23rd ANNUAL EAU CONGRESS

ESU Course 8

Advanced course on urethral stricture surgery

26 – 29 March 2008

Milan – Italy
Which type of urethroplasty
A critical overview of results and complications
Which type of oral mucosal graft?

- cheek
- lip
- tongue
### Oral mucosal grafts

<table>
<thead>
<tr>
<th>Location</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right cheek</td>
<td>5 x 2.5 cm</td>
</tr>
<tr>
<td>Left cheek</td>
<td>5 x 2.5 cm</td>
</tr>
<tr>
<td>Lip</td>
<td>4 x 1.5 cm</td>
</tr>
<tr>
<td>Tongue</td>
<td>4 x 2.5 cm</td>
</tr>
<tr>
<td></td>
<td>4 x 2.5 cm</td>
</tr>
</tbody>
</table>

22 cm x 2.5 cm
Harvesting oral mucosal graft

Surgical tricks and tips
Two surgical teams work simultaneously
Two sets of surgical instruments

Oral mucosa

Urethroplasty

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Advantages of the double team

- Decrease of surgical time to ~ one hour
- Decrease of contamination in surgery
- Provides training opportunity for a young assistant interested in learning urethral surgery
Harvesting oral mucosal graft from the cheek
The patient is intubated through the nose, allowing the mouth to be completely free.
Appropriate mouth retractor

Only one assistant is needed to harvest the oral graft

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Taking the graft from the cheek

**Advantages**

- It is readily available from all patients
- The grafts are very easy to handle
- The grafts are thick, long and large
- The donor site scar is concealed
- It is possible to harvest two grafts
Taking the graft from the cheek

Disadvantages

?
When harvest the graft from the cheek

In patients with lichen sclerosus or failed hypospadias repair, requiring one or two long and large grafts to completely replacing the urethral plate by using two-stage procedure.
When harvest the graft from the cheek

In patient with bulbar urethral stricture, requiring one long, large, and resistant graft for one-stage dorsal or ventral onlay procedure

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Harvesting oral mucosal graft from the lip
Taking the graft from the lip

Advantages

- It is readily available from all patients
- The graft is thin
- The harvesting procedure is simple and quick and does not require nasal intubation or a special retractor
Taking the graft from the lip

Disadvantages

- Graft harvesting may have a negative aesthetic consequences
- The donor site scar is not concealed
- The graft is thin and narrow
- It is possible to harvest only one graft
When harvest the graft from the lip

In pediatric cases
When harvest the graft from the lip

- In adult patient requiring a single, small and thin graft
- When harvesting the graft from the cheek it is not possible
Harvesting oral mucosal graft from the tongue
Harvesting of lingual mucosal graft was first described by Italian authors.

The Tongue as an Alternative Donor Site for Graft Urethroplasty: A Pilot Study

Alchide Simonato,* Andrea Gregori, Andrea Lissiani, Stefano Galli, Francesco Ottaviani, Roberta Rossi, Anna Zappone and Giorgio Carmignani

From the Department of Urology "Luciano Giuliani," University of Genoa (AS, GC), Genoa and Departments of Urology (AG, AL), Pathology (RR) and Anesthesiology and Intensive Care (AZ), and Otorhinolaryngological Clinic IV (FO), "Luigi Sacco" University Medical Center (SG), Milan, Italy

Simonato et al, J Urol, 2006; 175: 589-592
The site of the harvest graft was the lateral mucosal lining of the tongue.

The length of the grafts were 3 to 7 cm (mean 3.3 cm) with a width of 1.5 cm.

Simonato et al, J Urol, 2006; 175: 589-592
Mouth opener is put into place
The ventral surface of the tongue is exposed
The opening of the Wharton’s duct is identified.
The site of the lingual nerve is identified.
The graft is measured and marked

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The graft edges are incised
The graft is removed
The graft bed is examined for bleeding
The donor site is closed with interrupted sutures
Graft defatting is necessary to remove the underlying fibrovascular tissues
The graft is 4 cm long and 2.5 cm wide
Taking the graft from the tongue

**Advantages**

- The grafts are available from all patients.
- The donor site scar is concealed.
- The grafts are thin.
- The harvesting procedure is simple and quick and does not require nasal intubation or special retractor.
- It is possible to harvest two grafts.
- The grafts are long and large.
Taking the graft from the tongue

Disadvantages

The grafts are thin
When harvest the graft from the tongue

In patient requiring a thin graft

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When harvest the graft from the tongue

When the patient underwent prior graft harvesting from both cheeks and lip
When harvest the graft from the tongue

To avoid negative aesthetic consequences in the lip
Penile urethroplasty

Which type of urethroplasty?
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

80% (40% + 40%)
20% (20%)

Barbagli 2006, unpublished data

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In patients with penile urethral strictures due to:

- trauma,
- instrumentation,
- catheter,
- infection and other causes

penis is normal
One-stage flap urethroplasty

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JORDAN

McANINCH

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Dartos fascial flap with skin island
Complications following flap urethroplasty

- penile hematoma
- skin necrosis
- fistula
- penile-glans torsion
- sacculcation
One-stage dorsal inlay oral mucosal graft urethroplasty
Complications following graft urethroplasty

infection  meatal stenosis  fistula
In patients with penile urethral strictures due to:

- failed hypospadias repair
- lichen sclerosus

penis is abnormal

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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. These repeated surgical revisions might have a tremendous psychological impact on the patient.

