

# Guido Barbagli

Center for Reconstructive Urethral Surgery

Arezzo - Italy

E-mail: [guido@rdn.it](mailto:guido@rdn.it)

Website: [www.urethralcenter.it](http://www.urethralcenter.it)

**23<sup>rd</sup> ANNUAL EAU CONGRESS**

**ESU Course 8**

**Advanced course on urethral stricture  
surgery**

**26 – 29 March 2008**

**Milan – Italy**



**Center for Reconstructive Urethral Surgery**



# **Which type of urethroplasty**

## **A critical overview of results and complications**



# Which type of oral mucosal graft ?



**cheek**



**lip**



**tongue**



# Oral mucosal grafts

right cheek	5 x 2.5 cm
left cheek	5 x 2.5 cm
lip	4 x 1.5 cm
tongue	4 x 2.5 cm
	4 x 2.5 cm



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**





# Advantages of the double team

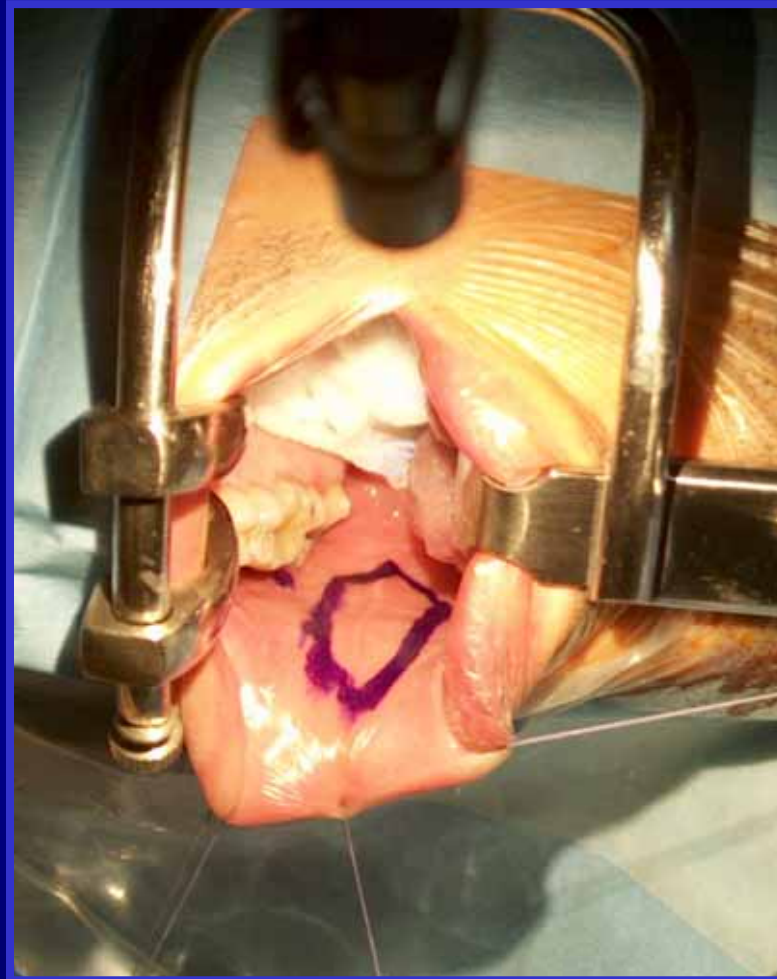
decrease of  
surgical time  
to ~ one hour

decrease of  
contamination in  
surgery

provides training  
opportunity for a young  
assistant interested in  
learning urethral surgery

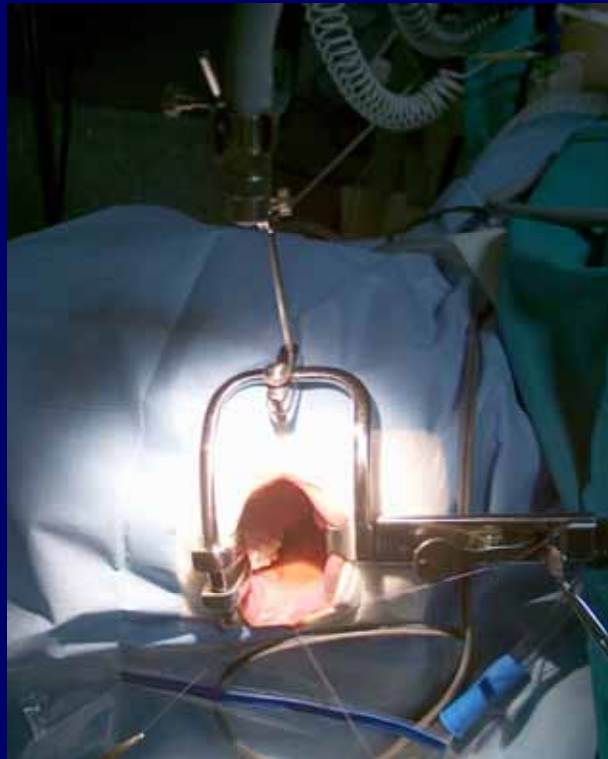


# Harvesting oral mucosal graft from the cheek



**The patient is intubated through the nose,  
allowing the mouth to be completely free**



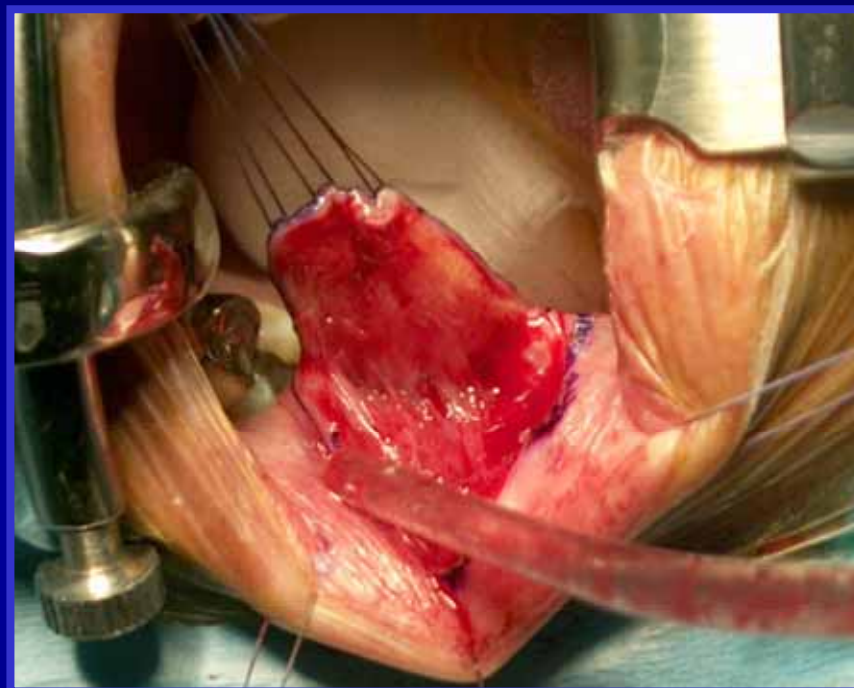
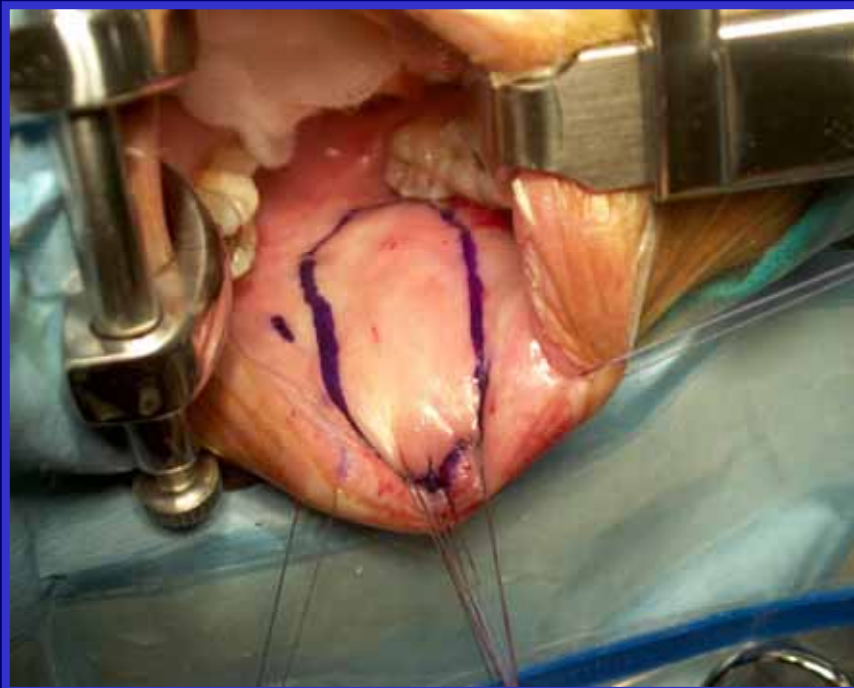


**Appropriate mouth  
retractor**

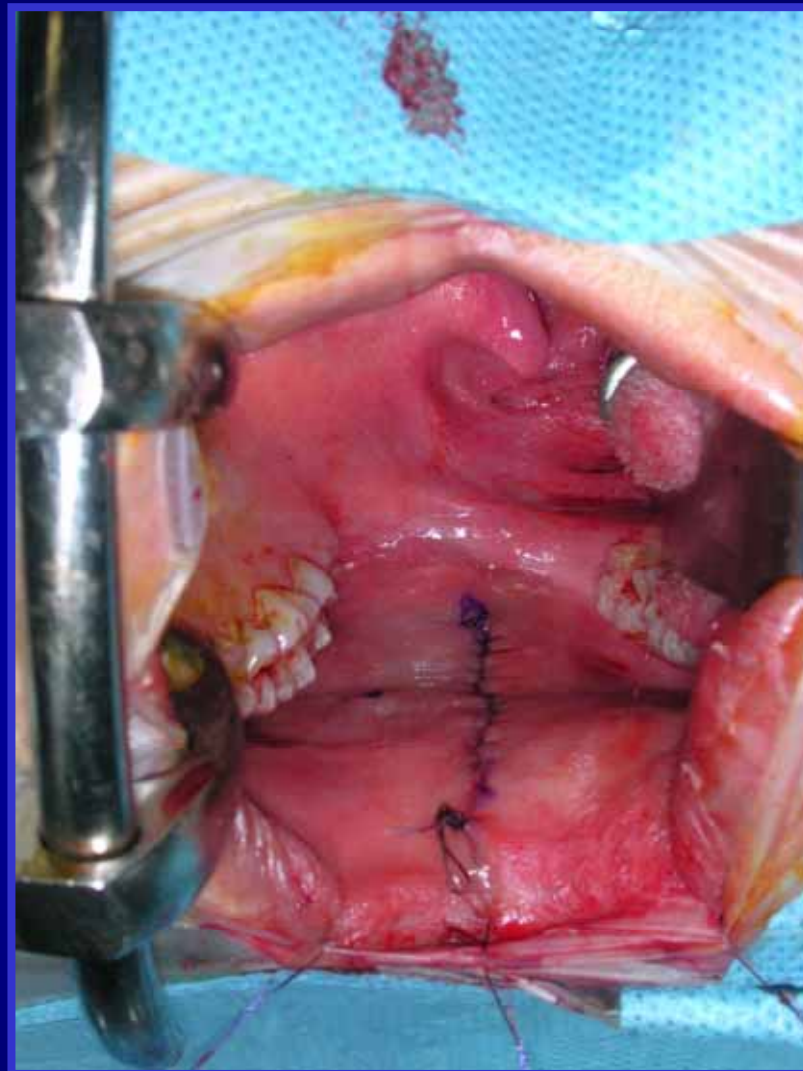
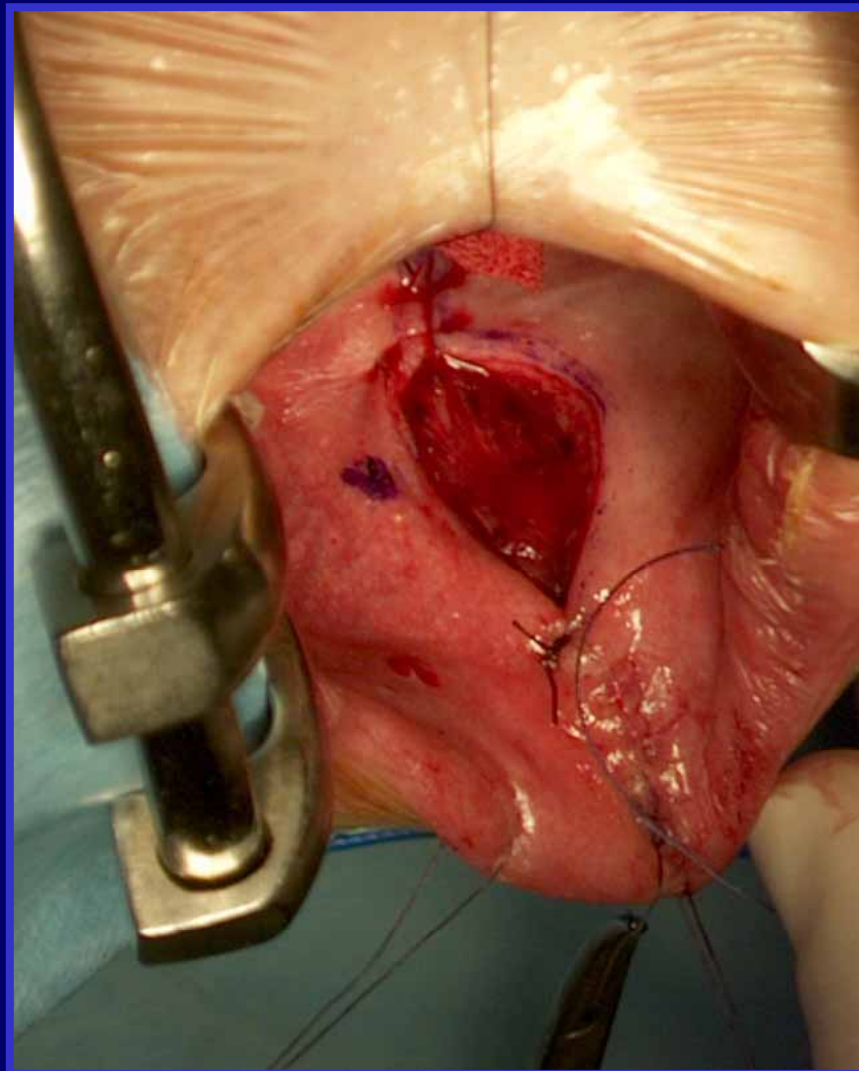


**Only one assistant is needed  
to harvest the oral graft**

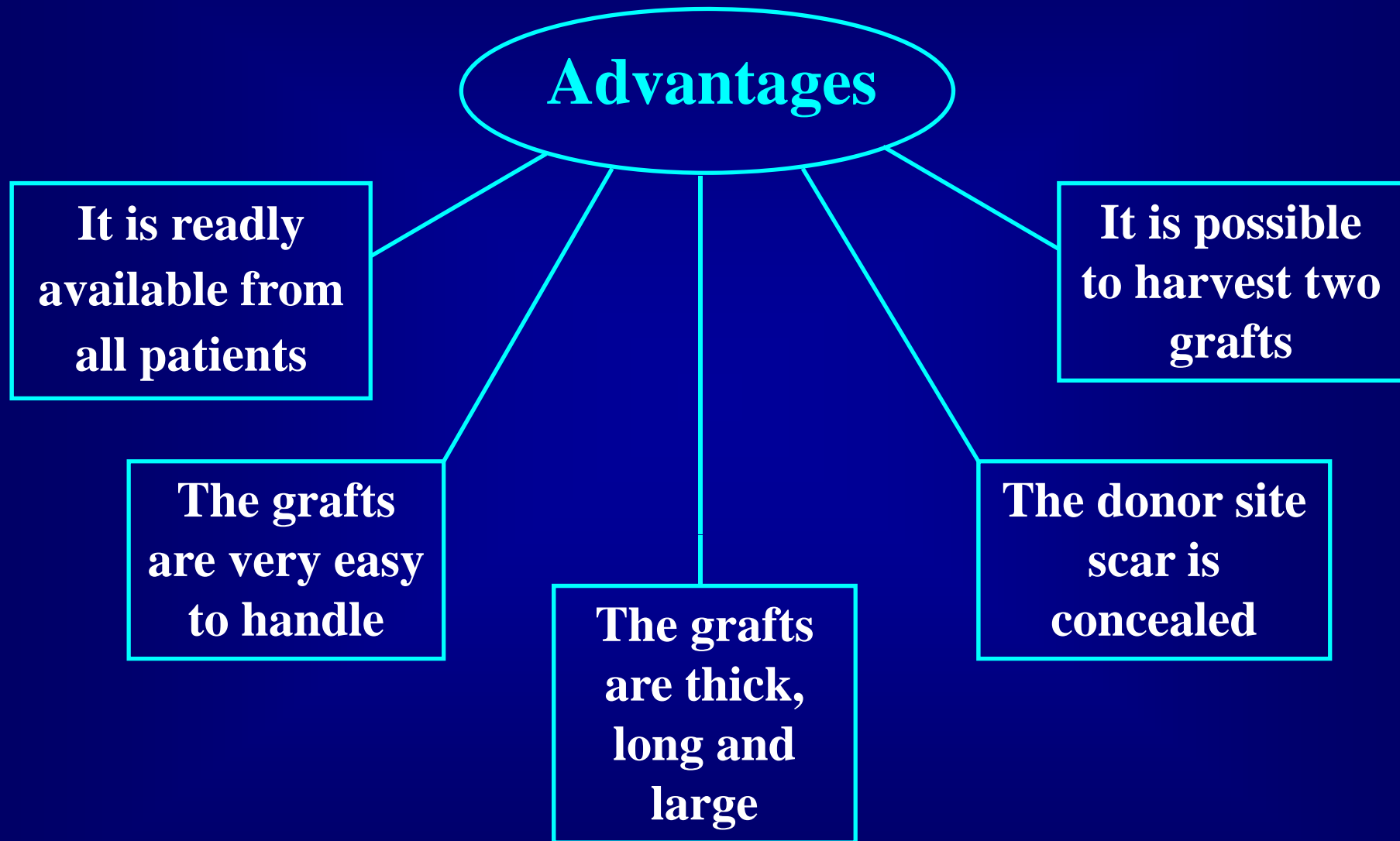








# Taking the graft from the cheek





# Taking the graft from the cheek

**Disadvantages**

?



