Effect of Double Layer Dartos Flap in Reduction of Fistula Rate Post Hypospadias Repair

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Abstract

Objective: To assess the impact of double layer dartos flap on urethro-cutaneous fistula rate reduction and to compare it with single layer dartos flap in Tubularized Incised Plate Urethroplasty (TIPU) for hypospadias in children.

Methods: Between January 2008 and month 2011 retrospective charts review for 120 patients who had hypospadias repair by the author. 26 patients were excluded from the study because they were not suitable for TIPU procedure. Therefore, our study sample involved 94 children.

Results: Mean age at time of surgery was 16 months (10-96 months), with a mean follow up of 18.2 months (10–36 months). All patients had hypospadias repair by utilizing TIPU. Patients were divided into two groups: Group one involved 50 patients had double layer dartos flap. Group two involved 44 patients had single-layer dartos flap. All patients had stent insertion at the time of repair. 6/44 patients [13.6%] developed fistula in group two and 2/50 patients [4%] in group one had fistula.

Conclusions: Dartos coverage appears to have significant effect in reducing urethro-cutaneous fistula in TIPU repair. With double layer dartos coverage further reduction can be achieved.

Keywords: Hypospadias, Double Layer Dartos Flap, Single Layer Dartos Flap, urethra-cutaneous fistula.

(J Med J 2013; Vol. 47 (4):293- 297)

Received	***Accepted***
June 24, 2012	*Feb. 5, 2013*

Introduction

The incidence of hypospadias among live birth boys is around 0.3% [1,2,3]. Diagnosis is usually made immediately after birth, during examination of the genital area.. Once the diagnosis is established; parents advised not to circumcise the child as the foreskin may be used during his surgical repair, which is usually done at around the age of one year. Many different techniques were utilized for repair of hypospadias. TIPU by Snodgrass was first reported in 1994 [4]. The basic principle of TIPU is to incise urtheral plate in midline and to re-tubularize the urethra and advance the meatus distally into the glans, then to insert a vascularized foreskin flap (dartos flap) after de-epethililizatin of foreskin.

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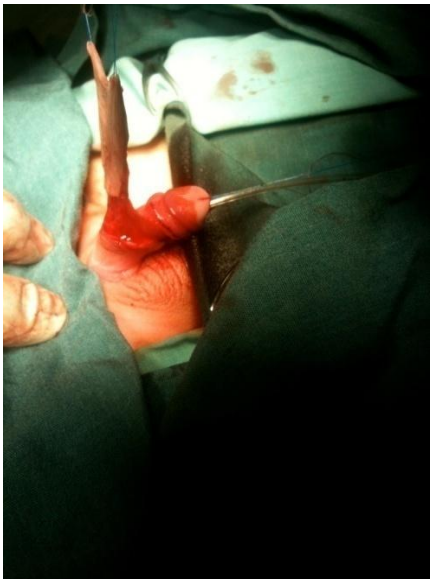

