

## Outcome of Urethro Cutaneous Fistula Repair

Iqbal Shahzad<sup>1</sup>, Shahzad Ali<sup>2</sup>, Qazi Fasih-Ud-Din<sup>3</sup>

### ABSTRACT

**Objective:** To evaluate the outcome of urethro cutaneous fistula repair.

**Methodology:** This was a prospective study conducted in department of urology Jinnah Postgraduate Medical Centre (JPMC), Karachi. Seventeen cases with urethrocutaneous fistulas were enrolled in this study. In 12 (75%) we did the simple repair and second layer with dartos, in 03 (16.7%) OIU and silicone catheterization was done, but they recurred then repair with tunica vaginalis cover was performed and 02 (8.3%) patient underwent OIU plus simple repair with dartos.

**Results:** The mean age was  $25.58 \pm 6.2$  years, in 11 post hypospadias was the cause of urethrocutaneous fistula. Recurrence was observed in four patients. Two patients after post hypospadias repair; one after stricture peno-scrotal and one after post infection, boil at base of penis had recurrence. Two patients with simple repair and 2<sup>nd</sup> layer with dartos had recurrence, two patients treated with OIU had recurrence and after that repair with tunica vaginalis cover was performed with no recurrence and none of the patients treated with OIU plus simple repair with dartos had recurrence.

**Conclusions:** Circumferential incision around the fistula opening, tension free closure with fine PDS suture is the key for successful treatment of urethral fistula.

**KEY WORDS:** Urethrocutaneous fistula, Hypospadias.

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### INTRODUCTION

Urethrocutaneous fistula after hypospadias repair remains a frustrating problem for surgeons. Furthermore, with the improvement in suture material and surgical techniques, such complications should now rarely be encountered. Management of these fistulas require a skilled technical as well surgical

approach. The occurrence of urethrocutaneous fistulae precludes a goal of hypospadias surgery,<sup>1</sup> produces mental burden on patient and family.

Unfortunately there is no one single perfect technique to repair an urethrocutaneous fistula. Factors that may affect results of their repair may be the conditions of local tissue, duration after hypospadias repair, the number, location and size of the fistula, patients age, previous surgical attempts, the type of suture material used, the skills of the operating surgeon and proper inversion of the edges and coverage by second layer etc. Some failure rate is expected in every type of repair. By providing a water-tight covering layer, the incidence of recurrence in urethrocutaneous fistula repair can be greatly reduced, especially in large urethrocutaneous fistulas.<sup>2</sup> The aim of the present study was to analyze the influence of the changing surgical principles on the recurrence rate of Urethro-Cutaneous Fistula performed at our institution.

1. Iqbal Shahzad, FCPS,
  2. Shahzad Ali, FCPS,
  3. Qazi Fasihuddin, FRCS,
- 1-3: Department of Urology,  
Jinnah Postgraduate Medical Centre,  
Karachi, Pakistan.

#### Correspondence

Iqbal Shahzad,  
FF3-23/B Seaview Township Defence Phase 5 Ext,  
Karachi, Pakistan.  
E-mail: iqbalshahzaduro\_surg@yahoo.com

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## METHODOLOGY

This study was conducted in Department of Urology, JPMC, Karachi from July 2008 to Dec 2010. We have operated on a total number of 17 cases with urethrocutaneous fistulas. All the patients underwent routine preoperative history, examination and investigations. Out of the 17 fistula cases, four were recurrence after its first surgical attempt, two were repaired using routine method and in other two OIU and catheterization was done with an intent that relieving distal obstruction could result in healing of fistulous tract and 13 cases were primarily successful. They were classified according to location into sub-coronal eight, mid-penile in four and proximal-penile in five, and according to the size into two groups either less than 5mm in 10 and more than 5 mm in seven. All the patients were covered with a vascularised dartos-based flap [flip flap]. If a patient had more than one small fistula adjacent to each other, they were fused to a large single fistula and then repaired.

In this study, coronal and the mid-penile fistula, were treated with circumferential incision bigger than the size of the fistula with 2mm on each side as a relaxing incision followed by covering the suture line with dartos flip flap after water-tight closure and finally the proximal hypospadias treated as the mid penile, except that we covered it with tunica vaginalis. In all patients silicon catheter or a feeding tube was kept as a stent for 10 to 12 days duration postoperatively.

**Surgical technique:** The first step after general anaesthesia and painting of the patients is to determine the actual size and number of the fistulas. We had two patients each with two fistulas in close proximity or adjacent to each other. Then they were converted into a single large fistula. Infiltration of Xylocaine subcutaneously using a needle of 27 gauges around the fistula edges made undermining of the fistula easy. Second step is to incise the mid-line penile skin in circumferential manner around fistula with a small knife

Third step is the dissection around the circumferential incision which includes meticulous freeing of urethra from the surrounding skin then the patient was catheterized with a catheter or feeding tube usually a 16fr size as stent and urinary drainage. The forth step is the fistula closure - done using 6-0 Vicryl suture or 6-0 PDS on a non-cutting needle in a continuous manner.