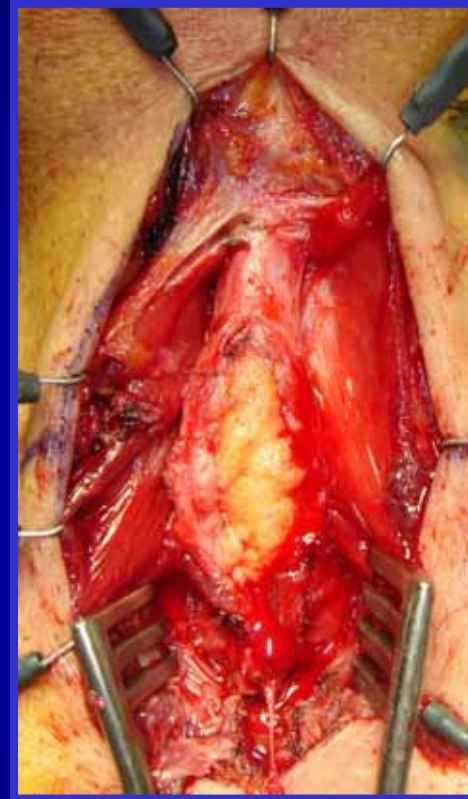
## When harvest the graft from the cheek



In patients with **lichen sclerosis** 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



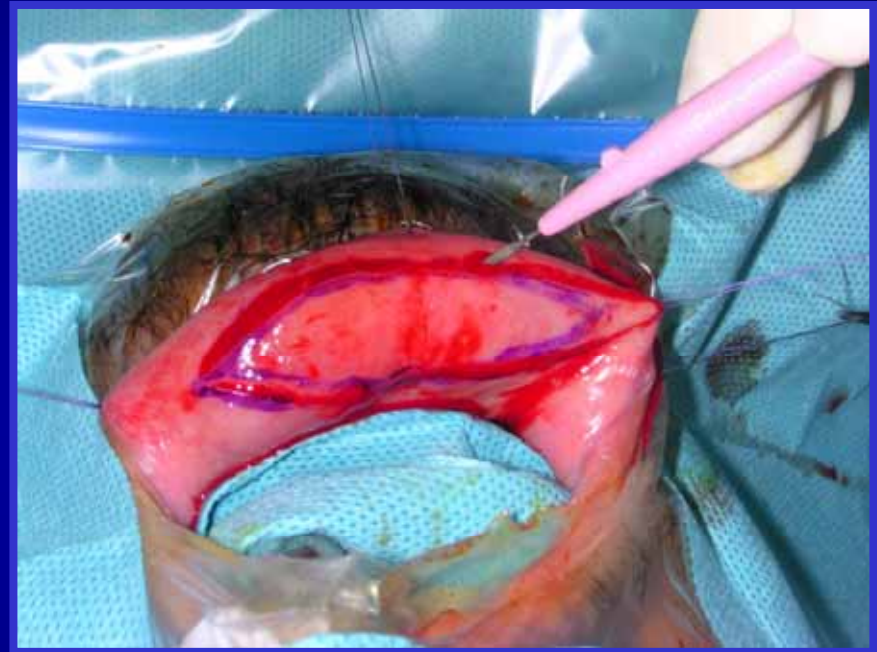
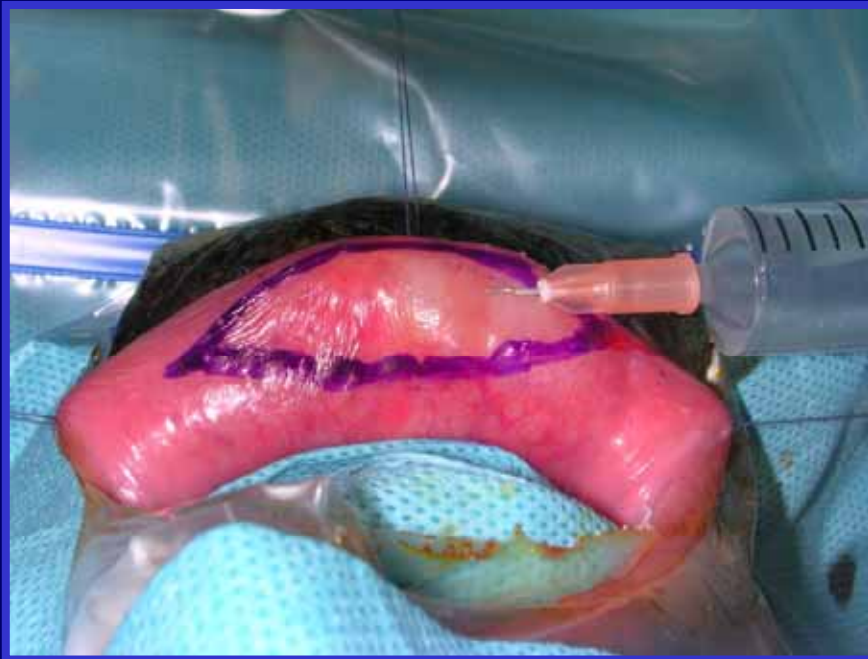
**In patient with bulbar urethral stricture, requiring one long, large, and resistant graft for one-stage dorsal or ventral onlay procedure**



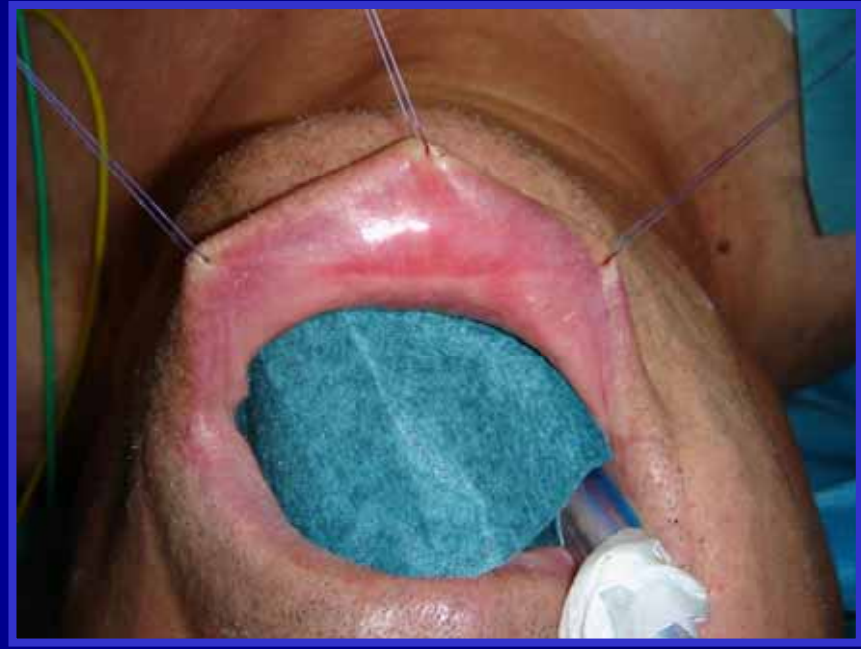
# Harvesting oral mucosal graft from the lip





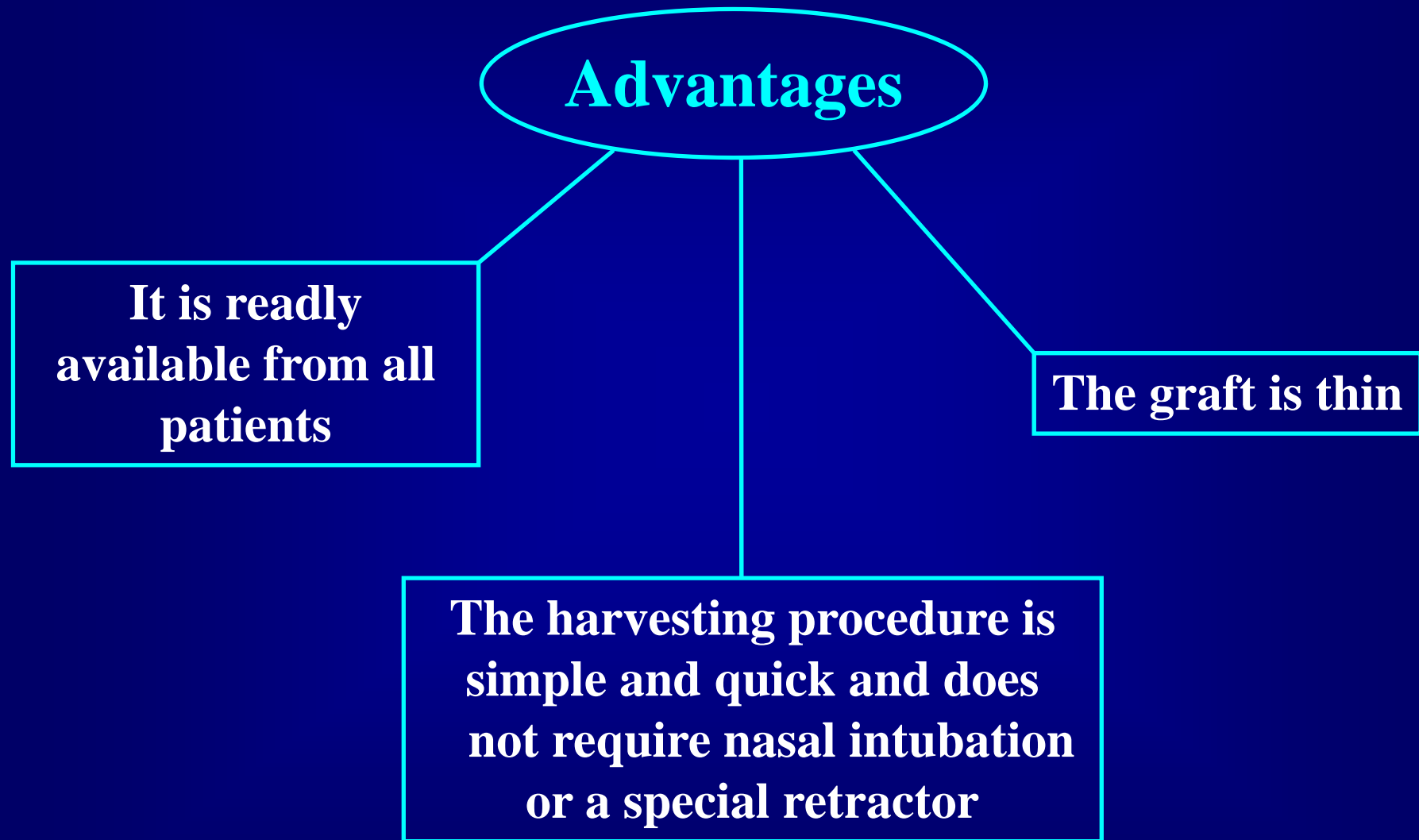








# Taking the graft from the lip



# Taking the graft from the lip

## Disadvantages

```
graph TD; A([Disadvantages]) --- B[It is possible to harvest only one graft]; A --- C[Graft harvesting may have a negative aesthetic consequences]; A --- D[The donor site scar is not concealed]; A --- E[The graft is thin and narrow];
```

