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Hong Kong Urological Association
Urethroplasty Workshop
Division of Urology – Tuen Mun Hospital
Hong Kong
February 9 - 10, 2009
Penile and bulbar urethroplasty
Surgical techniques and results
Basically, the surgical technique for the repair of penile urethral strictures is selected according to stricture etiology.
Etiology of penile urethral strictures

- Failed hypospadias repair
- Lichen sclerosus
- Trauma
- Instrumentation
- Catheter
- Infection
- Other cause
In penile urethral strictures due to:

- Trauma
- Instrumentation
- Catheter
- Infection
- Other cause

The penis is normal: one-stage repair
In penile urethral strictures due to:

- Failed hypospadias repair
- Lichen sclerosus

The penis is abnormal: two-stage repair
One-stage penile urethroplasty

Flap or graft?
One-stage flap urethroplasty
Dartos fascial flap with skin island
Jordan’s flap

Penile urethral stricture involving external urinary meatus
Jordan’s flap
Jordan’s flap
Jordan’s flap
Jordan’s flap
Orandi’s flap

Penile urethral stricture in the middle tract of the shaft
Orandi’s flap
Orandi’s flap

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Orandi’s flap
Orandi’s flap
Orandi’s flap
Orandi’s flap
Asopa’s graft

Penile urethral stricture involving external urinary meatus or in the middle tract of the shaft
Asopa’s graft
Asopa’s graft
Asopa’s graft
Asopa’s graft
Asopa’s graft
Complications following one-stage flap or graft penile urethroplasty

- penile hematoma
- skin necrosis
- fistula
- penile-glans torsion
- sacculation
- meatal stenosis
One-stage penile flap or graft urethroplasty

<table>
<thead>
<tr>
<th>patients</th>
<th>type of repair</th>
<th>success</th>
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<tbody>
<tr>
<td>18</td>
<td>flap</td>
<td>66.7%</td>
</tr>
<tr>
<td>22</td>
<td>oral graft</td>
<td>81.8%</td>
</tr>
<tr>
<td>23</td>
<td>skin graft</td>
<td>78.3%</td>
</tr>
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Barbagli G. et al, BJU Int 2008
Basically, the choice between flap or graft one-stage urethroplasty should be made according to the status of the urethral plate and according to the surgeon’s background, training and preference.
Two-stage urethroplasty using oral mucosal graft

Penile urethral stricture in patient with failed hypospadias repair or lichen sclerosus
First stage
Complications following the first stage of urethroplasty

10-39% of patients showed scarring of the initial graft, requiring new grafting procedures

Barbagli et al., Eur Urol, 2006
Second stage
Second stage
Complications following the second stage of urethroplasty

30% of patients showed complications following the second stage of urethroplasty, requiring surgical revision

Barbagli et al., Eur Urol, 2006
Conclusions

Two-stage penile urethroplasty using oral graft is not a simple procedure and requires great expertise to avoid a lot of traps.

Moreover, this two-stage procedure, also in the hands of the skilled surgeon, showed a high complication rate, either following the first stage or the second stage.
Basically, the surgical technique for the repair of bulbar urethral strictures is selected according to the stricture length.
Which type of urethroplasty?

1 - 2 cm: end-to-end anastomosis

2 – 4 cm: augmented anastomotic repair

> 4 cm: substitution urethroplasty

Stricture associated with local adverse conditions: two-stage urethroplasty
Preparation of the patient

Simple lithotomy position
Preparation of the patient

Allen stirrups with sequential inflatable compression sleeves
1 - 2 cm bulbar urethral stricture

End-to-end anastomosis
Methylene blue is injected into the urethra.
The distal extent of the stenosis is identified by inserting a 16-French catheter with a soft round tip.
The urethra is freed from the bulbocavernous muscle.
The urethra is dissected from the corpora cavernosa.
The distal extent of the stenosis is identified and outlined.
The urethra is transected at the stricture level
The stricture is removed

distal end

proximal end

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A total of 10 interrupted 4-zero polyglactin sutures are put in place before tying.