Figure 1

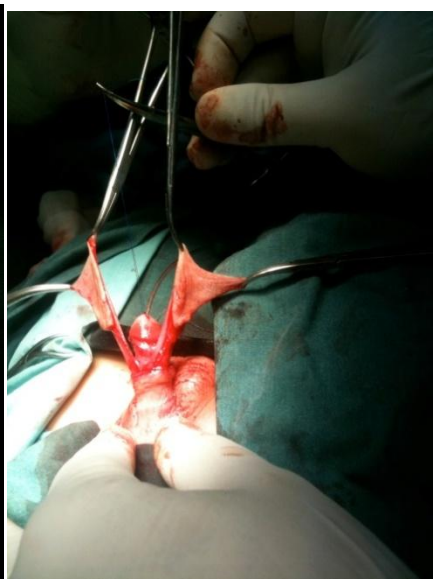

Figure 2

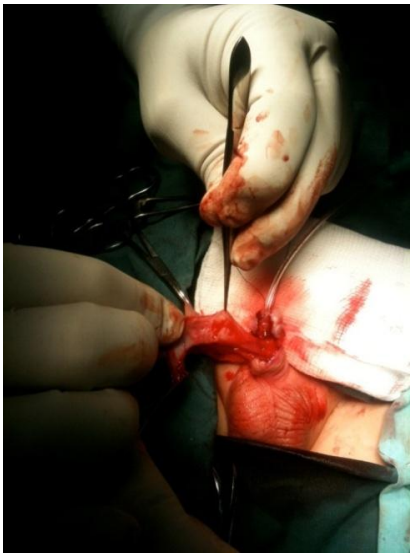

Figure 3

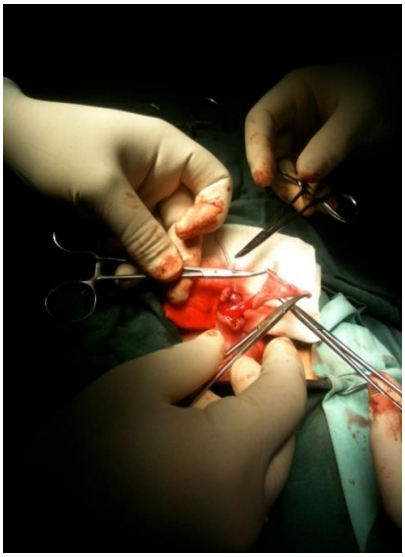

Figure 4

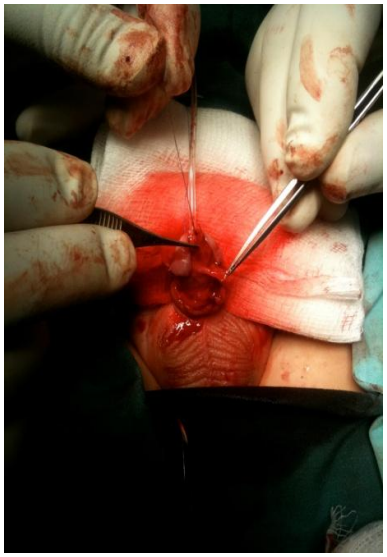

Figure 5

Materials and Methods:

A retrospective charts review of 120 patients who had hypospadias repair, done by a single pediatric urologist, between January 2008 to December 2011. Twenty six patients were excluded from the study because they were not suitable for TIPU procedure. Therefore, our study sample involved 94 patients. They were:62 coronal, 28 distal shaft and 4 midhaft hypospadias. All patients had tubularized incised plate urethroplasty (TIPU) with dartos flap coverage. They were divided into two groups. Group one; 50 patients using double layer dartos flap. While group two; 44

patients using single-layer dartos flap, Table 1.

Table 1: patients' distribution according to type of surgery and preoperative site of urethral meatus

Site of meatus	Group 1*	Group 2**	Total
Cornal	33	29	62
Distal shaft	15	13	28
Mid shaft	2	2	4
Total	50	44	94

* *Double layer dartos flap*

***Single layer dartos flap*

Surgical Procedure:

Same technique was utilized to raise dartos flap in the two groups (Figure 1). In patients with the single layer dartos flap; the flap was rotated anteriorly either from left or right side of the penis and fixed over the neourethra with 6/0 absorbable sutures. In patients with double layers dartos falp; the flaps were rotated anteriorly as bayers flap by dividing the dorsal flap in the midline half (Figure 2) and rotate the two flaps anteriorly from each side of the penis (figure 3, 4). At the end the two flaps were de-epithelialized and fixed over the neourthera in two layers with 6/0 absorbable suture (Figure 5). Patients from the 2 groups had stent insertion at time of repair, discharged on first day post operatively, on oral antibiotic which is stopped the day of stent removal.

Results

Mean age at the time of surgery was 16 months (10-96 months), with a mean follow up of 18.2 months (10-36 months). Of the 50 patients who underwent double layers dartos flap (group 1) 2 patients [4%] developed urethro-cutanous fistula, while 6 of 44 patients [13.6 %] who had single layer dartos flap (group 2) developed fistula .Statistical analysis using T test for two independent portions was done, T=3.33 which is statistically significant at α= 0.01. None of the patients from the 2 groups developed glans dehiscence Table (2, 3).