**It is possible to harvest only one graft**

**Graft harvesting may have a negative aesthetic consequences**

**The graft is thin and narrow**

**The donor site scar is not concealed**



# When harvest the graft from the lip



In pediatric cases



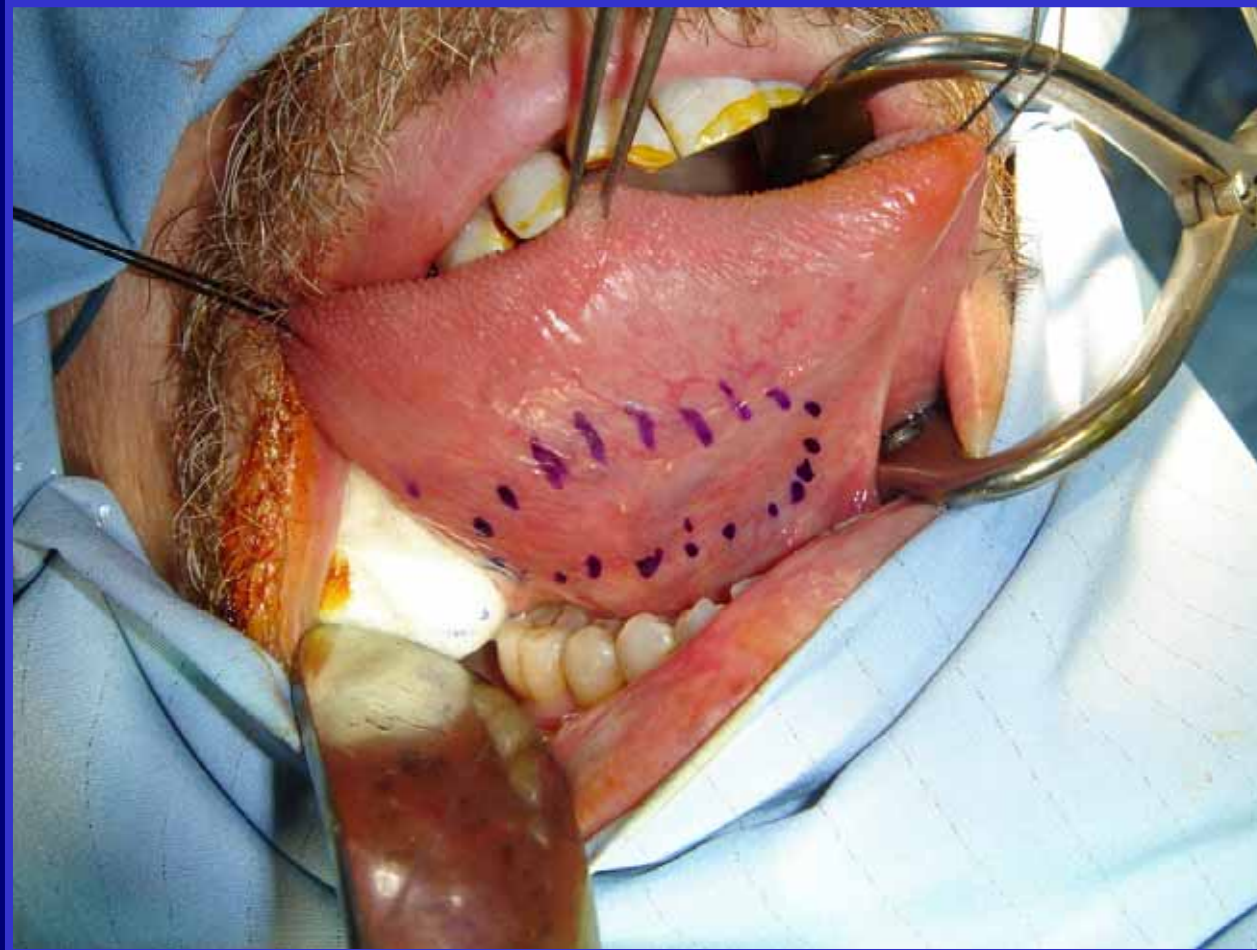
## When harvest the graft from the lip



- 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

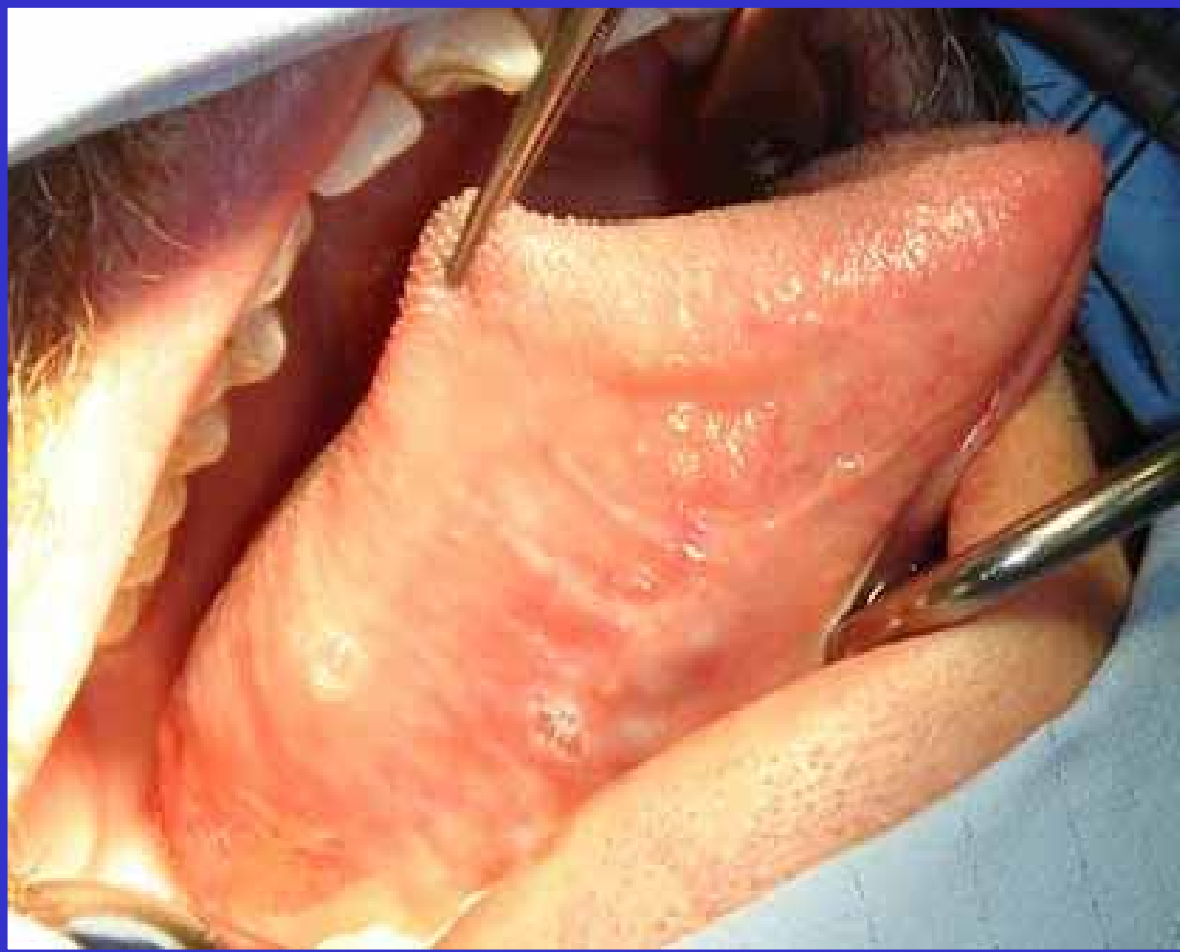
## **The Tongue as an Alternative Donor Site for Graft Urethroplasty: A Pilot Study**

