Urethroplasty by midline longitudinal incision of the dorsal wall of urethra at the site of the fistula: A useful adjunct to the conventional method of repair of urethrocutaneous fistula developing after hypospadias surgery

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ABSTRACT

In cases of repair of urethrocutaneous fistulae developing after primary hypospadias surgery, tubularisation often becomes difficult after excision of scar tissue. It is also well-known that this type of fistulae has a high recurrence rate. In this study of 15 cases, the aim is to analyze the results of conventional urethrocutaneous fistula repair, augmented with the principle of Midline longitudinal incision of the dorsal wall of the urethra at the site of the fistula according to the concept of Tubularised Incised Plate Procedure with the hope of preventing recurrence. Here, the excision of scar tissue around the urethrocutaneous fistulae, tubularisation of urethra is done after incising the dorsal urethral plate. Then the mucosa is closed over a 6F/8F catheter and the resultant suture line is covered first with the dartos flap or adjacent tissue and then, the skin. The skin layer is minimally rotated so as to avoid suture-line overlap. Results of this method has been found to be quite satisfactory, as only in two[1] patients the fistula recurred. Thus it may be concluded from this study that the Tubularised Incised Plate Urethroplasty along with conventional urethral fistula repair is a good adjucntive procedure in prevention of their recurrence.

KEY WORDS: Hypospadias, repair, urethrococutaneous fistula

Urethrococutaneous fistula is a common complication of hypospadias repair with reported incidence being 10-20%. Fistula repair procedures have a high recurrence rate quoted to be as high as 29% in the literature.[11] In the conventional method of repair of urethrococutaneous fistulae, firstly the peri-fistula scar tissue is excised. Then, three layers of tissue are mobilized:

a. margins of urethrococutaneous fistula
b. dartos/surrounding tissue
c. skin.

Finally, these three layers are apposed with or without double-breasting of skin.

Causes of recurrence after repair may be summarized as:
1. Dearth of adequate blood supply to the covering flap.
2. Tension in apposition of tissue margins, either due to shortage of available local tissue or inadequate mobilization, or postoperative oedema.
3. Persistent distal obstruction.

In the present method, midline longitudinal incision of the dorsal wall of the urethra at the site of the fistula, according to the concept of tubularized incised plate method, the tissue tension is minimized by the midline urethral plate incision. The advantage of this procedure is that it helps in adequate and proper apposition of tissue layers.

MATERIALS AND METHODS

The present series consists of 15 cases in total, studied between July 2002 and June 2004 with age range 2-11 years (mean: 6.5 years). All these cases developed secondary urethrococutaneous fistulae after primary hypospadias surgery. The sites of the fistulae are proximal penile-4, mid-penile-7, distal penile-4 [Table 1].

Out of the 15 cases, seven[1] were follow-up cases of our own department, whereas the rest were referred from other institutions in Kolkata.

Records of previous operations were available in 10 cases...
only. Mathieu urethroplasty had been performed in two cases, Duckett onlay flap done in six cases and the rest two cases had undergone Snodgrass urethroplasty [Table 2].

The method of urethroplasty followed in this series are:

- **Step 1**: Dorsal urethral plate was exposed by excision of peri fistula scar tissue.
- **Step 2**: The urethral plate was incised in the Midline [Figure 2].
- **Step 3**: Urethral mucosa surrounding the fistula was mobilized and tabularized over a 6F/8F catheter. The suture material used was a delayed absorbable one.
- **Step 4**: The coverings over the tube were made with: first dartos and then skin.
- **Step 5**: The skin was rotated by 10 degrees (approximately) in order to avoid suture line overlap [Figure 3].

### RESULTS

Period of follow-up: 2 months to 2 years (average: 13 months).

Out of the total of 15 cases, 13 showed no recurrence of urethral cutaneous fistula. Only 2 developed fistula at the same site again.

### DISCUSSION

It has been widely reported and accepted that the repair of hypospadias and chordee must be individualized and tailored to each patient. For this reason, there is continual introduction of new procedures and modifications of the ‘accepted’ methods in an attempt to further reduce the various difficulties encountered in hypospadias repair and to achieve a good cosmetic configuration. As a part of this process, tubularized incised plate urethroplasty was first introduced by Snodgrass for repair of distal hypospadias in 1993.\(^1\) Now its application has been extended to more proximal forms of hypospadias.\(^2\) The advantage of this procedure is the provision of a generously mobile plate for tubularization without the use of supplemental flaps and also the creation of a functional neo-urethra with a vertical, slit-like meatus.

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**Table 1**: The sites of the urethral cutaneous fistulae of the cases in the present series

<table>
<thead>
<tr>
<th>Site of fistula</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximal penile</td>
<td>4</td>
<td>26.06</td>
</tr>
<tr>
<td>Mid-penile (Figure 1)</td>
<td>7</td>
<td>46.06</td>
</tr>
<tr>
<td>Distal penile</td>
<td>2</td>
<td>26.06</td>
</tr>
</tbody>
</table>

**Table 2**: The procedures of urethroplasty resorted to the previous cases of the present series

<table>
<thead>
<tr>
<th>Previous procedures</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathieu urethroplasty</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Duckett onlay flap</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Snodgrass urethroplasty</td>
<td>2</td>
<td>20</td>
</tr>
</tbody>
</table>
The technique had been presented as an alternative to meatal-based and onlay island flap procedures for hypospadias repair, but it was not initially considered a viable alternative for a secondary procedure. With the refinement of surgical techniques during the last decade, most paediatric hypospadias repairs can now be performed with minimal morbidity.

Secondary procedures to correct complications remain challenging, especially for those patients who have had a complication from a previous penile surgery, resulting in shortage of local skin for a local flap procedure. Free graft substances, such as extragenital skin and bladder mucosa have been used previously to create a neo-urethra. Significant complications such as excessive stricture formation, graft shrinkage and unsightly scarification of the donor site have been reported in larger follow-up studies of extra-genital skin grafts. The bladder mucosa graft tends to prolapse in an exfoliative fashion, causing splaying of the stream and stenosis of the meatus. Buccal mucosa has been used for urethral reconstruction in recent years with promising early results, but extended follow-up studies are needed to confirm its success in the long run. On this background, during the last two years, a method of urethroplasty, based on the tubularised incised plate procedure, in which a midline longitudinal incision of the dorsal wall of the urethra at the site of the fistula was made, has been used at our institution to repair urethral cutaneous fistulae resulting from hypospadias surgery. Out of the 15 cases treated, 13 did well with complete correction of the previous complications. Recurrence rate was low (13.33%) considering the complex clinical situation.

Although our follow up period is short, we believe that this method based on tubularized incised plate urethroplasty procedure may turn out to be a good alternative, especially in complex secondary urethral cutaneous fistula repair where there is dearth of adequate local penile and prepuceal tissue for repairing the neo-urethra.

REFERENCES