Original Article

Outcome of Urethro Cutaneous Fistula Repair

Iqbal Shahzad¹, Shahzad Ali², Qazi Fasih-Ud-Din³

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 urethrococutaneous 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 ± 6.2 years, in 11 post hypospadiasis was the cause of urethrococutaneous 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 2nd 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: Urethrococutaneous fistula, Hypospadias.

INTRODUCTION

Urethrococutaneous 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 urethrococutaneous fistulae precludes a goal of hypospadias surgery,¹ produces mental burden on patient and family.

Unfortunately there is no one single perfect technique to repair an urethrococutaneous 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 urethrococutaneous fistula repair can be greatly reduced, especially in large urethrococutaneous fistulas.² 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.
Urethro Cutaneous Fistula Repair

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 anesthesia 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 midline 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 urethrocistaneous 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 5th 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 ± 6.2 years, in majority of cases (11 cases) post hypospadiasis was the cause of ure throcutaneous 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.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause of urethrocutaneous fistula</td>
<td>Post hypospadiasis 11 64.7%</td>
</tr>
<tr>
<td>Site of fistula</td>
<td>Peno-scrotal fistula 5 29.4%</td>
</tr>
<tr>
<td></td>
<td>Ventral surface of shaft 12 70.6%</td>
</tr>
<tr>
<td>Number of fistula</td>
<td>Single 13 76.5%</td>
</tr>
<tr>
<td></td>
<td>Two 04 23.5%</td>
</tr>
<tr>
<td>Pre-operative evaluation</td>
<td>Urethrogram showing leakage from fistula site 10 64.7%</td>
</tr>
<tr>
<td></td>
<td>with outlined proximal urethra</td>
</tr>
<tr>
<td></td>
<td>Urethrogram showing penile stricture urethra 05 29.4%</td>
</tr>
<tr>
<td></td>
<td>Uretherogram 02 5.9%</td>
</tr>
<tr>
<td></td>
<td>showing leakage with no opacification of bulbour urethra 12 70.6%</td>
</tr>
<tr>
<td></td>
<td>Procedure Simple repair 2nd layer with dartos OIU, recurrence 03 17.6%</td>
</tr>
<tr>
<td></td>
<td>then repair and tunica vaginalis cover</td>
</tr>
<tr>
<td>Suture material</td>
<td>PDS 6/0 13 76.5%</td>
</tr>
<tr>
<td></td>
<td>Vicryl 5/0 04 23.5%</td>
</tr>
<tr>
<td>Stent</td>
<td>Feeding tube 12 70.6%</td>
</tr>
<tr>
<td></td>
<td>Silicone 05 29.4%</td>
</tr>
<tr>
<td>Recurrence</td>
<td>Yes 04 23.5%</td>
</tr>
<tr>
<td></td>
<td>No 13 76.5%</td>
</tr>
</tbody>
</table>
with non visualization of bulbous uretha 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 2nd 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 2nd 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.²

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

Secrest et al³ 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 al⁴ preferred converting coronal fistulas into coronal hypospadias, followed by tubularisation of the urethral plate with or without a dorsal midline relaxing incision.⁵ The Thiersch tube repair with or without the relaxing urethral plate incision, as described by Reddy, Rich et al⁶ and Snodgrass,⁷ 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.⁹

We selected all our patients six months, after initial failed surgical intervention / after having used