**Alchiede 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**

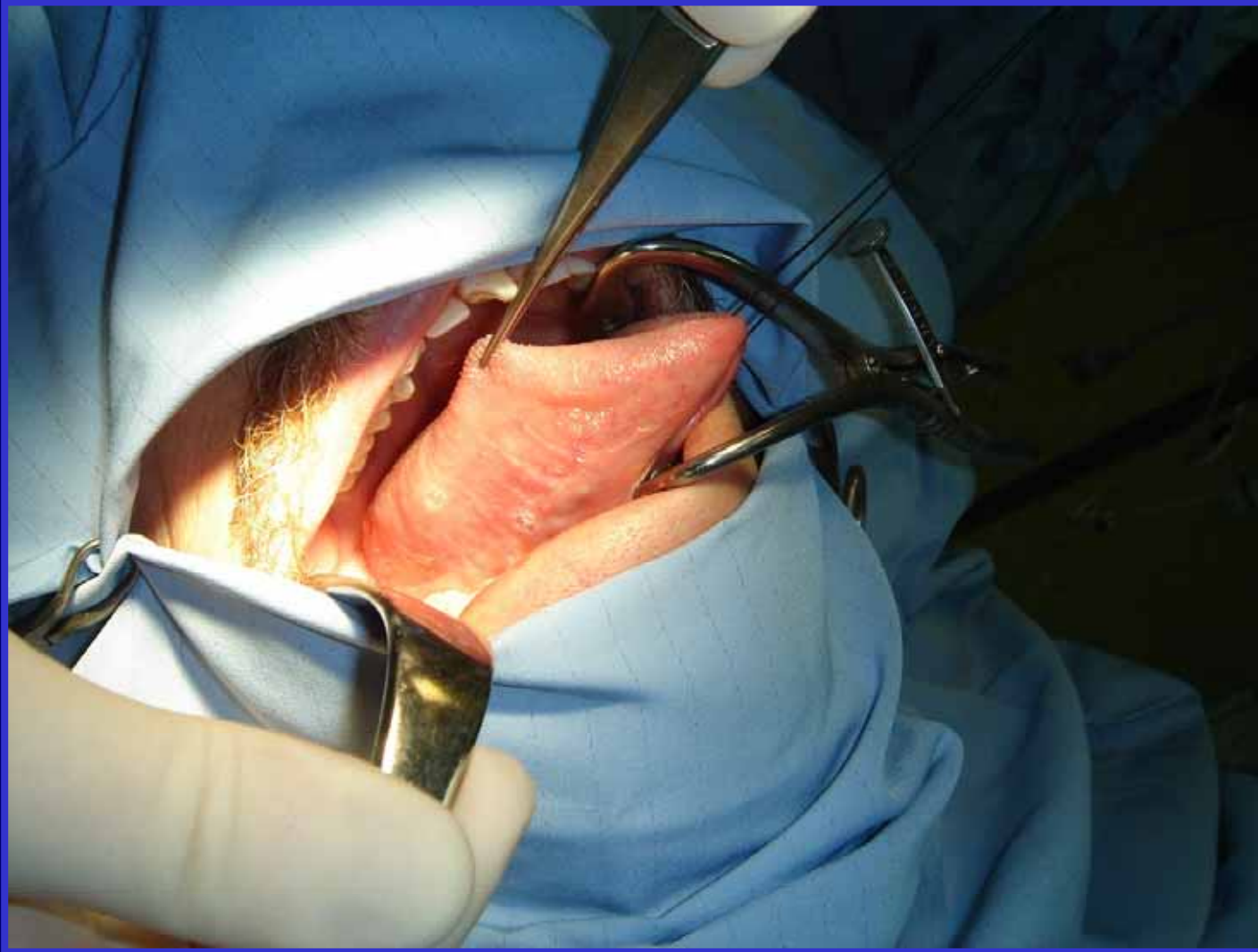






**Mouth opener is put into place**





**The ventral surface of the tongue is exposed**





**The opening of the Wharton's duct is identified**

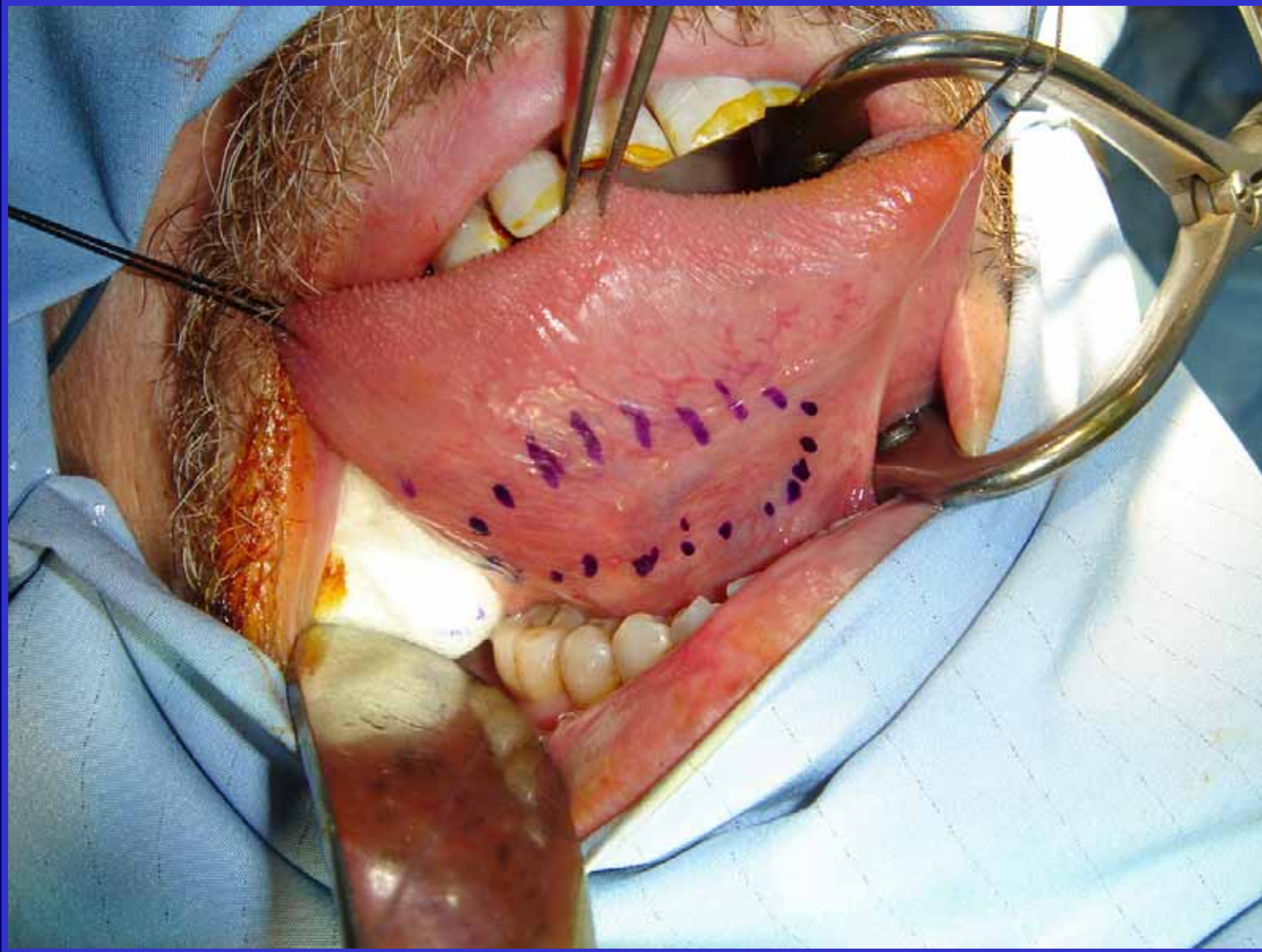






**The site of the lingual nerve is identified**

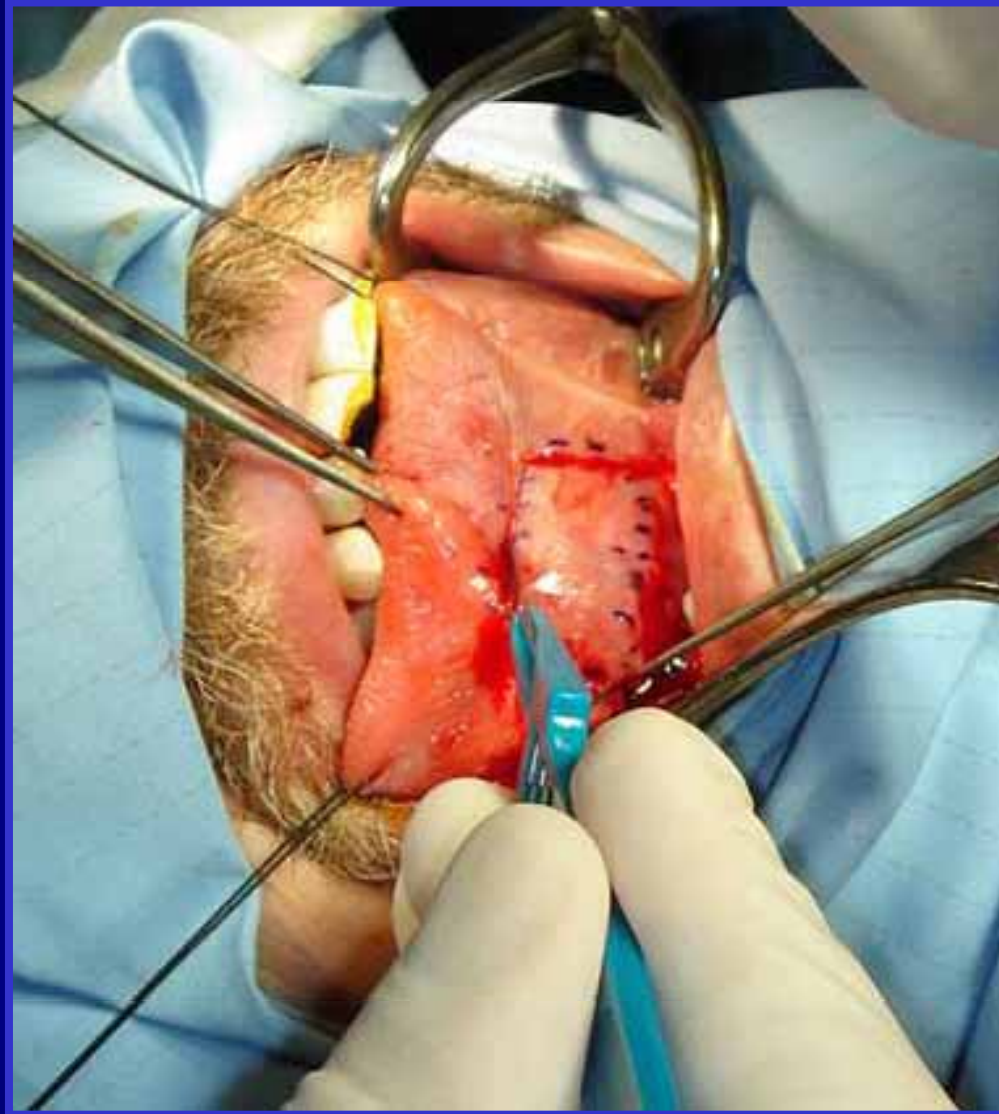




**The graft is measured and marked**

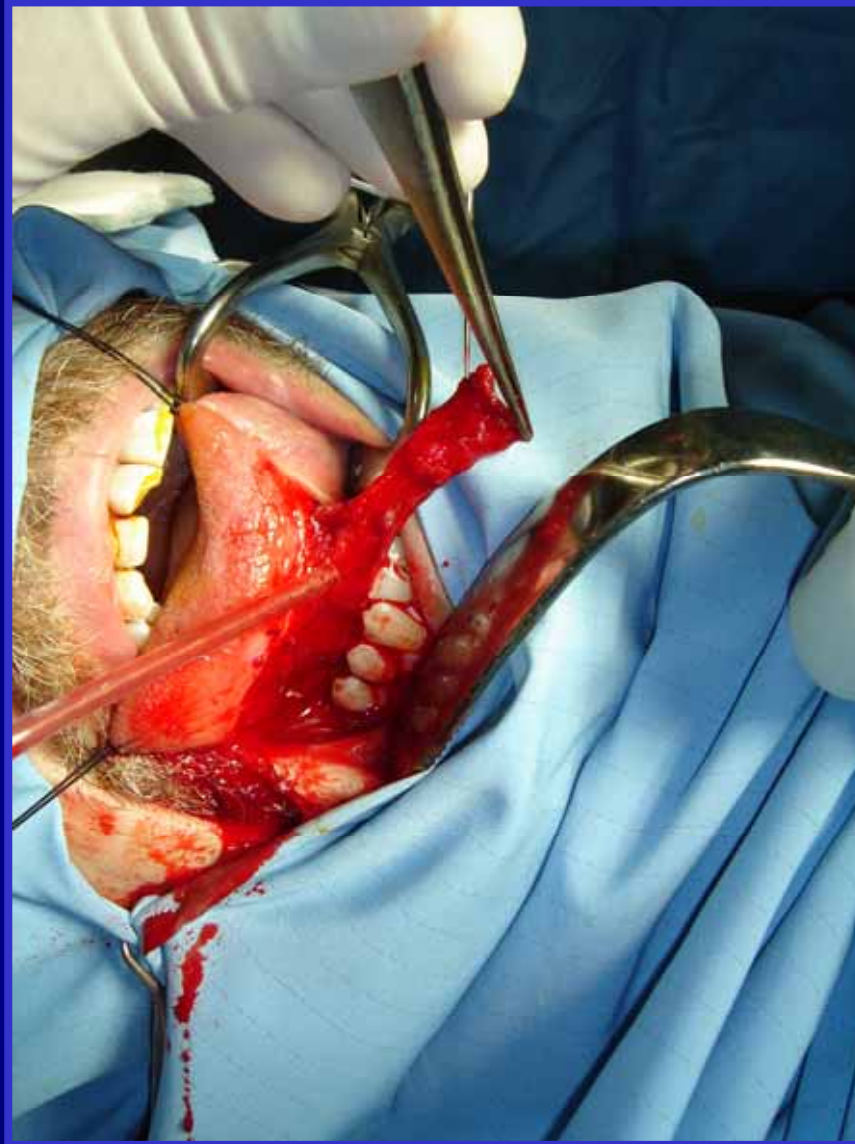






**The graft edges are incised**

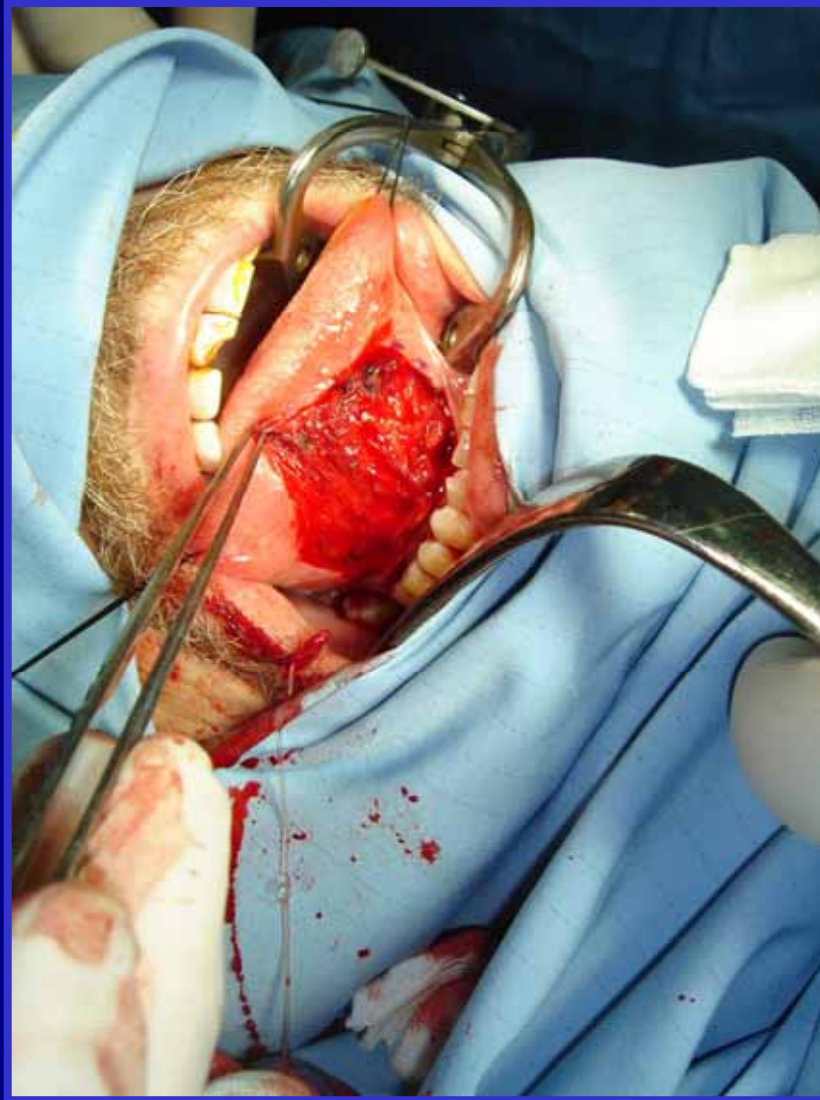




**The graft is removed**

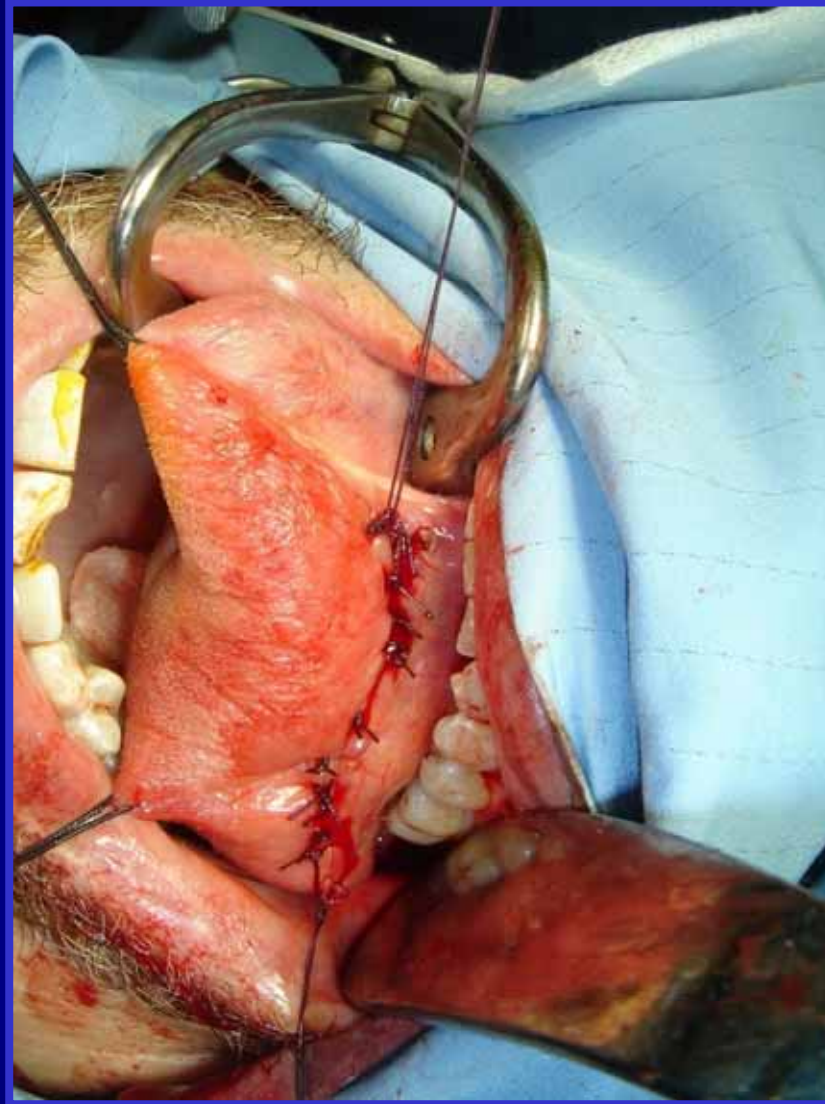






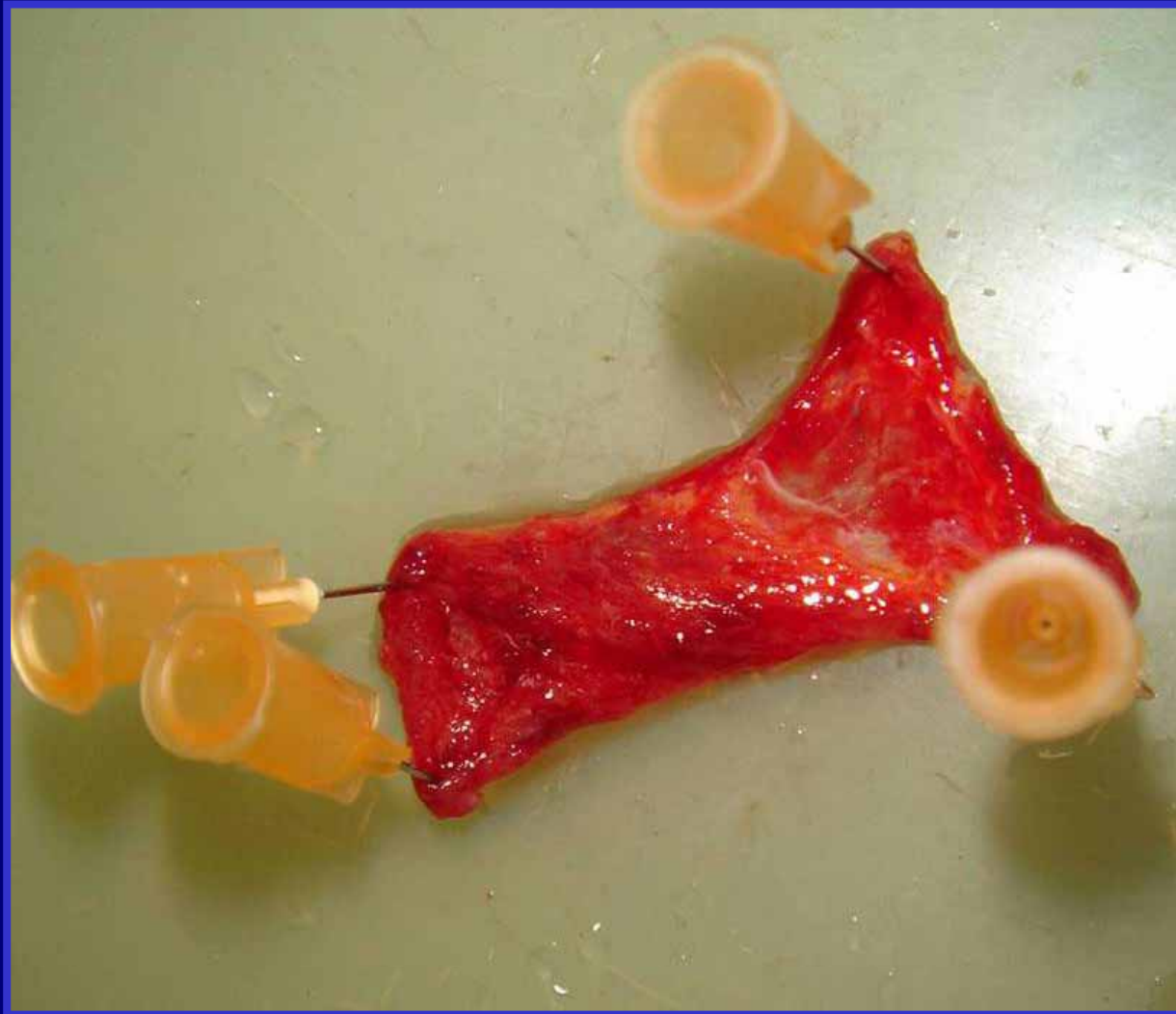
**The graft bed is examined for bleeding**





