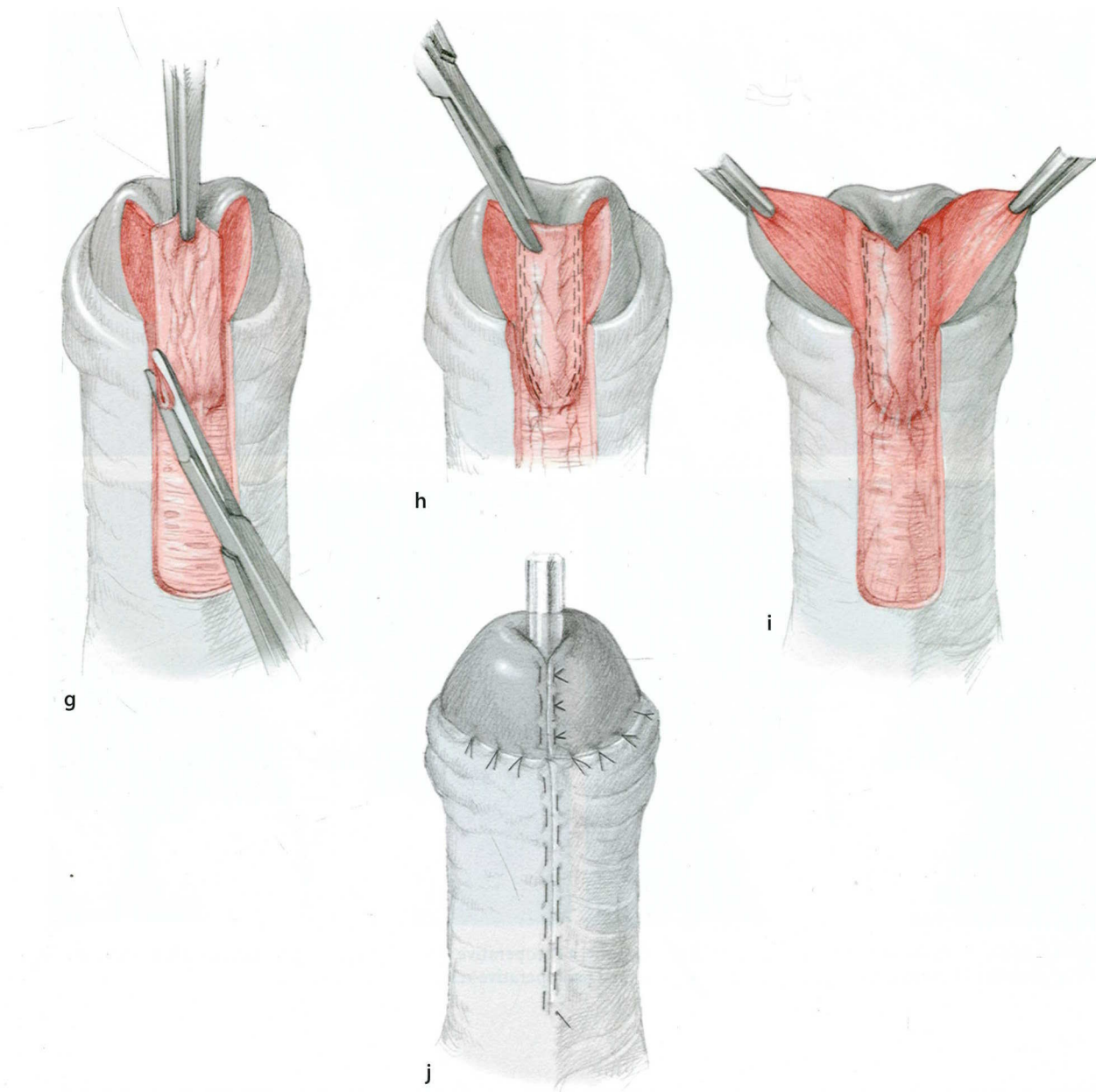


(a) Y-incision; (b) elevation of the 3 flaps and coring to make a space for the new urethra; (c,d) Y sutured as a V with preservation of the dog ears; (e) U-shaped flap; (f) the flap is elevated, with care taken to preserve its fascia.

Figure 1a is adapted with permission from Hadidi AT. The Y-V glanuloplasty modified “Mathieu” technique. In: Hadidi AT, Azmy AF, eds. *Hypospadias Surgery, An Illustrated Guide*. Berlin-Heidelberg: Springer-Verlag; 2004:150-151.