Table 2: Patients from group 1: Double layers dartos flap repair

Site of meatus	Coronal	Distal shaft	Mid shaft	Total
Number of patients	33	15	2	50
Fistula	1	0	1	2
Glans dehiscence	0	0	0	0

Table 3: Patients from group 2: single layer dartos flap

Site of meatus	Coronal	Distal shaft	Mid shaft	Total
Number of patients	29	13	2	44
Fistula	2	3	1	6
Glans dehiscence	0	0	0	0

Discussion

Over the past 18 years from the evolution of TIPU by nodgrass [4,5]; dartos flap was the most common l modification in reduction fistula rate, as a vascularised healthy layer between penile ventral skin and the neourethral suture line [6,7]. Although the initial experience with TIPU did not highlight the importance of interposing dartos tissue between neourethral suture line and the ventral skin, several subsequent articles stressed the importance of providing a barrier layer to decrease fistula rates [8,12]. some other studies compared dartos flap and tonica vaginalis flap

[9,10,11], which proved that keeping a healthy vascular layer as a barrier will have better out come in regard to fistula rate.

Kamal described a double dorsal dartos flap, which was brought around both sides of the penis to create two-layered dartos coverage, that resulted in reduction of fistula rate [14,15].

Similarly, Bakan and Yildiz noted no fistula in 45 patients who underwent double dartos coverage as compared to a 14% fistula rate in 29 patients who underwent a lateralized dartos flap alone [16,17]. This principle of providing a barrier between the urethral suture line and skin closure is important in hypospadias surgery. some believe that double dartos flap rotated ventrally as Bayers flap will prevent right or left penile rotation [14].

Conclusion: Dartos coverage appears to have a positive effect in reducing fistula rate after TIPU hypospadias repair. With double layer dartos coverage further significant reduction can be achieved.

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استخدام طبقة مزدوجة من السديلة السلخية يقلل من حدوث الناسور الإحليلي بعد إجراء عمليات إصلاح المبال التحتي

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الملخص

الهدف: تعرف أثر وضع طبقة مزدوجة من السديلة السلخية في التقليل من نسبة حدوث الناسور الإحليلي بعد إجراء عمليات إصلاح المبال التحتي مقارنة باستخدام طبقة أحادية من السديلة السلخية.

الطريقة والإجراءات: تمت مراجعة السجلات الطبيةلـ 120 حالة مبال تحتي بين عامي 2008 و2011. أجريت لها عمليات جراحية، واستثني من الدراسة 26 حالة، إما لوجود مبال تحتي داني أو لعدم المتابعة أو لإعادة التداخل جراحيا. واقتصرت الدراسة على 94 حالة.

النتائج: كان متوسط أعمار الحالات التي تم فيها تداخل جراحي 16 شهراً (10–96 شهراً)، وكان متوسط مدة المتابعة السريرية للحالات 18.2 شهر (10– 36 شهر). تم توزيع الحالات إلى مجموعتين: الأولى وتتكون من 50 حالة أجريت باستخدام السديلة السلخية المزدوجة، والثانية تتكون من 44 حالة أجريت باستخدام السديلة السلخية الأحادية، و6 حالات من أصل 44 حالة في المجموعة الثانية تكوّن عندهم ناسور إحليلي مقارنة مع حالتين من أصل 50 حالة في المجموعة الأولى حدث عندهم ناسور إحليلي.

الاستنتاجات: إن استخدام الأنسجة السلخية في عمليات إصلاح المبال التحتي يقلل من نسبة حدوث الناسور الإحليلي، وهذه النسبة أقل بشكل ملحوظ عند استخدام السديلة السلخية المزدوجة.

الكلمات الدالة: المبال التحتي، السديلة السلخية المزدوجة، السديلة السلخية الأحادية، الناسور الإحليلي.