**The donor site is closed with interrupted sutures**





**Graft defatting is necessary to remove the underlying fibrovascular tissues**

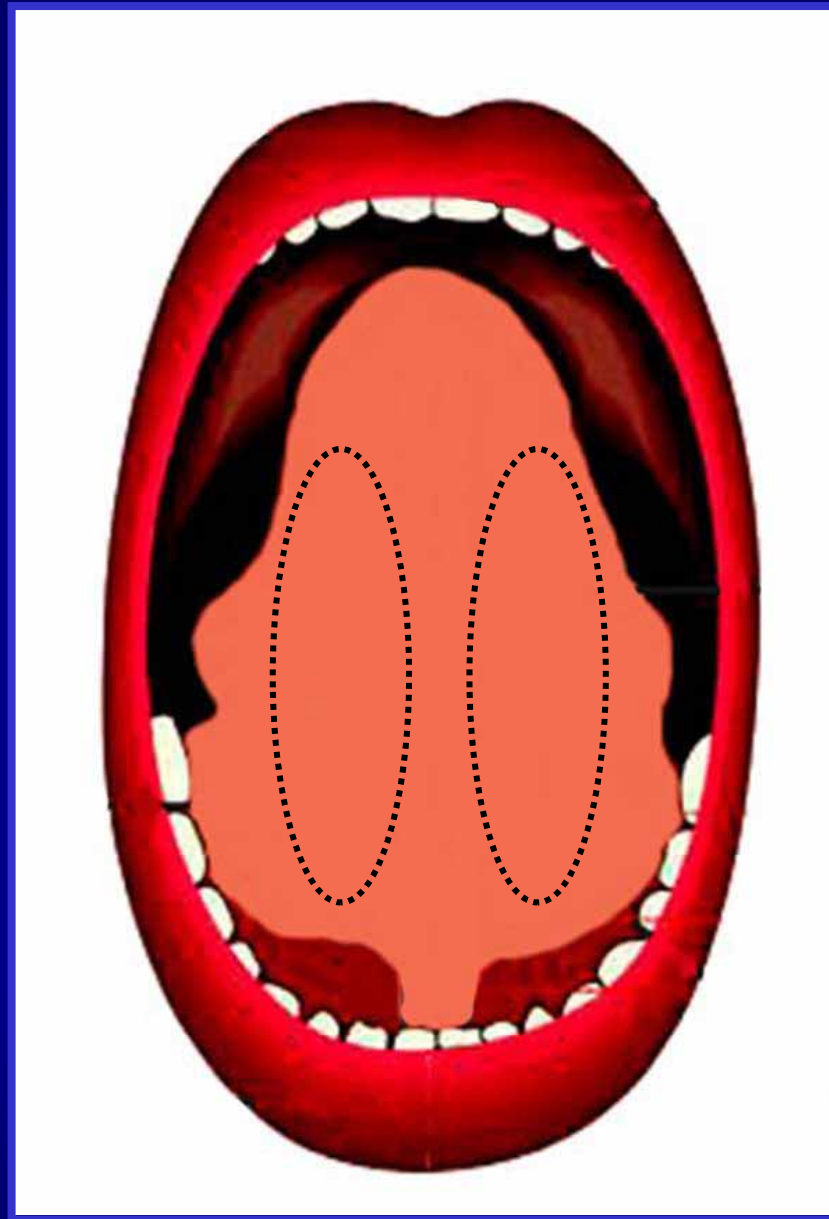




**The graft is 4 cm long and 2.5 cm wide**

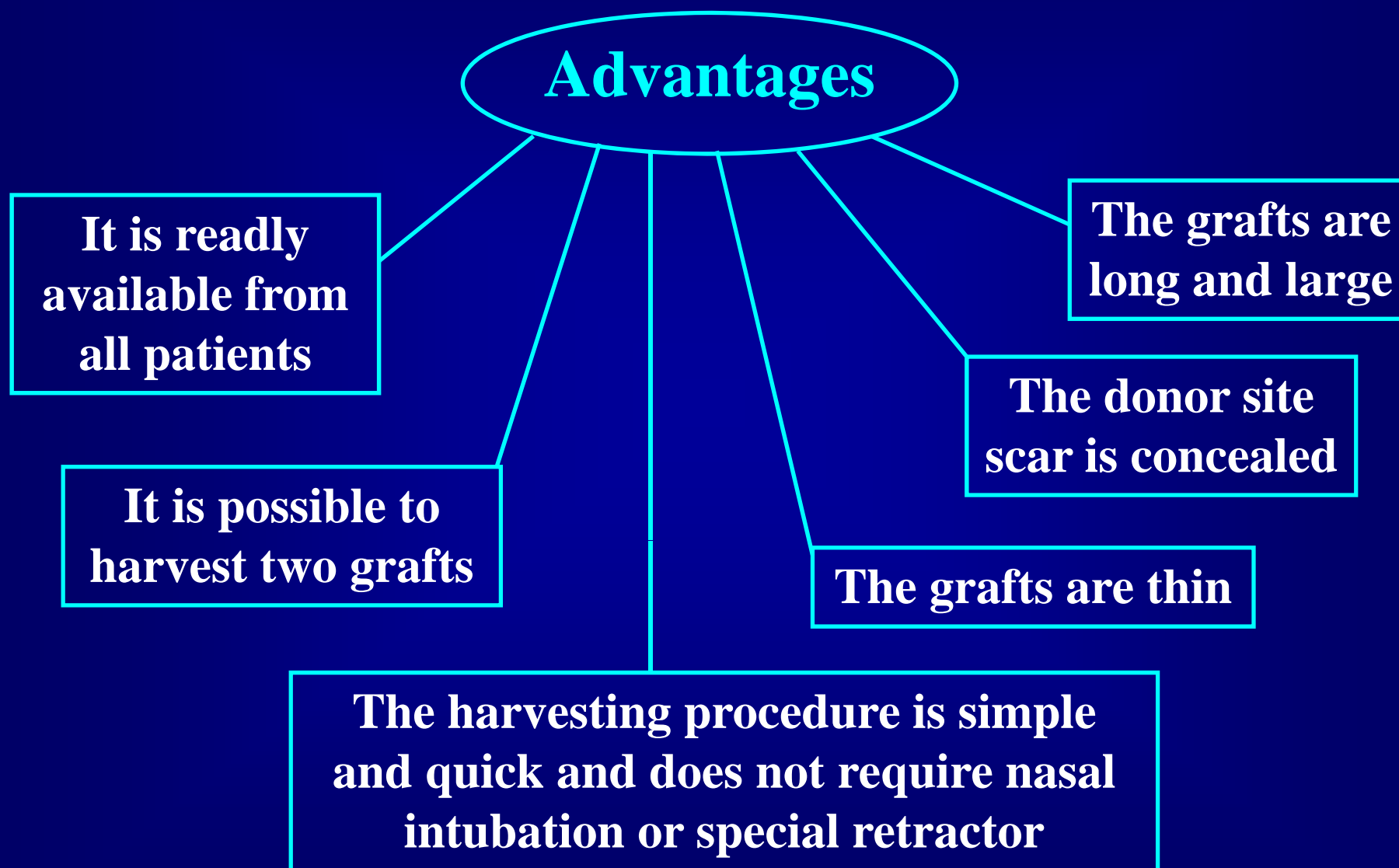








# Taking the graft from the tongue



# Taking the graft from the tongue

**Disadvantages**

**The grafts are thin**



# When harvest the graft from the tongue



In patient requiring a thin graft



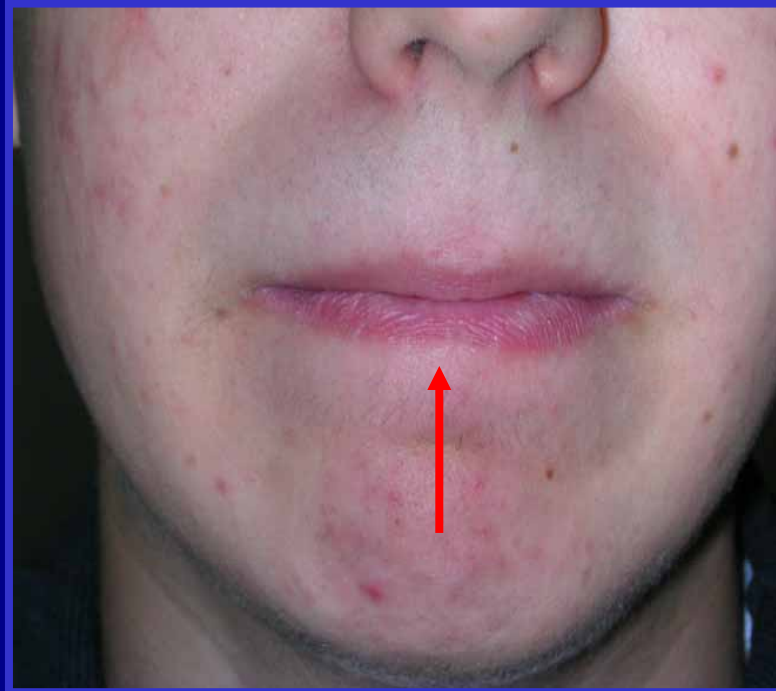
## When harvest the graft from the tongue



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



**When harvest the graft from the tongue**



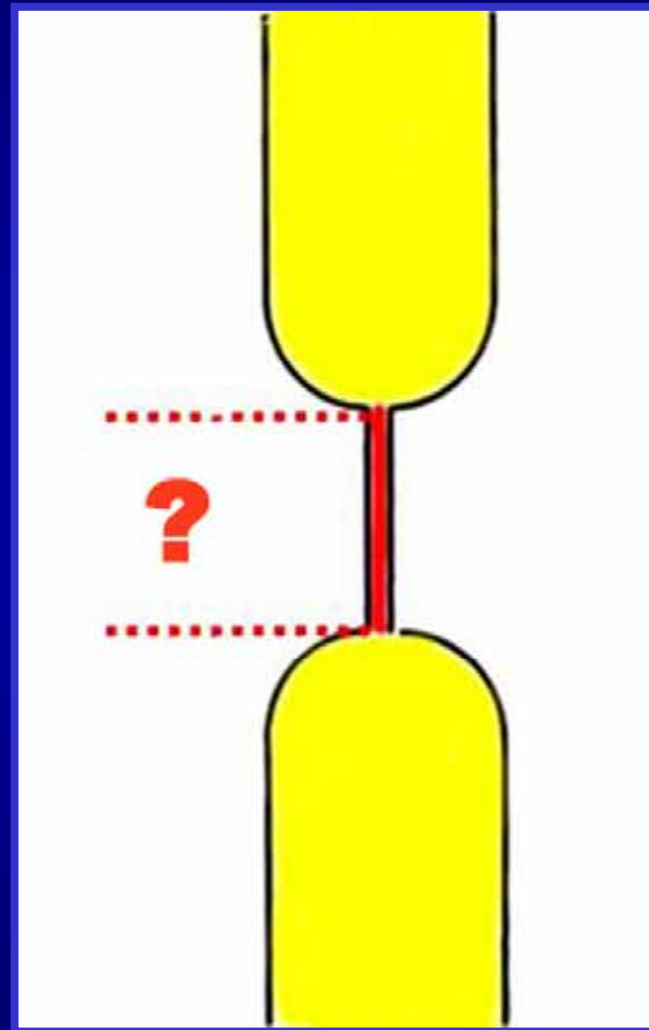
**To avoid negative aesthetic consequences in the lip**





# Penile urethroplasty

Which type of  
urethroplasty ?

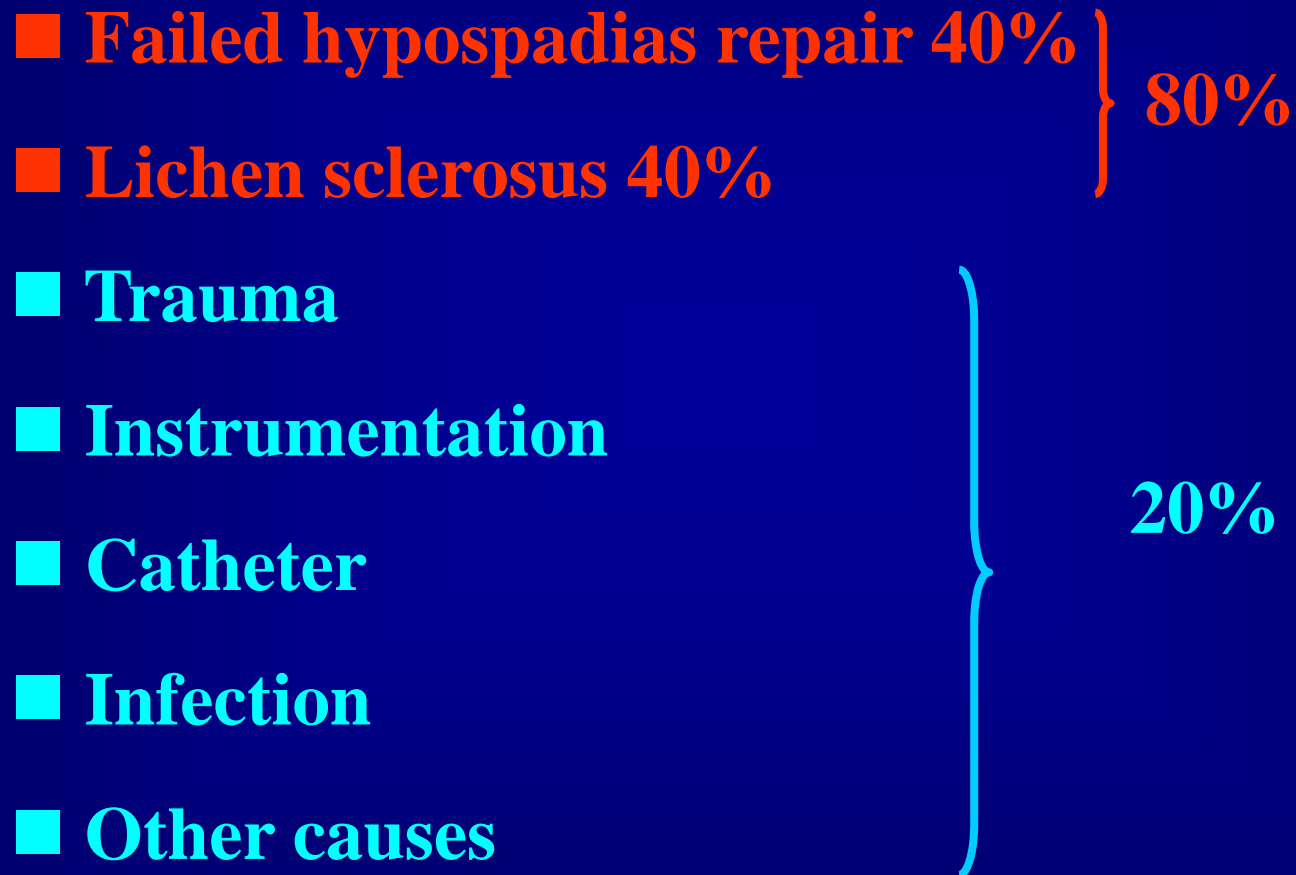


# Penile urethroplasty

The surgical technique for the repair of penile urethral strictures is selected according to stricture etiology