The urethra is spatuled for 1 cm on both ends.
The anastomosis is completed on the roof
A Foley 16-French grooved silicone catheter is inserted and the urethra is closed
The anastomosis is completed
Results on 176 patients who underwent end-to-end anastomosis
Mean follow-up 75 months (12 – 273 months)

- **success**: 155 (88.1%)
- **failure**: 21 (11.9%)

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2 - 4 cm bulbar urethral stricture

Augmented anastomotic repair using oral graft
Two surgical teams work simultaneously
Two sets of surgical instruments

Oral mucosa

Urethroplasty
Appropriate mouth retractor

Only one assistant is needed to harvest the oral graft
Methylene blue is injected into the urethra.
The distal extent of the stenosis is identified by inserting a 16-French catheter with a soft round tip.
The distal extent of the stenosis is identified and outlined.
The urethra is dissected from the corpora cavernosa
The urethra is transected at the stricture level
The distal and proximal urethral ends are mobilized from the corpora cavernosa.
The distal and proximal urethral ends are fully spatulated along the dorsal surface.
Two ml of fibrin glue are injected over the urethra.
The buccal mucosal graft is applied over the fibrin glue
The distal and proximal urethral edges are sutured to the apices of the graft
The distal urethra is pulled down and the proximal urethra is pulled up to cover the graft.
The distal and proximal urethral edges are sutured together along the midline as an end-to-end anastomosis.
Two ml of fibrin glue are injected over the urethra to prevent urinary leakage.
Results on 24 patients who underwent augmented anastomotic repair using dorsal oral mucosal graft

Mean follow-up 48 months (25 – 78 months)

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<tbody>
<tr>
<td><strong>success</strong></td>
<td>19 (79.2%)</td>
</tr>
<tr>
<td><strong>failure</strong></td>
<td>5 (20.8%)</td>
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</tbody>
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> 4 cm bulbar urethral stricture

Substitution urethroplasty
Substitution urethroplasty

ventral
dorsal
Ventral onlay graft urethroplasty
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Results on 143 patients who underwent ventral oral mucosal onlay graft urethroplasty

Mean follow-up 38 months (12-103 months)

<table>
<thead>
<tr>
<th>Success</th>
<th>126 (88.1%)</th>
</tr>
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<tbody>
<tr>
<td>Failure</td>
<td>17 (11.9%)</td>
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Dorsal onlay graft urethroplasty
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Results on 19 patients who underwent dorsal oral mucosal onlay graft urethroplasty

Mean follow-up 52 months (12 – 117 months)

- **Success**: 14 (73.7%)
- **Failure**: 5 (26.3%)

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One-sided Anterior Urethroplasty: A New Dorsal Onlay Graft Technique

S. B. Kulkarni and G. Barbagli
Results on 24 patients who underwent one-sided anterior urethroplasty

Mean follow-up 22 months (12 – 55 months)

- **success**: 22 (91.6%)
- **failure**: 2 (8.4%)

BJU Int, 2009, in press
Bulbar urethral stricture associated with local adverse conditions

Two-stage urethroplasty
Local adverse conditions

Previous failed open urethroplasty
Local adverse conditions

Fistulas and abscess
Local adverse conditions

Panurethral stricture associated with lichen sclerosus
Local adverse conditions

Urethral stent
Local adverse conditions

Urethral carcinoma
First stage
Webster’s technique
Webster’s technique
Second stage
Results on 55 patients who underwent two-stage urethroplasty

Mean follow-up 66 months (12-198 months)

- **Success**: 34 (61.8%)
- **Failure**: 21 (38.2%)

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Conclusions

- Reconstructive surgery for urethral strictures is continually evolving and the superiority of one approach over another is not yet clearly defined.

- The reconstructive urethral surgeon must be fully able in the use of different surgical techniques to deal with any condition of the urethra at the time of surgery.
Scientific Session at the 2009 American Urological Association

(AUA) Annual Convention

Chicago, Illinois, USA

April 25-30, 2009
Topics to be presented and discussed

Failed Hypospadias Repair Presenting in Adults: A New Outbreak?

Point-Counterpoint. Bulbar Urethroplasty: Transect or Not Transect the Urethra?

Does Penile Length Affect Surgical Steps and Outcome of Posterior Urethroplasty?
Next month, this lecture will be fully available on our website

Thank you!