Barbagli et al., Eur Urol, 2006

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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
Evaluation of the results

- Patients with penile urethral stricture disease are treated with so many various surgical approaches that it is really impossible to evaluate and standardize the long-term outcome of all these techniques.

- The literature dealing with this argument is still terribly confused and does not furnish reliable interpretation of the available data.
Success rate of the Orandi-flap urethroplasty in patients with penile urethral strictures not related with lichen sclerosus or failed hypospadias repair
<table>
<thead>
<tr>
<th>authors</th>
<th>journal year</th>
<th>N. patients</th>
<th>success rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orandi</td>
<td>Br J Urol 1968</td>
<td>10</td>
<td>90 %</td>
</tr>
<tr>
<td>Webster et al</td>
<td>J Urol 1985</td>
<td>6</td>
<td>83.3 %</td>
</tr>
<tr>
<td>Webster et al</td>
<td>J Urol 1985</td>
<td>8</td>
<td>87.5 %</td>
</tr>
<tr>
<td>de la Rosette et al</td>
<td>J Urol 1991</td>
<td>26</td>
<td>80 %</td>
</tr>
<tr>
<td>Greenwell et al</td>
<td>BJU Int 1999</td>
<td>8</td>
<td>87.5 %</td>
</tr>
<tr>
<td>Joseph et al</td>
<td>J Urol 2002</td>
<td>4</td>
<td>75 %</td>
</tr>
<tr>
<td>Joseph et al</td>
<td>J Urol 2003</td>
<td>20</td>
<td>95 %</td>
</tr>
</tbody>
</table>
# 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>15</td>
<td>oral graft</td>
<td>78.6%</td>
</tr>
<tr>
<td>17</td>
<td>skin graft</td>
<td>70.6%</td>
</tr>
</tbody>
</table>

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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.
End-to-end anastomosis

Urethral stricture ranging from 1 to 2 cm
### End-to-end or substitution urethroplasty?

<table>
<thead>
<tr>
<th>patients</th>
<th>type of repair</th>
<th>success</th>
<th>complications *</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>end-to-end</td>
<td>26 (83%)</td>
<td>18%</td>
</tr>
<tr>
<td>19</td>
<td>oral graft</td>
<td>19 (100%)</td>
<td>0</td>
</tr>
</tbody>
</table>

*penile chordee or erectile dysfunction*

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Al-Qudah et al., J Urol, 2006
To transect or no transect the urethra? This is the question!
Augmented anastomotic repair

Urethral stricture ranging from 2 to 4 cm

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Augmented anastomotic repair

Dorsal roof-strip
Augmented anastomotic repair

Ventral floor-strip

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**Augmented anastomotic repair**

### Results

<table>
<thead>
<tr>
<th>authors</th>
<th>type of repair</th>
<th>success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guralnick et al.</td>
<td>dorsal OMG</td>
<td>93 %</td>
</tr>
<tr>
<td>Abouassaly et al.</td>
<td>dorsal or ventral OMG</td>
<td>90 %</td>
</tr>
<tr>
<td>El-Kassaby et al.</td>
<td>ventral OMG</td>
<td>93 %</td>
</tr>
</tbody>
</table>
**Augmented anastomotic repair**

**Results**

<table>
<thead>
<tr>
<th>type of repair</th>
<th>success</th>
</tr>
</thead>
<tbody>
<tr>
<td>dorsal OMG</td>
<td>79 %</td>
</tr>
<tr>
<td>dorsal skin graft</td>
<td>33 %</td>
</tr>
<tr>
<td>ventral OMG</td>
<td>28 %</td>
</tr>
</tbody>
</table>

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Substitution urethroplasty

Urethral stricture more than 4 cm in length
Which type of substitution urethroplasty

ventral

dorsal
# Dorsal onlay graft urethroplasty

## Published results

<table>
<thead>
<tr>
<th>Authors</th>
<th>Patients</th>
<th>Mean follow-up</th>
<th>Success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iselin et al.</td>
<td>12</td>
<td>19</td>
<td>100%</td>
</tr>
<tr>
<td>J Urol 1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andrich et al.</td>
<td>42</td>
<td>60</td>
<td>88%</td>
</tr>
<tr>
<td>B J U Int 2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delvecchio et al.</td>
<td>11</td>
<td>\</td>
<td>90%</td>
</tr>
<tr>
<td>J Urol 2004</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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## Ventral onlay graft urethroplasty

### Published Results

<table>
<thead>
<tr>
<th>Authors</th>
<th>Patients</th>
<th>Mean Follow-up</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kane et al.</td>
<td>53</td>
<td>25</td>
<td>94%</td>
</tr>
<tr>
<td>J Urol 2002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elliot et al.</td>
<td>60</td>
<td>47</td>
<td>90%</td>
</tr>
<tr>
<td>J Urol 2003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kellner et al.</td>
<td>18</td>
<td>50</td>
<td>88%</td>
</tr>
<tr>
<td>J Urol 2004</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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), Areezo, 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
Results

Ventral
83% success

Lateral
83% success

Dorsal
85% success

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# Substitution urethroplasty

## Results

( up-to dated at 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>
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.
www.urethralcenter.it

This lecture is fully available on our website

Thank you!

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