# Etiology of penile urethral strictures in 404 patients



Barbagli 2006, unpublished data



**In patients with penile urethral strictures due to:  
trauma, instrumentation, catheter, infection and other causes**

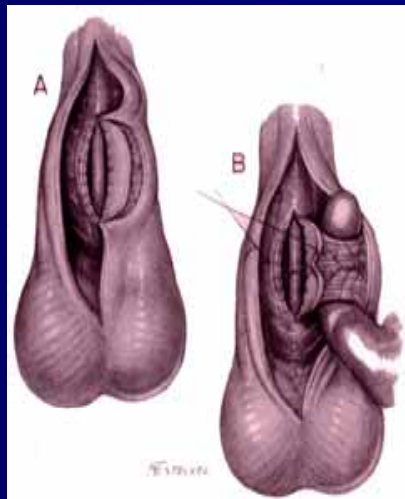


**penis is normal**

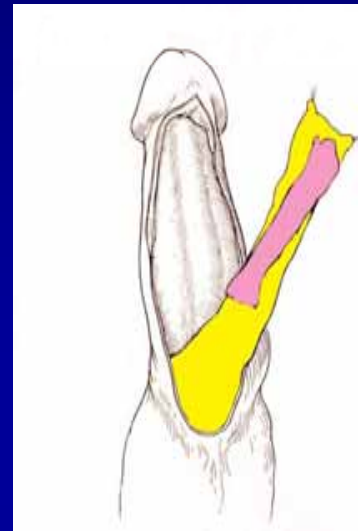




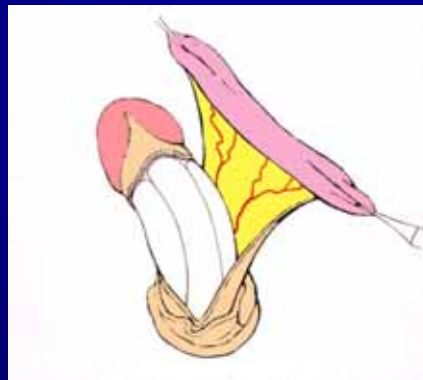
# One-stage flap urethroplasty



**ORANDI**



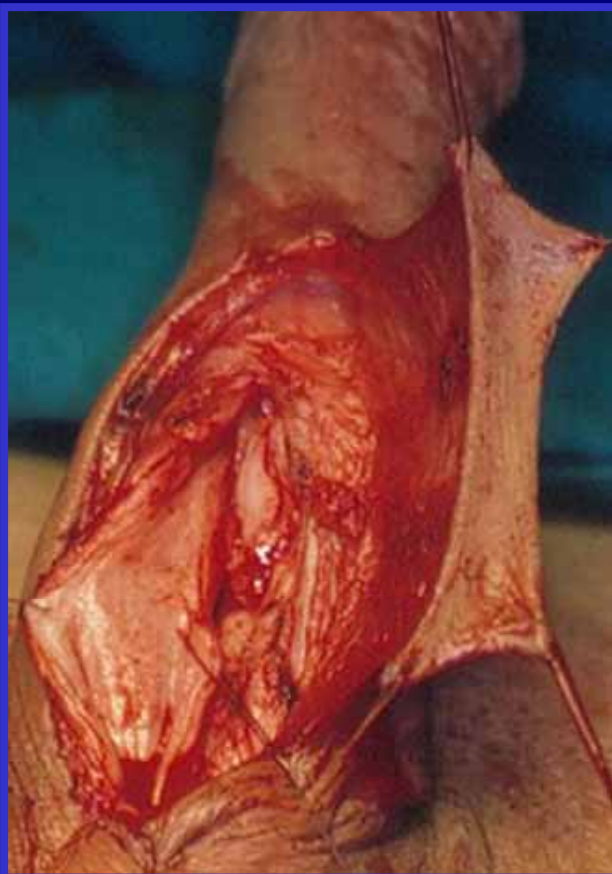
**JORDAN**



**McANINCH**



# Dartos fascial flap with skin island



# Complications following flap urethroplasty



penile hematoma



skin necrosis



fistula



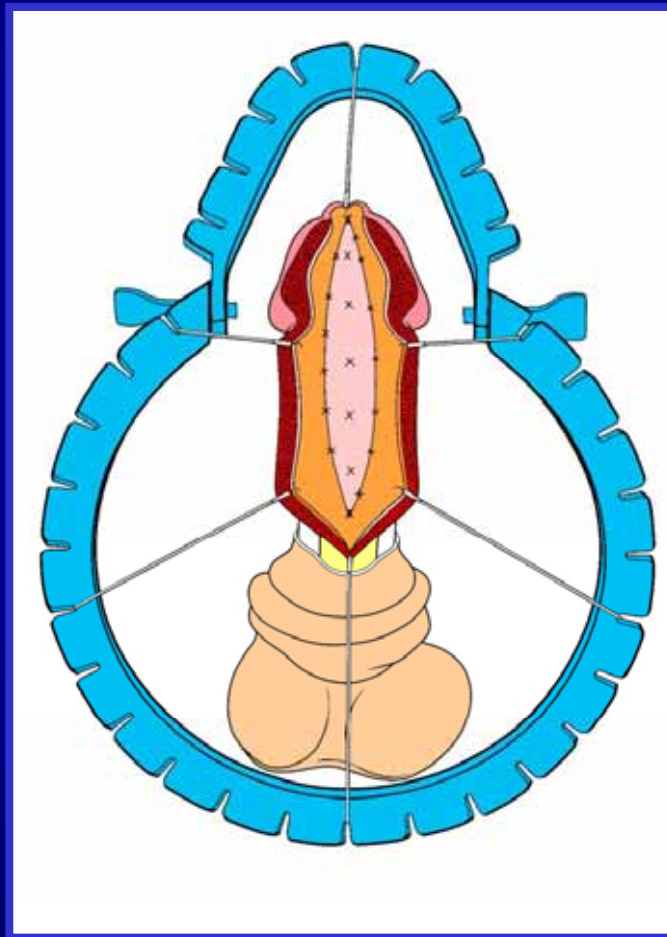
penile-glans torsion



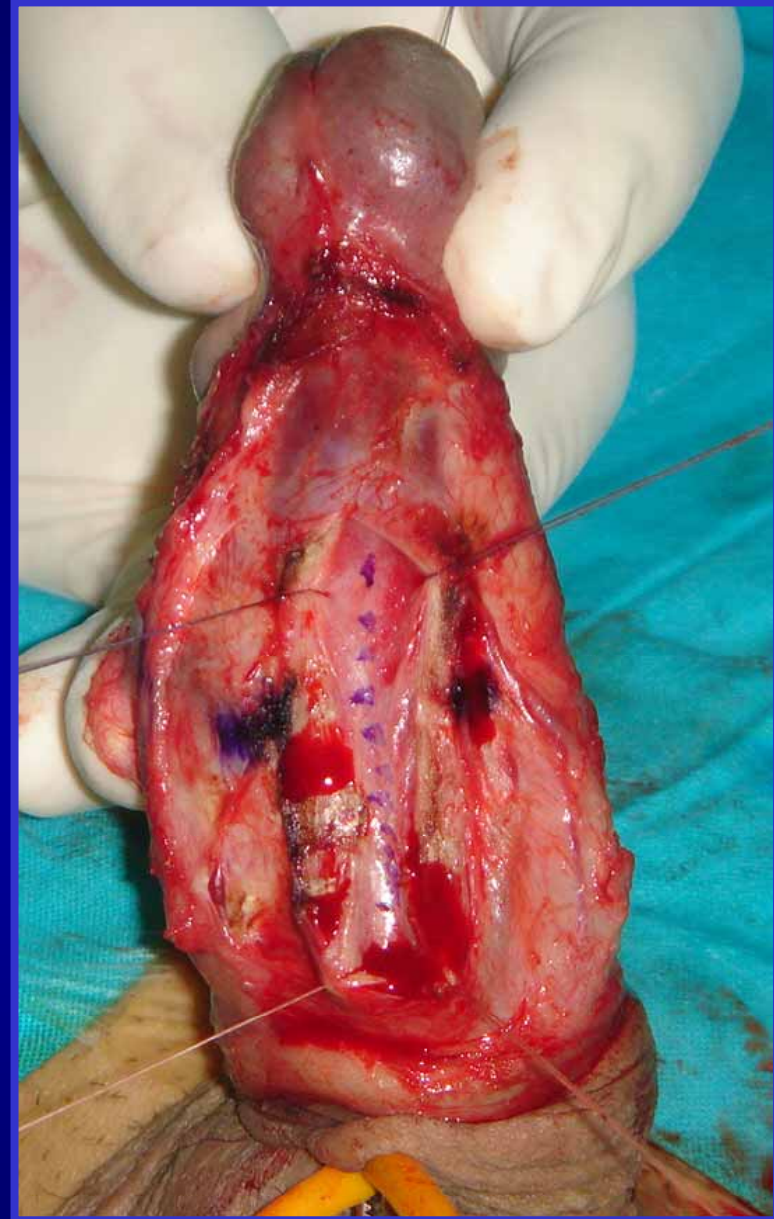
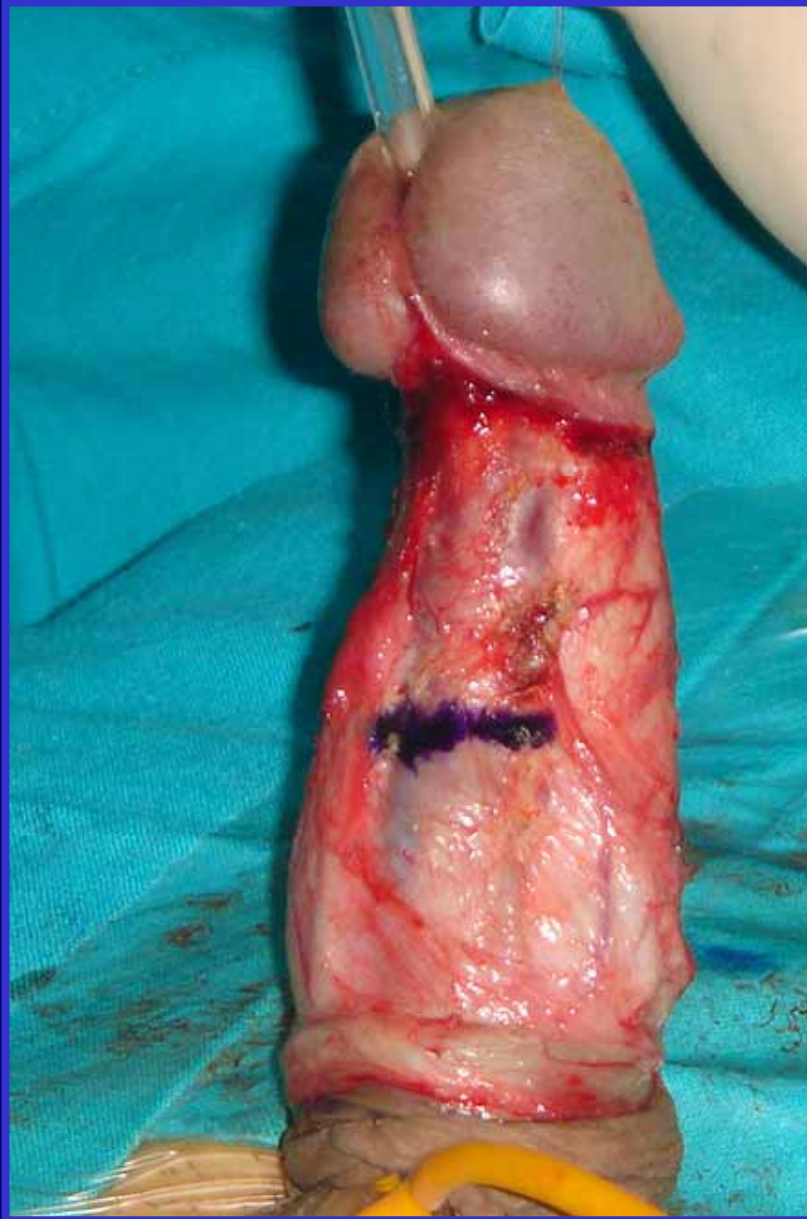
sacculation



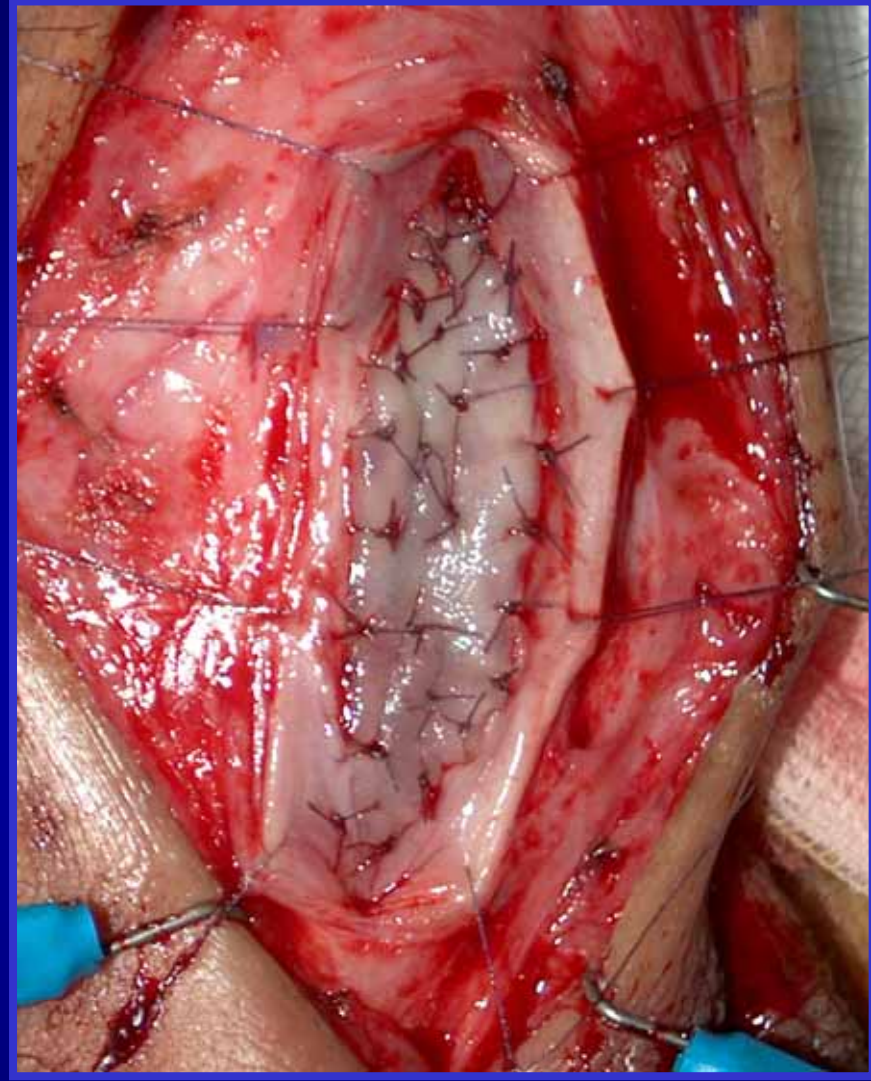
# One-stage dorsal inlay oral mucosal graft urethroplasty















# Complications following graft urethroplasty



**infection**



**meatal stenosis**



**fistula**



# In patients with penile urethral strictures due to:



**failed hypospadias  
repair**



**lichen sclerosus**

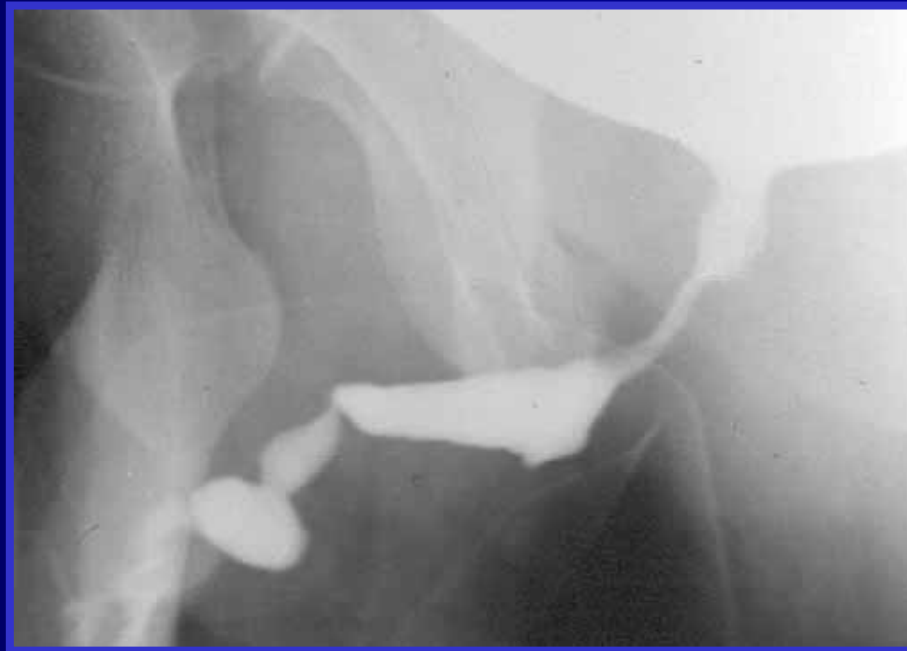


**penis is abnormal**

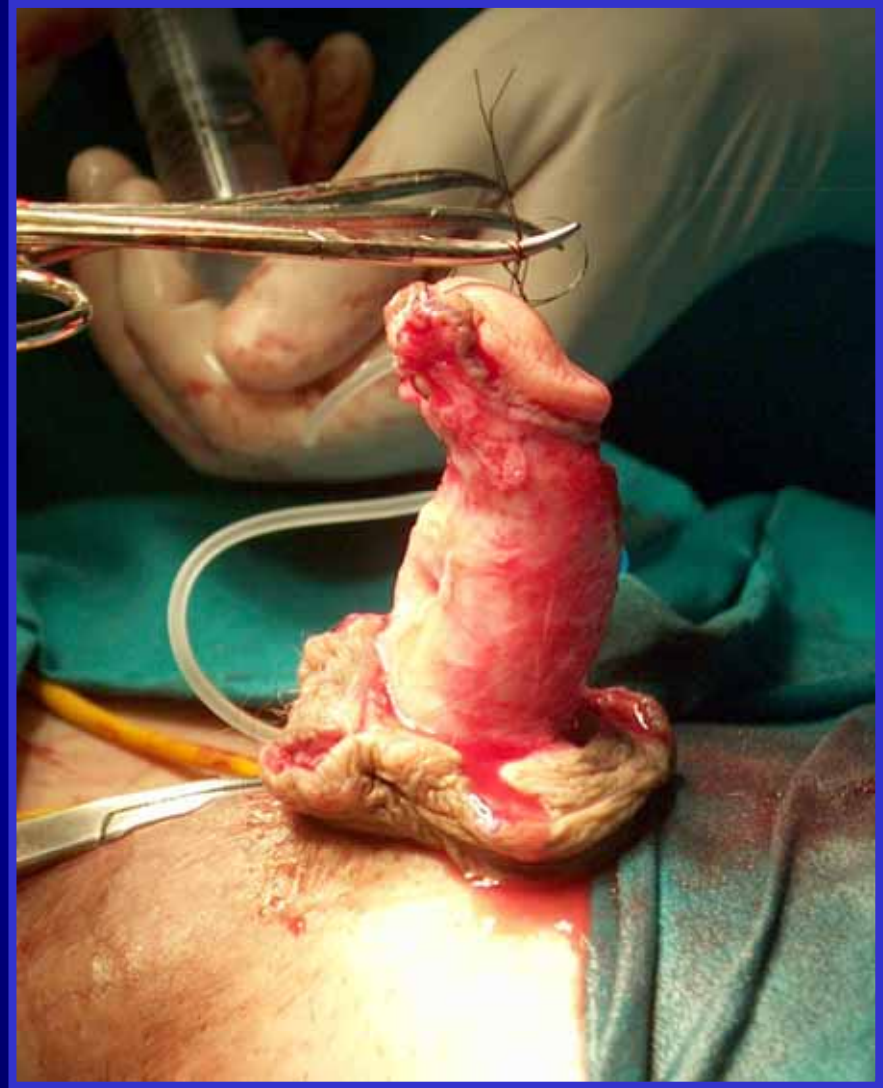
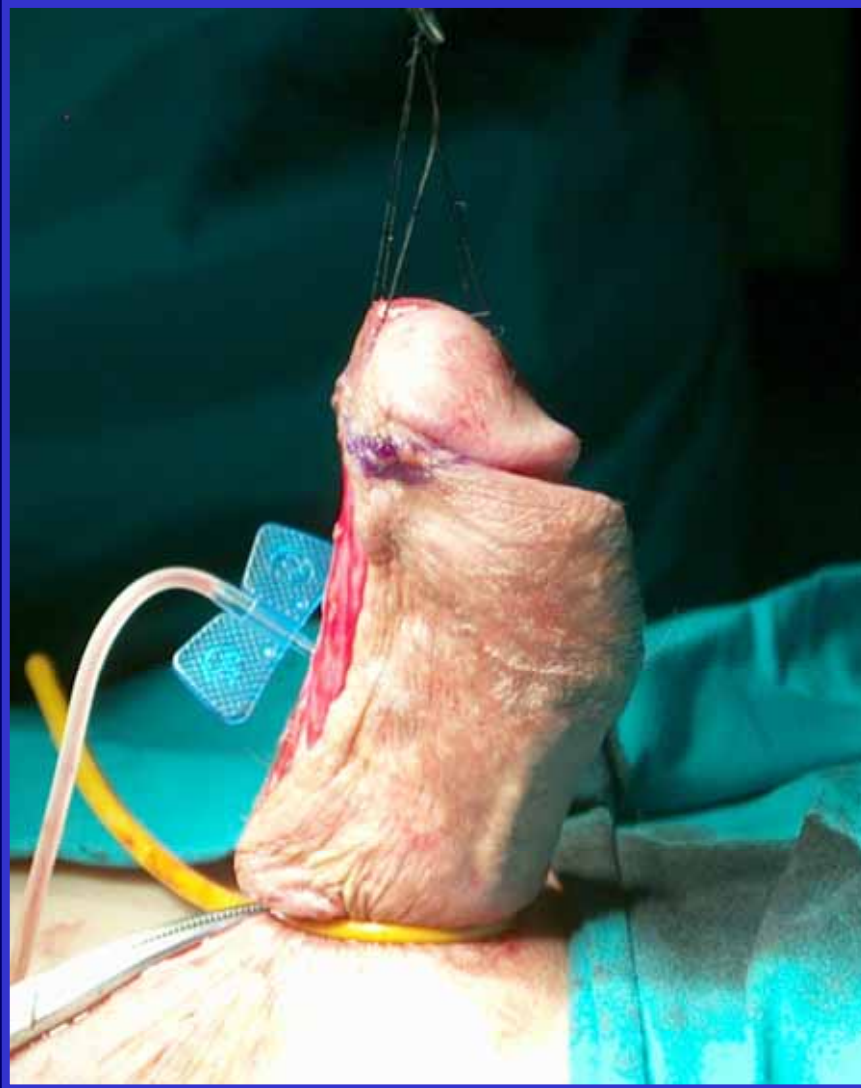




