How to improve outcome in surgery for Proximal Hypospadias?

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Abstract

Objective: To evaluate the role of subdartos fascial tissue as watertight layer in improving outcome for 2-stage proximal hypospadias surgery.

Methods: The experimental study was conducted at the Department of Urology, Indus Hospital, Karachi, and comprised an audit of patients with proximal hypospadias who underwent surgery from July 1, 2007, to December 31, 2011. The initial two-stage repair of proximal hypospadias led to a high rate of urethrocutanous fistula formation (Group A), and, thus, a modification was introduced and subdartos facial double layer was applied over the urethral suture line (Group B). The results were compared regarding age, type of hypospadias, graft failure and urethrocutanous fistula in these patients.

Results: There were 27 patients in Group A and 16(59.3%) of them ended up having urethrocutanous fistula. Group B had 25 patients and only 2(8%) had fistula formation.

Conclusion: The application of dartos facial flap waterproofing layer reduced fistula rate.

Keywords: Severe hypospadias, Dartos fascial flap, Urethrocutanous fistula. (JPMA 66: 207; 2016)

Introduction

Hypospadias is one of the most common malformations of penile urethra with the incidence of 1 in 250 male newborns.[1] Most children present in their early life because of cosmetic, urinary stream and future fertility issues. Many techniques have been described. Today, the two-stage hypospadias repair is a commonly used technique repair of proximal penile, penoscrotal and scrotal hypospadias with chordee.[2] In the first stage, the penis is straightened, chordee tissue removed and urethral plate is replaced with graft which is prepetiual skin or buccal mucosa.

In the second stage, urethral plate is tabularised. Proximal hypospadias repair has significant morbidity like urethrocutanous fistula, wound dehiscence and meatal stenosis. Application of waterproofing layer was first described in 1973.[3] After the introduction of this waterproofing layer, a number of studies[4-6] published different methods of its application in hypospadias surgeries with low fistula rate.

The current study was planned to evaluate the role of subdartos fascial tissue as watertight layer in improving outcome for two-stage proximal hypospadias surgery.

Patients and Methods

The experimental study was conducted at the Department of Urology, Indus Hospital, Karachi, and comprised an audit of patients with proximal hypospadias who underwent surgery from July 1, 2007, to December 31, 2011.

The initial Bracca's[2] two-stage repair of proximal hypospadias led to initial success but subsequently a high rate of urethrocutanous fistula formation (Group A). All patients in this group had simple tubularisation of urethral plate and skin cover without any intervening tissue layer. This prompted modification of technique which constituted raising a layer of subdartos tissue and applying as double layer over the urethral tube suture line. This acted as a waterproof layer between urethra and skin.

After institutional review board approval, data of subsequent patients undergoing modified repair (Group B) was collected prospectively from January 1, 2012, to December 31, 2013.

We compared age, type of hypospadias, graft failure and urethrocutanous fistula formation between these 2 groups. During this period, patients in Group A with complication of urethrocutanous fistula also underwent reoperation using subdartos fascia as waterproof layer (Group C).

All surgeries were performed by a single surgeon with vast experience in urological surgeries. In terms of the earlier procedure, after successful stage 1 repair, the second stage was undertaken 4-8 months later. The neourethral plate was undermined from sides and tubed over 7-10 Fr feeding tube using a fine, interrupted, 6/0 polydioxanone suture (PDS). Glanuloplasty and

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Figure-1: Inner layer of penile shaft skin on dorsal side is excised by sharp scissor dissection, revealing the deep subcutaneous layer i.e. dartos fascial flap.

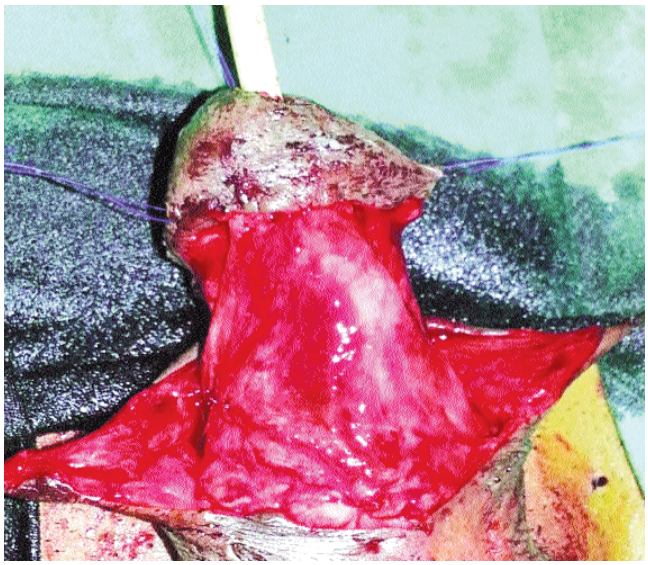

Figure-2: The flap is sutured in place with fine 6/0 Polydioxanone suture (PDS) and wrapped around urethral suture line.