Second layer coverage was provided with dartos flip flap, which was harvested in cases of the coronal and mid penile fistula in length to breadth ratio

of 1/3 after skin degloving and we selected the tunica vaginalis for the proximal types; those were sutured over the urethrocutaneous fistulae in a water tight fashion with interrupted Vicryl 5-0.

Finally the penile skin was closed over the flap and sterile dressing was applied. The urethral catheter/stent was removed after 10 days and the dressing was changed under all aseptic measures on 5<sup>th</sup> post-operative day or if it becomes soaked. Erection prohibition was made mandatory in every patient post-operatively at least for two weeks.

## RESULTS

Total number of patients were 17. Minimum age was 17 years while maximum age was 34 years. The mean age of the patients was  $25.58 \pm 6.2$  years, in majority of cases (11 cases) post hypospadias was the cause of urethrocutaneous fistula. In 12 patients the site of fistula was ventral surface of shaft and 13 patients had single fistula (Table-I).

On pre-operative evaluation by urethrogram we observed that 11 patients had leaking fistula with proximal visualization of contrast, two had leakage

Table-I: Pre & post operative analysis.

		Frequency	Percent
Cause of urethrocutaneous fistula	Post hypospadias	11	64.7%
	Stricture peno-scrotal	4	23.5%
	Post infection, boil at base of penis	2	11.8%
Site of fistula	Peno-scrotal fistula	5	29.4%
	Ventral surface of shaft	12	70.6%
Number of fistula	Single	13	76.5%
	Two	04	23.5%
Pre-operative evaluation	Urethrogram showing leakage from fistula site with outlined proximal urethra	10	64.7%
	Urethrogram showing penile stricture urethra	05	29.4%
	Urethrogram showing leakage with no opacification of bulbourethra	02	5.9%
	Procedure		
	Simple repair 2nd layer with dartos		
	OIU, recurrence then repair and tunica vaginalis cover.	03	17.6%
Suture material	OIU + simple repair with dartos	02	11.8%
	PDS 6/0	13	76.5%
Stent	Vicryl 5/0	04	23.5%
	Feeding tube	12	70.6%
Recurrence	Silicone	05	29.4%
	Yes	04	23.5%
	No	13	76.5%

with non visualization of bulbous urethra and five patients had penile stricture urethra.

In majority of patients (12 cases) we did the simple repair and second layer with dartos, in three cases OIU and silicone catheterization was done, but they recurred then repair with tunica vaginalis coverage was performed and two patients underwent OIU plus simple repair with dartos (Table-II). In majority of the patients (13 cases) suture material used was PDS 6/0 as compared to this in only four patients population vicryl 5/0 was used.

Frequency of recurrence was observed in four patients. Two patients after post hypospadias repair, one patient each after stricture peno-scrotal and post infection, boil at base of penis had recurrence. Out of the twelve patients with simple repair and 2<sup>nd</sup> layer with dartos, two had recurrence and out of three patients treated with OIU and catheterization two had recurrence and after that simple repair and 2<sup>nd</sup> layer coverage with tunica vaginalis was performed with no further recurrence and none of the patients treated with OIU plus simple repair with dartos had recurrence (Table-II).

## DISCUSSION

The fistula formation after hypospadias repair continues to be a frustrating problem, thus surgeons have re-evaluated their techniques, as well as tried to explore the underlying causes that may put the patients at risk of a postoperative fistula.<sup>2</sup>

In this study majority of patients had single fistula (13/17), on ventral surface (12/17) and most of the patients had fistula after hypospadias repair (11/17). In majority of our study population we repaired the fistula with simple repair and 2<sup>nd</sup> layer with dartos (12/17). Recurrence was observed in four cases, out of 17 cases repaired for urethrocutaneous fistula.

Secrest et al<sup>3</sup> reported on the successful urethrocutaneous fistula repair in 53 (91.4%) of the total 58 patients after hypospadias repair. The investigators emphasized the use of magnification. From a technical standpoint, we do not believe that the use of loupe magnification repair will give any advantage over routine repair.

Richter et al<sup>4</sup> preferred converting coronal fistulas into coronal hypospadias, followed by tubularisation of the urethral plate with or without a dorsal mid-line relaxing incision.<sup>5</sup> The Thiersch tube repair with or without the relaxing urethral plate incision, as described by Reddy,<sup>6</sup> Rich et al<sup>7</sup> and Snodgrass,<sup>8</sup> had a success rate of 92%. As with hypospadias surgery, there are no perfect techniques for repairing urethrocutaneous fistulae. Many variables could influence the surgical management and outcome, the time of occurrence after urethroplasty, the location (glanular, coronal, mid-shaft, etc.), size (pin-point, large), the number and the conditions of local tissue.<sup>9</sup> We selected all our patients six months, after initial failed surgical intervention / after having used

Table-II: Recurrence analysis.