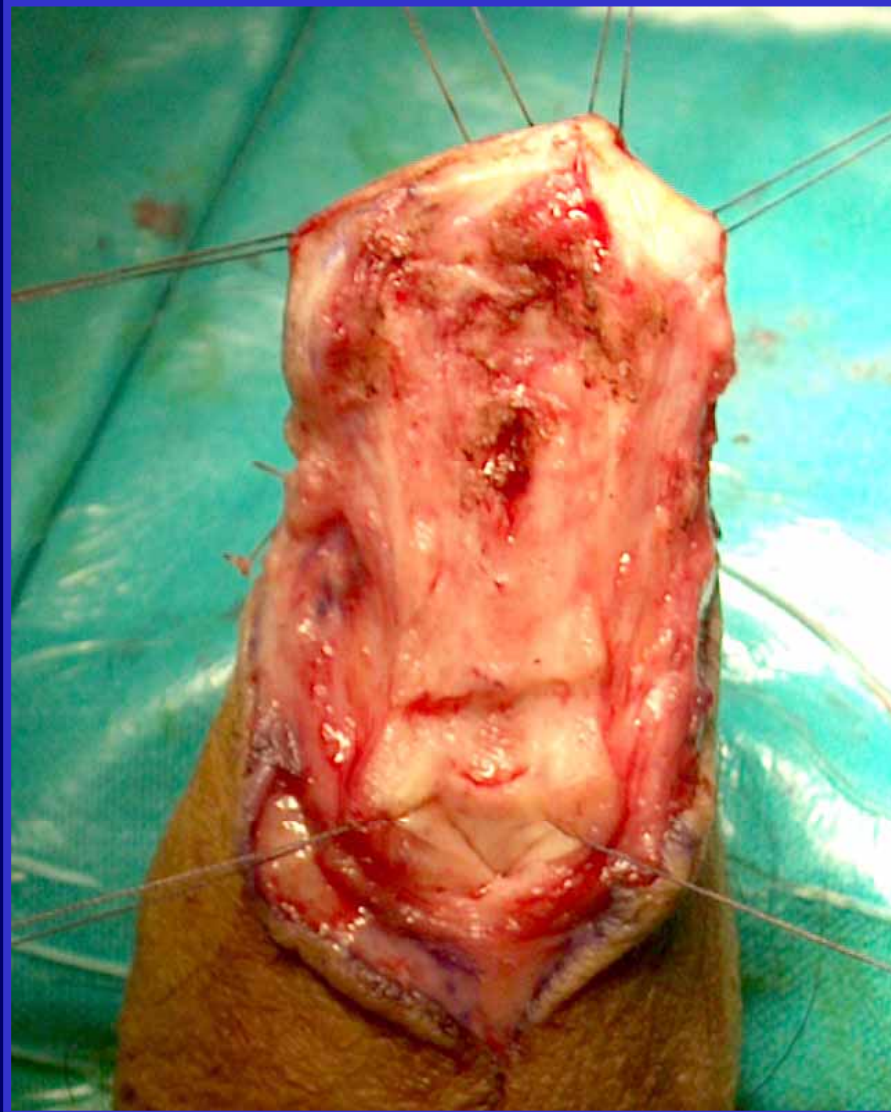
# Two-stage urethroplasty using oral mucosal graft



# First stage











# 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**





## Second stage









# Complications following the second stage of urethroplasty



**fistula**



**glans dehiscence**



**meatal stenosis**

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

**Barbagli et al., Eur Urol, 2006**



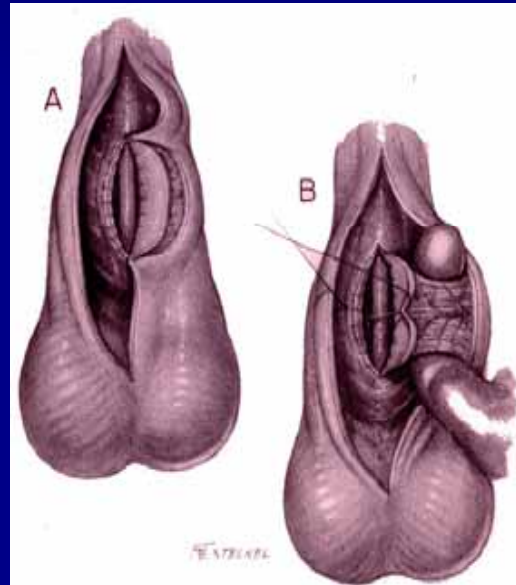
# Evaluation of the results

- 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





# Results



ORANDI

Success rate of the **Orandi-flap urethroplasty** in patients with penile urethral strictures not related with lichen sclerosus or failed hypospadias repair



authors	journal year	N. patients	success rate %
<b>Orandi</b>	<b>Br J Urol 1968</b>	<b>10</b>	<b>90 %</b>
<b>Webster et al</b>	<b>J Urol 1985</b>	<b>6</b>	<b>83.3 %</b>
<b>Webster et al</b>	<b>J Urol 1985</b>	<b>8</b>	<b>87.5 %</b>
<b>de la Rosette et al</b>	<b>J Urol 1991</b>	<b>26</b>	<b>80 %</b>
<b>Greenwell et al</b>	<b>BJU Int 1999</b>	<b>8</b>	<b>87.5 %</b>
<b>Joseph et al</b>	<b>J Urol 2002</b>	<b>4</b>	<b>75 %</b>
<b>Joseph et al</b>	<b>J Urol 2003</b>	<b>20</b>	<b>95 %</b>

# One-stage penile flap or graft urethroplasty

## Results

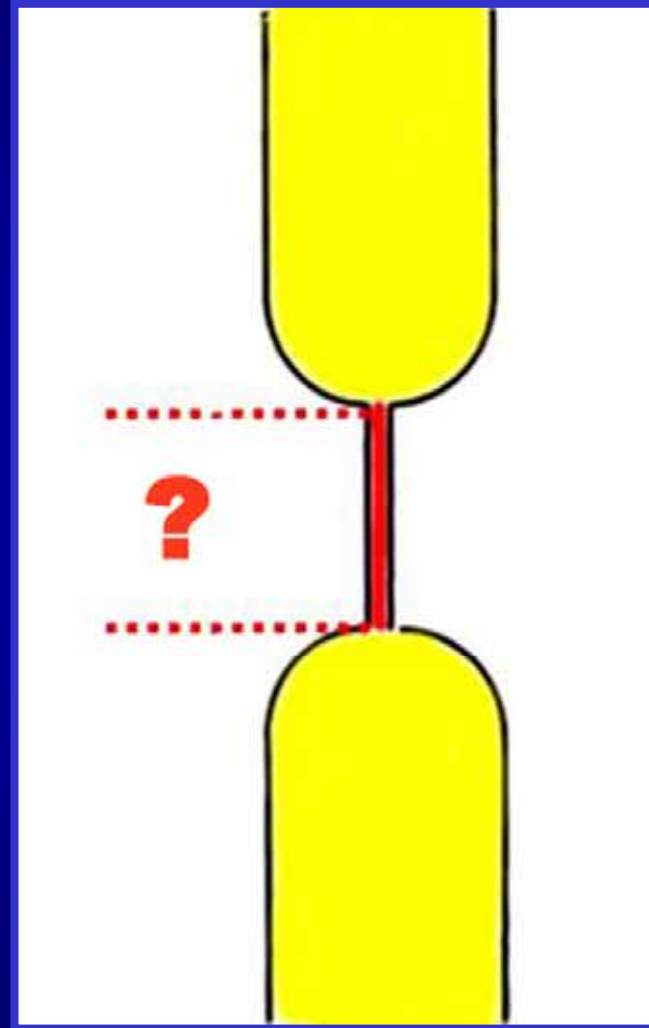
patients	type of repair	success
18	flap	66.7%
15	oral graft	78.6%
17	skin graft	70.6%

[www.urethralcenter.it](http://www.urethralcenter.it)



# Bulbar urethroplasty

Which type of  
urethroplasty ?



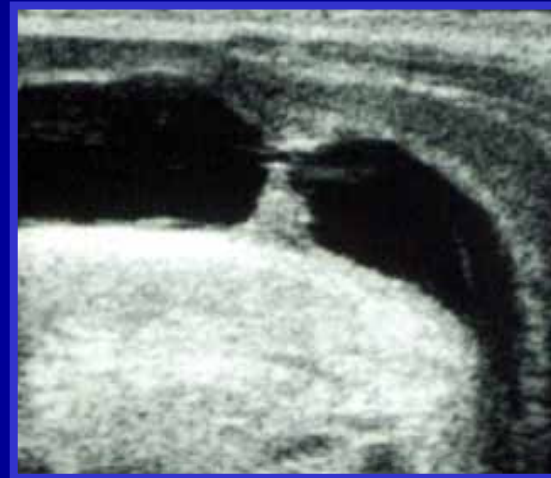
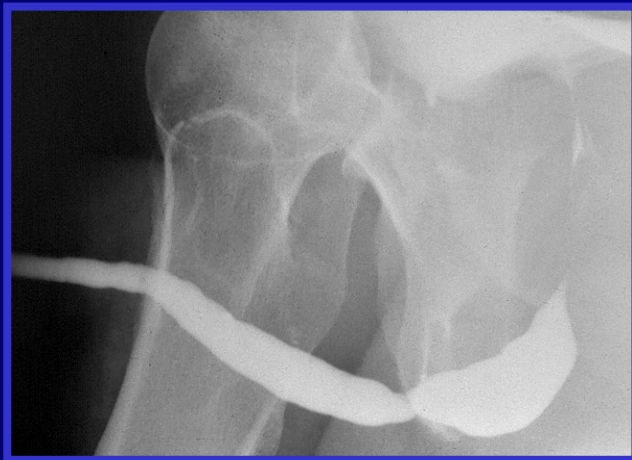
# Bulbar urethroplasty

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 ?

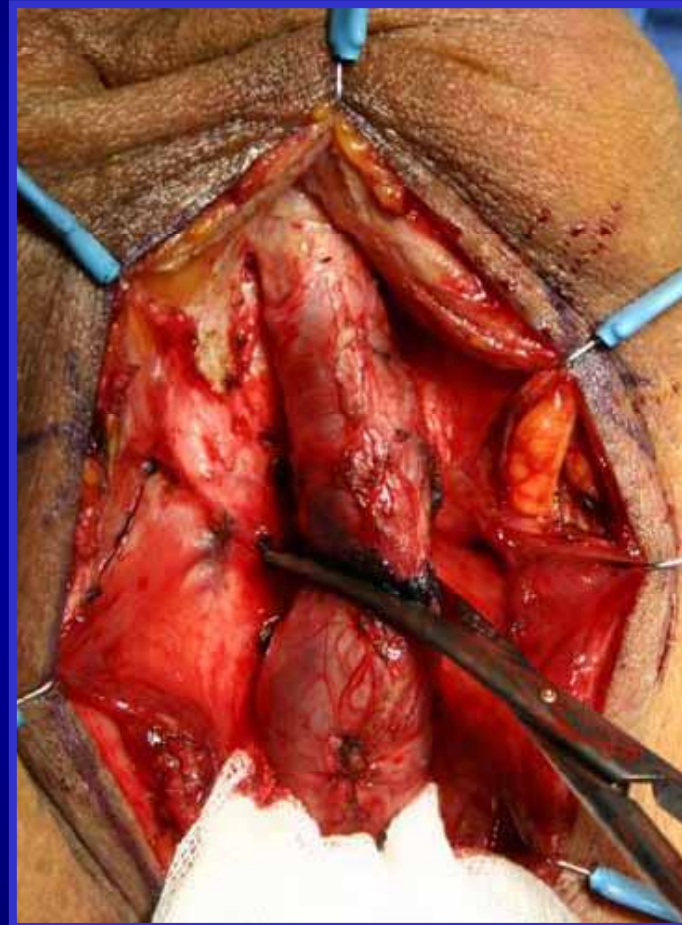
patients	type of repair	success	complications *
28	end-to-end	26 ( 83% )	18%
19	oral graft	19 ( 100% )	0

\* penile chordee or erectile dysfunction

Al-Qudah et al., J Urol, 2006



**To transect or no  
transect the urethra ?  
This is the question !**



# Augmented anastomotic repair

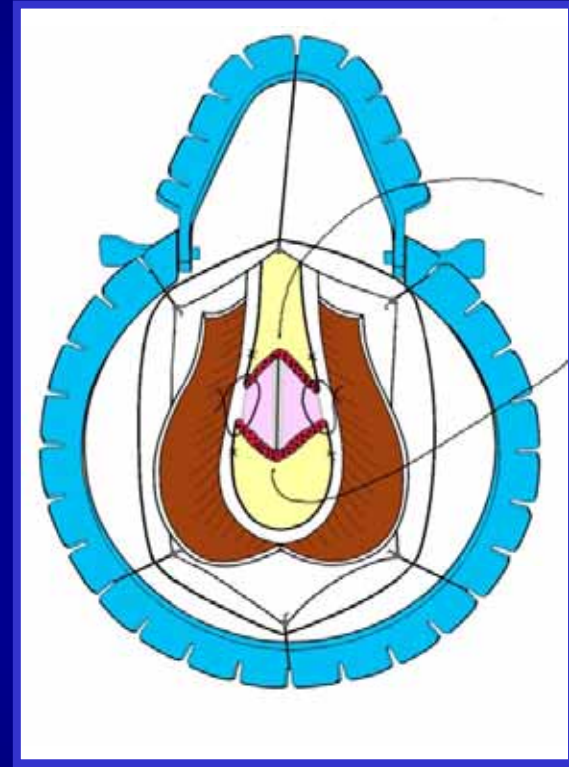
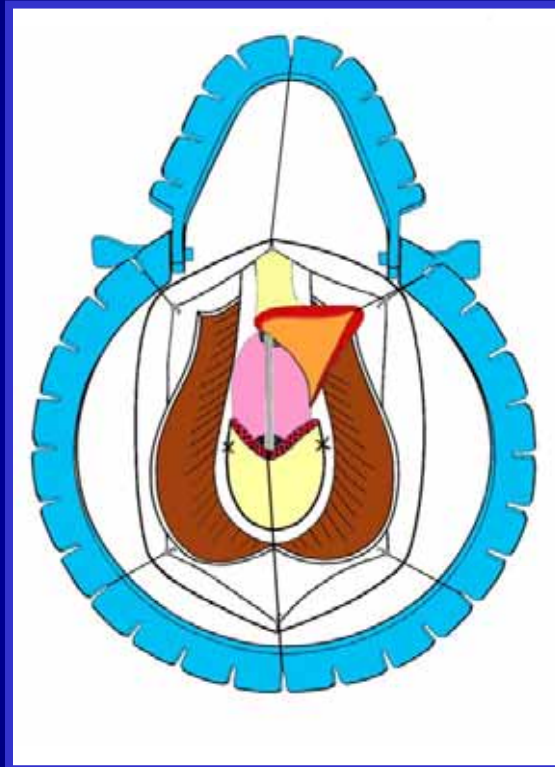
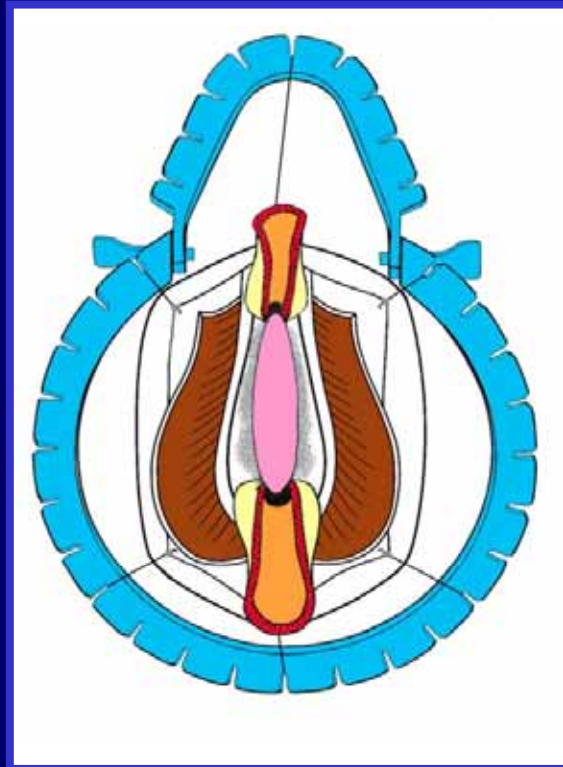