meatoplasty were done and the ventral skin was closed. There was no intervening tissue between skin and suture line. The per-urethral tube and dressing was removed on 6-7th postoperative day.

The modified procedure with dartos fascial flapI was similar except that in the second stage after tubing of the neourethral plate, circumcision incision was made subcoronally. The penile skin wadegloved. Using sharp dissection, dartos fascial layer was separated from the skin (Figure-1). This flap of subcutaneous tissue was divided midline, mobilised and brought around to the ventral surface. The dartos fascial flap was mobilised sufficiently to avoid torsion of penis. The flap was sutured in place with fine 6/0 PDS to completely cover the urethral suture line (Figure-2). Glanulopasty was done and ventral skin was closed as before. The waterproofing layer required 10 to 15 minutes of extra time in operative procedure. Daisy dressing was done and urine bag was attached to the feeding tube which was left on free drainage.

Results

Group A had 27 patients with a mean age of 9.24±4.99 years. Of them, 16(59%) patients had proximal penile and 11(41%) had penoscrotal hypospadias. Of the total, 16 (59%) patients formed a urethrocutanous fistula (Grade IIIb Modified Clavein grade).

Group B had 25 patients with a mean age of 8.6±5.57 years. Among them, 9(36%) patients had proximal penile and 16(64%) had penoscrotal hypospadias. Only 2(8%) patients formed urethrocutanous fistula (Grade IIIb Modified Clavein grade).

Table-1: Group Comparison.

	Group A (Without dartos) n (27)	Group B (With Dartos) n (27)	Group C (Fistula closure with Dartos) n (10)
Age (year ± mean)	9.24 (4.99)	8.6 (5.57)	8.5 (4.51)
Type of Hypospadias			
o Proximal penile	16	9	06
o Penoscrotal	11	16	04
Graft Failure (Grade IIIb)*	1	0	NA
Urethrocutanous fistula (Grade IIIb)*	16 (59.30%)	2 (8%)	3 (30%)

*Modified Clavein Grade System used for surgical complications.

We followed these patients for 1 year during which.

10(37%) patients of Group A were re-operated with the modified technique and were labeled as Group C. Of the 10 patients in Group C, 7(70%) had successful closure of fistula, while 3(30%) had fistula recurrence (Table).

Discussion

Many surgical modifications have been done to reduce the complication in proximal hypospadias repair. The concept of dartos fascial flap initially was described 25 years ago.[3] The importance of waterproofing layer was

once again mentioned by a study that reported a fistula rate of 63% without waterproofing and 4.5% with waterproofing.[7] Another study described a double-layer dartos flap for preventing fistula formation after tubularised incised plate (TIP) urethroplasty.[8] In 29 patients (group 1), a dorsolateral flap was rotated laterally for covering the neourethra and in the remaining 45 patients (group 2) the neourethra was covered with dorsal double dartos flaps. In group 1, fistula in 4 patients and partial glanular dehiscence in 1 patient were detected. There was no fistula formation in group 2.[8]

Another study[9] compared the complication rates of the single-flap and double-flap versus flapless procedure in TIP urethroplasty, and found that covering the neourethra with additional layer had an improvement in terms of avoidance in fistula formation.

A 10-year review[10] of hypospadias surgery by application of waterproofing layer over neourethra reported 5.9% overall fistula rate.

Our technique provided a well-vascularised dorsal dartos flap ventrally over the neourethra and gave waterproofing layer. We had no complication like haematoma or infection. We observed much improved results after application of dartos fascial flap. This dramatic improvement resulted from change in technique.

Conclusion

The application of a watertight layer i.e. dartos facial flap resulted in reduction in the fistula rate from 59.3% to 8%. There was some increase in the operating time, but no extra morbidity. In addition, this type of watertight layer has benefits in hypospadias fistula repair as well.

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