		Recurrence		p value
		Yes	No	
Cause of urethrocutaneous fistula	Post hypospadias	2 (18.2%)	9 (81.8%)	0.151
	Stricture peno-scrotal	1 (25%)	3 (75%)	
Site of fistula	Post infection, boil at base of penis	1 (50%)	1 (50%)	1.000
	Peno-scrotal fistula	2 (40%)	3 (60%)	
	Ventral surface of shaft	2 (16.7%)	10 (76.9%)	
Number of fistula	Single	3 (23.1%)	10 (70%)	0.371
	Two	1 (25%)	3 (75%)	
Pre-operative evaluation	Urethrogram showing leakage from fistula site with visualization of proximal urethra	2 (18.2%)	9 (81.8%)	0.157
	Urethrogram showing penile stricture urethra	1 (20%)	4 (80%)	
	Urethrogram showing leakage with no opacification of bulbous urethra	1 (100%)	0	
Procedure	Simple repair 2 <sup>nd</sup> layer with dartos	2 (16.7%)	10 (83.3%)	0.027
	OIU, recurrence then repair and tunica vaginalis cover.	2 (66.7%)	1 (33.3%)	
Suture material	OIU + simple repair with dartos	0	2 (100%)	0.054
	PDS 6/0	2 (15.4%)	11 (84.6%)	
Stent	Vicryl 5/0	2 (50%)	2 (50%)	0.054
	Feeding tube	1 (8.3%)	11 (91.7%)	
	Silicone	3 (60%)	2 (40%)	

conservative methods. We prefer to cover the coronal fistula with circumferential incision as a relaxing incision with success rate 88.2% [15/17].

A common error was observed is timing of fistula repair. Consensus and logic in this regard dictates a wait and see policy for at least six months of last repair to enable the scars to mature and also the oedema and indurations to subside.<sup>1</sup> During the last decade many principles of an ideal repairing technique have been clarified. Delicate tissue handling, inversion of the urethral mucosa after excising the epithelialised tract of the fistula, a multilayer repair with well-vascularised tissues, avoiding overlapping sutures and nonabsorbable or thick suture materials, a tension-free closure, use of optical magnification and needle-point cautery for coagulation are currently considered mandatory.<sup>10</sup>

We advise the use of bipolar diathermy for meticulous dissection and non bloody field, infiltration of xylocaine and perfect subcuticular tissue closure with 5/0 vicryl. Various methods and techniques have been reported in the literature for the management of these urethrocutaneous fistulae with variable results. Larger the size of these fistulae more difficult is their closure and correction.<sup>11</sup> We had no difference between both patients groups regarding its size. Larger the size the more difficult closure it is due to the presence of tension thus we avoid this problem by making the midline incision for all large fistulas as a relaxing incision to avoid tension sutures and ischemia.

Some authors advised the use of purse string sutures as a simple method to close fistula. This may be of value in small sized fistulas but when the larger is the fistula the more tension will result. We disagree with this approach as this principle carries the risk of tension and ischemia at the edge of the fistula opening.<sup>12</sup> Sub-cuticular continuous sutures had the benefits for preventing the leakage of the urine and passing the urethral epithelium through the sutures.<sup>13</sup> Numerous techniques have been devised to counteract this problem of post-operative recurrence or leakage and pursuit for an ideal one is still going on. Among these techniques, the most common maneuver is to place some intervening layer of tissue between neo-urethra and the skin.<sup>14</sup>

Some authors have advised the use of (Tunica vaginalis or scrotal dartos layer) for recurrent fistulas, tissues from an unscarred area and also intervening fibrin glue, but we performed same for both types either the primary or the recurrent types. We selected the penile dartos flap as a random flap with a length to breadth ratio 1/2 to 1/ 3 [flip flap] with

good results for fistula repair with success rate more than 96%. The dartos flap is fibro-adipose tissue that may reach the distal penile shaft without tension. Dartos flaps have been used for both the primary waterproofing of hypospadias repair and fistula repair.<sup>14</sup> We selected the Tunica vaginalis for the proximal fistula types. This layer was considered waterproofing layer between urethra and skin and well vascularised. Furthermore we did not consider its indication for all other types of fistula repair to avoid testicular complications and also as long flap would be required which would be endangered by vascular ischemia. We considered it the best choice after dartos flaps.

## CONCLUSIONS

Circumferential incision around the fistula opening after confirming urethral patency, tension free water tight closure with the dartos flip flap and use of fine suture material is the key for successful treatment of urethral fistula.

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