Urethral stricture ranging from 2 to 4 cm





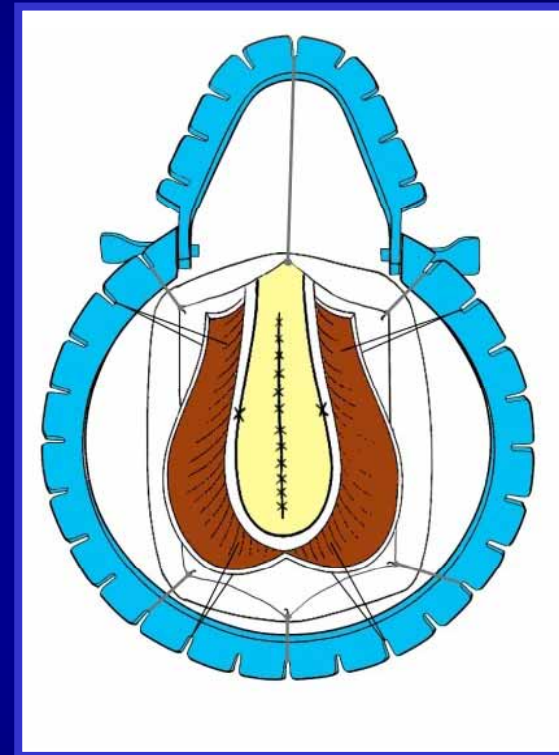
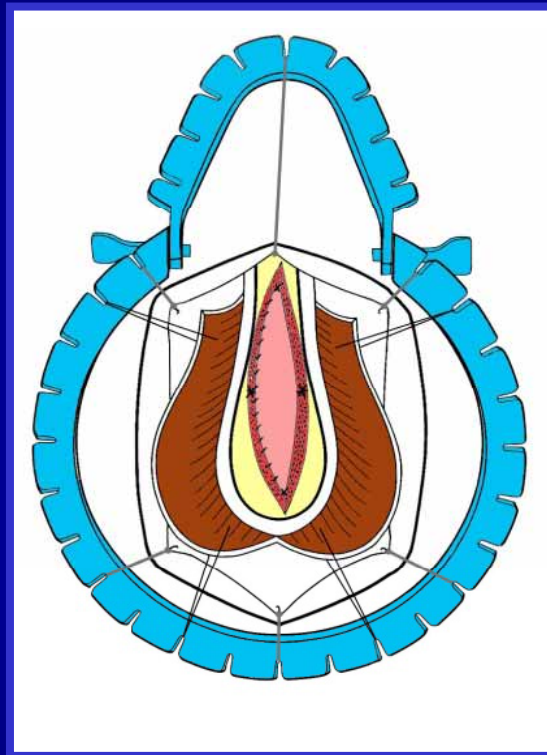
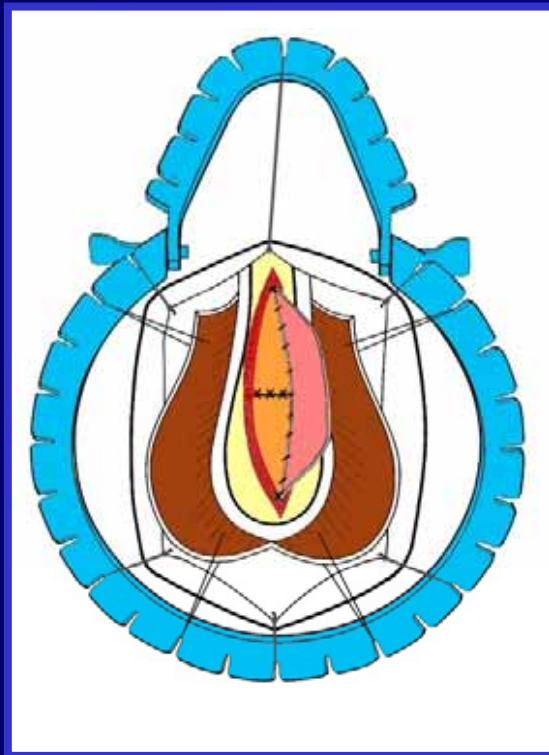
# Augmented anastomotic repair



Dorsal roof-strip



# Augmented anastomotic repair



Ventral floor-strip



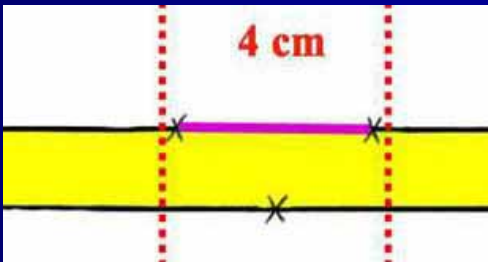
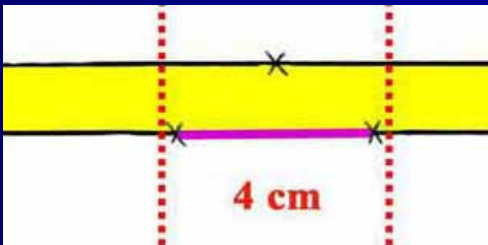
# Augmented anastomotic repair

## Results

authors	type of repair	success
Guralnick et al.	dorsal OMG	93 %
Abouassaly et al.	dorsal or ventral OMG	90 %
El-Kassaby et al.	ventral OMG	93 %

# Augmented anastomotic repair

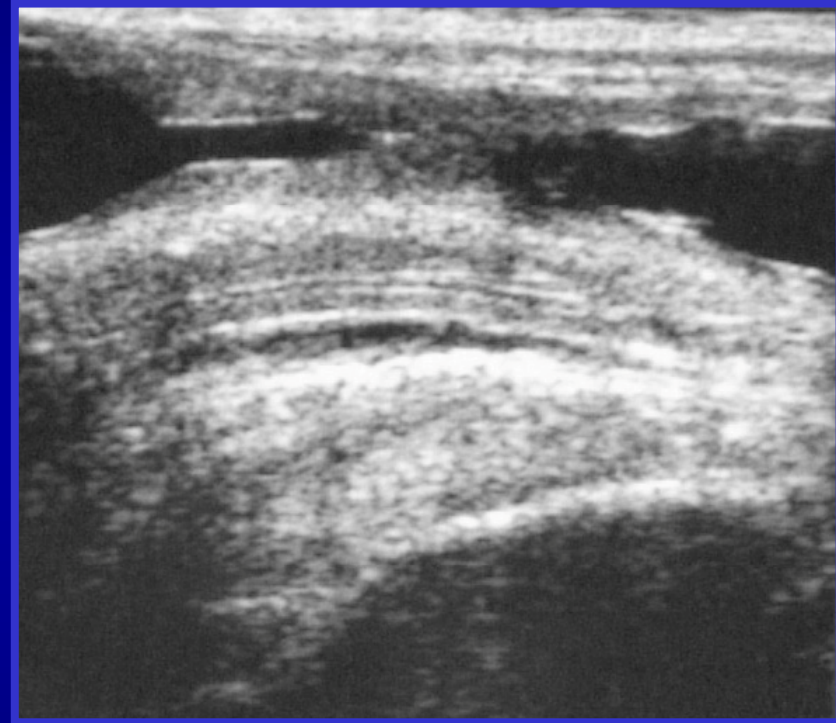
## Results

type of repair		success
 A schematic diagram of a dorsal onlay microvascular graft (OMG) repair. It shows a horizontal line representing the urethra with a central gap. A yellow rectangular patch is placed over the gap. Two vertical dashed red lines are positioned on either side of the patch, with a red '4 cm' label between them. 'X' marks indicate the anastomotic sites.	dorsal OMG	79 %
	dorsal skin graft	33 %
 A schematic diagram of a ventral onlay microvascular graft (OMG) repair. It shows a horizontal line representing the urethra with a central gap. A yellow rectangular patch is placed over the gap. Two vertical dashed red lines are positioned on either side of the patch, with a red '4 cm' label between them. 'X' marks indicate the anastomotic sites.	ventral OMG	28 %

[www.urethralcenter.it](http://www.urethralcenter.it)



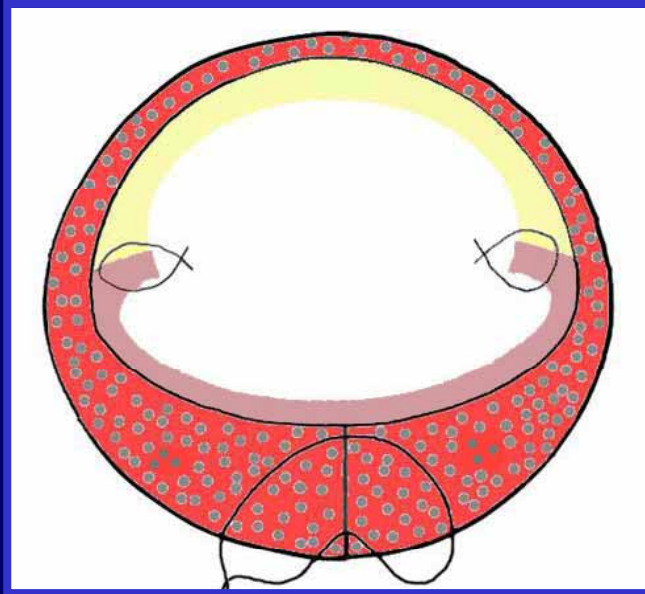
# Substitution urethroplasty



**Urethral stricture more than 4 cm in length**

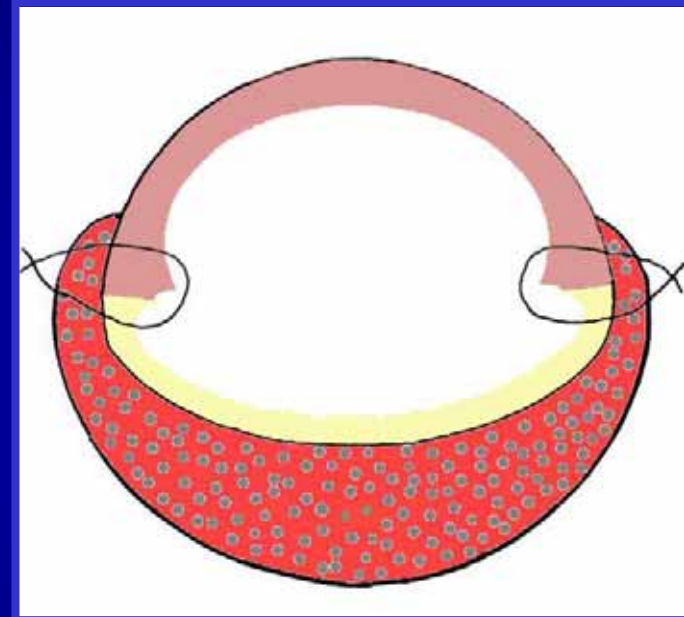


# Which type of substitution urethroplasty



**ventral**

?



**dorsal**



# Dorsal onlay graft urethroplasty

## published results

authors	patients	mean follow-up	success rate
Iselin et al. J Urol 1999	12	19	100%
Andrich et al. B J U Int 2001	42	60	88%
Delvecchio et al. J Urol 2004	11	\	90%

# Ventral onlay graft urethroplasty

## published results

authors	patients	mean follow-up	success rate
Kane et al. J Urol 2002	53	25	94%
Elliot et al. J Urol 2003	60	47	90%
Kellner et al. J Urol 2004	18	50	88%



---

## 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?

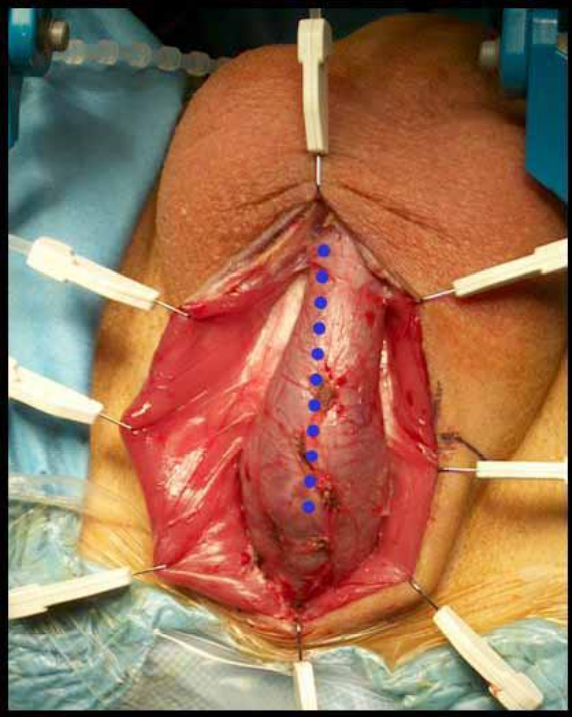
GUIDO BARBAGLI, ENZO PALMINTERI, GIORGIO GUAZZONI, FRANCESCO MONTORSI,  
DAMIANO TURINI AND MASSIMO LAZZERI\*

*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), Cefalù, Italy*

**J Urol 2005**

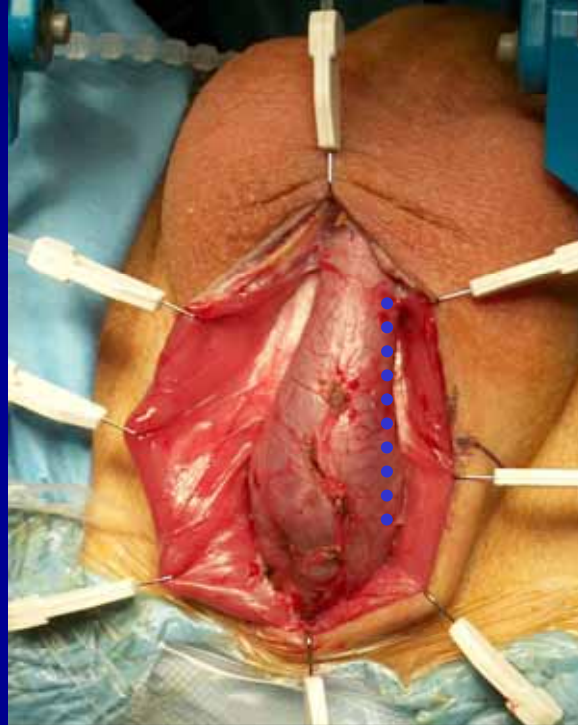


# Results



**Ventral**

83% success



**Lateral**

83% success



**Dorsal**

85% success



# Substitution urethroplasty

## Results

( up-to dated at December 31, 2007)

type of repair	success
ventral OMG	91 %
lateral OMG	83 %
dorsal OMG	77 %

[www.urethralcenter.it](http://www.urethralcenter.it)



# 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](http://www.urethralcenter.it)**



What can you find in [www.urethralcenter.it](http://www.urethralcenter.it)?

- Up-to-date Information on urethral pathology and surgery
- Everything you need to know about urethral stricture diseases
- How to make a diagnosis
- All the surgical techniques performed at our Center
- An up-to-date database of surgical outcome
- Information and opportunities for "hands-on" training
- Up-to-date literature
- The articles published by Guido Barbagli
- The books published by Guido Barbagli
- The lectures presented by Guido Barbagli at Meetings and Congress
- The history of urethral surgery
- An Atlas of Surgical Techniques
- Video
- Comments and suggestion for the urologists of XXI century
- ... and more!

The website is up-to-date monthly

**This lecture is fully available on our website**

**Thank you !**



**Center for Reconstructive Urethral Surgery**