Figure 1b. Illustration of the Y-V Glanuloplasty Modified Mathieu Technique, Continued.

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(g) the dog ear is excised from both lateral ends of the flap; (h) urethroplasty is performed in 2 layers; (i) a V is excised from the tip of the flap; (j) completed procedure with catheter in situ.

Figure 1b is adapted with permission from Hadidi AT. The Y-V glanuloplasty modified "Mathieu" technique. In: Hadidi AT, Azmy AF, eds. *Hypospadias Surgery, An Illustrated Guide*. Berlin-Heidelberg: Springer-Verlag; 2004:150-151.

were recorded at each visit. We compared the number and type of complications recorded for the group with a catheter and the group without a catheter.

RESULTS

There were no intraoperative complications for any of the patients. Postoperative complications for the patients in group 1 and group 2 are contained in Table 1. Follow-up of the patients was continued for 2 years, with an average of 18 months.

A total of 13 patients (43%) in group 1 (without a stent) had complications. These complications included dysuria (n = 10), edema of the glans that resolved after a few days (n = 2), and secondary bleeding due to severe infection and rupture of the flap that required reoperation (n = 1). A total of 7 patients (27%) in group 2 (with a stent) had complications. After removal of the stent, 4 patients had urgency and 3 patients had dysuria that disappeared after few days. None of the patients with a stent had infection or edema of the glans.

At the end of the follow-up period, all patients in both groups were in good condition, with the neomeatus located at the tip of the glans. There were no long-term complications such as meatal stenosis or urethrocutaneous fistulae.

DISCUSSION

There are a number of previous reports by authors who did not use a stent as part of the modified Mathieu technique for distal hypospadias. Rabinowitz [3] first reported using a catheterless procedure in 1987. Other investigators followed him by using subcuticular sutures with no stent or suprapubic diversion in their patients [7-11]. The complication rates reported from these studies were variable, ranging from 15% [10] to 18-20% [8,11]. Ravasse et al [12] did not report any case of urethrocutaneous fistula where a dorsal subcutaneous flap was used to cover the

neourethra. The lowest complication rate (< 5%) was cited by Gough et al [13] in their book chapter on Mathieu hypospadias repair, but these authors still did not recommend a catheterless technique due to the high incidence of dysuria and late complications reported in other studies.

We used the Y-V glanuloplasty modified Mathieu technique in 56 boys with distal hypospadias. There were more complications in the group without a stent than in the group with a stent (43% and 27% of the patients, respectively). The overall success rate was higher (100%) in the group with a catheter than the group without a catheter (97%), because 1 patient in the latter group developed rupture of the flap secondary to wound infection and required reoperation. There was no stenosis of the urethral meatus in either group of patients. Fathi and Pintér [14] evaluated the impact of an indwelling transurethral catheter on surgical outcome and postoperative micturation with Y-V glanuloplasty modified Mathieu repair for primary hypospadias. They reported that a transurethral catheter avoids distressing postoperative micturation and minimizes the chance of urethrocutaneous fistula and meatal stenosis.

Wilkinson et al [15] performed a meta-analysis of the literature to compare complication rates after distal hypospadias surgery using the tubularized incised plate (TIP) and Mathieu techniques. They compared 1872 TIP repairs and 1496 Mathieu repairs. The authors found that there was a significantly increased incidence of urethral fistulae with the Mathieu technique when compared with the TIP procedure (5.3% versus 3.8%; $P = .028$), but there was a significantly increased incidence of meatal stenosis following the TIP technique when compared with the Mathieu (3.1% versus 0.7%; $P < .001$). The authors concluded that both of these procedures have low rates of postoperative complications and there is no clear consensus on the best surgical procedure for hypospadias repair.

CONCLUSION

If a Mathieu procedure is chosen, we recommend use of the Y-V glanuloplasty modification with meticulous subcuticular sutures (ie, not as deep as the full thickness of the flap). Based on our results and those of previous studies, we do not recommend a catheterless technique but prefer using the modification with a urethral stent.

Conflict of Interest: none declared.

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Table 1. Postoperative Complications for Patients Receiving Surgery With a Stent and Without a Stent (N = 56).

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Complication	Group 1 Without Stent (n = 30)	Group 2 With Stent (n = 26)
Dysuria	10	3
Urgency		4
Edema of the wound	2	
Secondary bleeding due to wound infection; flap rupture; reoperation	1	

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