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Portuguese Andrological Association National Meeting

June 21 - 23, 2008

Oporto - Portugal
Urethral Reconstructive Surgery: Current Trends
Anatomy of the male urethra

- *penile*
- *bulbar*
- *posterior*
Penile urethroplasty

One-stage or two-stage repair?
Penile urethroplasty

The surgical technique for the repair of penile urethral strictures is selected according to stricture etiology.
Etiology of penile urethral strictures in 404 patients

- Failed hypospadias repair 40%
- Lichen sclerosus 40%
- Trauma
- Instrumentation
- Catheter
- Infection
- Other causes

Barbagli 2006, unpublished data
In patients with penile urethral strictures due to:

- trauma
- instrumentation
- catheter
- infection

the penis is normal
Penis is normal: one-stage repair

glans
penile skin
dartos fascia
corpus spongiosum

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In patients with penile urethral strictures due to:

- failed hypospadias
- lichen sclerosus

the penis is abnormal
Penis is abnormal: two-stage repair

Glans and penile skin are fully involved in the disease

Corpus spongiosum and dartos fascia are fully involved in the disease
One-stage penile urethroplasty

Flap or graft?

Flap or graft?

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One-stage flap urethroplasty

ORANDI

JORDAN

McANINCH

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Jordan’s flap
Jordan’s flap
Jordan’s flap

Center for Reconstructive Urethral Surgery
Jordan’s flap

Center for Reconstructive Urethral Surgery
Jordan’s flap

Center for Reconstructive Urethral Surgery
Jordan’s flap
Dorsal Orandi’s flap
Dorsal Orandi’s flap
Dorsal Orandi’s flap
Dorsal Orandi’s flap
Dorsal Orandi’s flap
Dorsal Orandi’s flap

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Dorsal Orandi’s flap
Dorsal Orandi’s flap

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Asopa’s graft

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Asopa’s graft

Center for Reconstructive Urethral Surgery
Asopa’s graft

Center for Reconstructive Urethral Surgery
Asopa’s graft
Asopa’s graft
## One-stage penile flap or graft urethroplasty

### Results

<table>
<thead>
<tr>
<th>Patients</th>
<th>Type of Repair</th>
<th>Success</th>
</tr>
</thead>
<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>
</tbody>
</table>

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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 background, training and preference.
Two-stage penile urethroplasty
Two-stage urethroplasty using oral mucosal graft
Complications following the first stage of urethroplasty

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

Barbagli et al., Eur Urol, 2006

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Second stage
Results of two-stage penile urethroplasty in patients with failed hypospadias repair

<table>
<thead>
<tr>
<th>Surgical techniques</th>
<th>Nº</th>
<th>Success</th>
<th>Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-stage techniques with penile skin</td>
<td>14</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Two-stage techniques with oral mucosa</td>
<td>17</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>31</td>
<td>21</td>
<td>10</td>
</tr>
</tbody>
</table>

Barbagli et al., Eur Urol 2006
Conclusions

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

Moreover, this two-stage procedure, also in the hands of skilled surgeon, showed an high complications rate either following the first stage or the second stage.
Bulbar urethroplasty

Which type of urethroplasty?
Bulbar urethroplasty

The surgical technique for the repair of bulbar urethral strictures is selected according to the stricture length.
Preparation of the patient

Simple lithotomy position

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Preparation of the patient

Allen stirrups with sequential inflatable compression sleeves
Urethral stricture ranging from 1 to 2 cm

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
The urethra is spatuled for 1 cm on both ends

A total of 10 interrupted 4-zero polyglactin sutures are put in place before tying
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
Two ml of fibrin glue are injected over the urethra to prevent urinary leakage
Results of 165 end-to-end anastomosis

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<table>
<thead>
<tr>
<th>Success</th>
<th>150 (90.9%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure</td>
<td>15 (9.1%)</td>
</tr>
</tbody>
</table>

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In our experience, out of 60 patients who underwent end-to-end anastomosis:

• 14 (23.3%) experienced ejaculatory dysfunction

• 11 (18.3%) had decreased glans sensitivity

• 7 (11.6%) experienced a glans that was neither full or not swollen during erection

• 1 (1.6%) experienced a cold glans during erection

Barbagli G. et al, J Urol 2007
Urethral stricture ranging from 2 to 3 cm

Augmented roof-strip anastomosis
Two surgical teams work simultaneously
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 of 24 augmented anastomotic repair using dorsal oral mucosal graft

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<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>success</td>
<td>19 (79.2%)</td>
</tr>
<tr>
<td>failure</td>
<td>5 (20.8%)</td>
</tr>
</tbody>
</table>
Urethral stricture more than 3 cm in length

Substitution urethroplasty

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Dorsal onlay graft urethroplasty
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Center for Reconstructive Urethral Surgery
Results of 22 dorsal buccal mucosal onlay graft urethroplasty

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<table>
<thead>
<tr>
<th>success</th>
<th>17 (77.3%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>failure</td>
<td>5 (22.7%)</td>
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Ventral onlay graft urethroplasty
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Results of 93 ventral buccal mucosal onlay graft urethroplasties

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<table>
<thead>
<tr>
<th>Success</th>
<th>85 (91.4%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure</td>
<td>8 (8.6%)</td>
</tr>
</tbody>
</table>
Which type of substitution urethroplasty is best?

- ventral
- dorsal
Trauma/Reconstruction/Diversion

BULBAR URETHROPLASTY USING BUCCAL MUCOSA GRAFTS PLACED ON THE VENTRAL, DORSAL OR LATERAL SURFACE OF THE URETHRA: ARE RESULTS AFFECTED BY THE SURGICAL TECHNIQUE?

GUIDO BARBAGLI, ENZO PALMINTERI, GIORGIO GUAZZONI, FRANCESCO MONTORSI, DAMIANO TURINI AND MASSIMO LAZZERI*

From the Center for Urethral and Genitalia Reconstructive Surgery (GB, EP), Arezzo, San Raffaele-Vita-Salute Hospital and University (GG, FM), Milan, Department of Urology, Santa Chiara (DT), Florence and Department of Urology, Ospedale Fondazione San Raffaele Giglio (ML), Cefalu, Italy

J Urol 2005
Results

ventral
83% success

lateral
83% success

dorsal
85% success

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Substitution urethroplasty

Results
(revised on December 31, 2007)

<table>
<thead>
<tr>
<th>type of repair</th>
<th>success</th>
</tr>
</thead>
<tbody>
<tr>
<td>ventral OMG</td>
<td>91 %</td>
</tr>
<tr>
<td>lateral OMG</td>
<td>83 %</td>
</tr>
<tr>
<td>dorsal OMG</td>
<td>77 %</td>
</tr>
</tbody>
</table>

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Comparative success rate of 426 one-stage anterior urethroplasties

<table>
<thead>
<tr>
<th>Site</th>
<th>Surgical technique</th>
<th>N. patients</th>
<th>Success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>penile</td>
<td>flap</td>
<td>18</td>
<td>66.7%</td>
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</tr>
<tr>
<td>penile</td>
<td>skin graft</td>
<td>23</td>
<td>78.3%</td>
</tr>
<tr>
<td>bulbar</td>
<td>end-to-end</td>
<td>153</td>
<td>90.8%</td>
</tr>
<tr>
<td>bulbar</td>
<td>substitution</td>
<td>170</td>
<td>81.8%</td>
</tr>
<tr>
<td>bulbar</td>
<td>augmented</td>
<td>40</td>
<td>60%</td>
</tr>
</tbody>
</table>

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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

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Webster’s technique

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Webster’s technique

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Second stage
Results of 43 two-stage urethroplasty

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>success</td>
<td>24 (55.8%)</td>
</tr>
<tr>
<td></td>
<td>failure</td>
<td>19 (44.2%)</td>
</tr>
</tbody>
</table>
Conclusion

- 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.
Next month, this lecture will be fully available in our website

Thank you!