### Table-II: Recurrence analysis.

<table>
<thead>
<tr>
<th>Cause of urethrocutaneous fistula</th>
<th>Recurrence</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post hypospadiasis</td>
<td>Yes: 2 (18.2%)</td>
<td>No: 9 (81.8%)</td>
</tr>
<tr>
<td>Stricture peno-scrotal</td>
<td>Yes: 1 (25%)</td>
<td>No: 3 (75%)</td>
</tr>
<tr>
<td>Post infection, boil at base of penis</td>
<td>Yes: 1 (50%)</td>
<td>No: 1 (50%)</td>
</tr>
<tr>
<td>Number of fistula</td>
<td>Single: 3 (23.1%)</td>
<td>No: 10 (76.9%)</td>
</tr>
<tr>
<td>Number of fistula</td>
<td>Two: 2 (25%)</td>
<td>No: 3 (75%)</td>
</tr>
<tr>
<td>Pre-operative evaluation</td>
<td>Urethrogram showing leakage from fistula site with visualization of proximal urethra</td>
<td>Yes: 2 (18.2%)</td>
</tr>
<tr>
<td>Procedure</td>
<td>Urethrogram showing penile stricture urethra</td>
<td>Yes: 1 (20%)</td>
</tr>
<tr>
<td>Procedure</td>
<td>Urethrogram showing leakage with no opacification of bulbous urethra</td>
<td>Yes: 1 (100%)</td>
</tr>
<tr>
<td>Procedure</td>
<td>Simple repair 2nd layer with dartos</td>
<td>Yes: 2 (16.7%)</td>
</tr>
<tr>
<td>Procedure</td>
<td>OIU, recurrence then repair and tunica vaginalis cover.</td>
<td>Yes: 2 (66.7%)</td>
</tr>
<tr>
<td>Procedure</td>
<td>OIU + simple repair with datos</td>
<td>Yes: 0</td>
</tr>
<tr>
<td>Suture material</td>
<td>PDS 6/0</td>
<td>Yes: 2 (15.4%)</td>
</tr>
<tr>
<td>Suture material</td>
<td>Vicryl 5/0</td>
<td>Yes: 2 (50%)</td>
</tr>
<tr>
<td>Stent</td>
<td>Feeding tube</td>
<td>Yes: 1 (8.3%)</td>
</tr>
<tr>
<td>Stent</td>
<td>Silicone</td>
<td>Yes: 3 (60%)</td>
</tr>
</tbody>
</table>
conservative methods. We prefer to cover the coro-
nal 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 re-
pair to enable the scars to mature and also the oedema
and indurations to subside.1 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 ten-
sion-free closure, use of optical magnification and
needle-point cauterity for coagulation are currently
considered mandatory.10

We advise the use of bipolar diathermy for me-
ticulos 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 manage-
ment of these urethrocutaneous fistulae with vari-
able results. Larger the size of these fistulae more
difficult is their closure and correction.11 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.12 Sub-cuticular continuous sutures had the
benefits for preventing the leakage of the urine and
passing the urethral epithelium through the sutures.13
Numerous techniques have been devised to counter-
act this problem of post-operative recurrence or
leakage and pursue for an ideal one is still going on.
Among these techniques, the most common maneu-
ver is to place some intervening layer of tissue
between neo-urethra and the skin.14

Some authors have advised the use of (Tunica
vaginalis or scrotal dartos layer) for recurrent fistu-
las, tissues from an unscarred area and also inter-
vening 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 re-
pair.14 We selected the Tunica vaginalis for the prox-
imal fistula types. This layer was considered water-
proofing 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 vascu-
lar 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.

REFERENCES

2. Dennis MA, Walker RD 3rd. The repair of urethral fistulas oc-
4. Richter F, Pinto PA, Stock JA, Hanna MK. Management of re-
5. Awad MS. Urethral advancement technique for repair of distal
7. Rich MA, Keating MA, Snyder HM, Duckett JW. Hinging the
8. Snodgrass W. Tubularized, incised plate urethroplasty for distal
9. Retik AB, Keating M, Mandell J. Complications of hypospadias
10. Shanberg AM, Sanderson K, Duel B. Re-operative hypospadias
11. Oswald J, Korner I, Riccabona M. Comparison of perimeatal-
based flap (Mathieu) and the tabularized incised-plate urethro-
plasty (Snodgrass) in primary distal hypospadias. BJU Int 2000;85:725-7.
12. Fatah MF. A method of closing urethral fistulae using a purse-
14. Djordjevic ML, Perovic SV, Vukadinovic VM. Dorsal dartos flap