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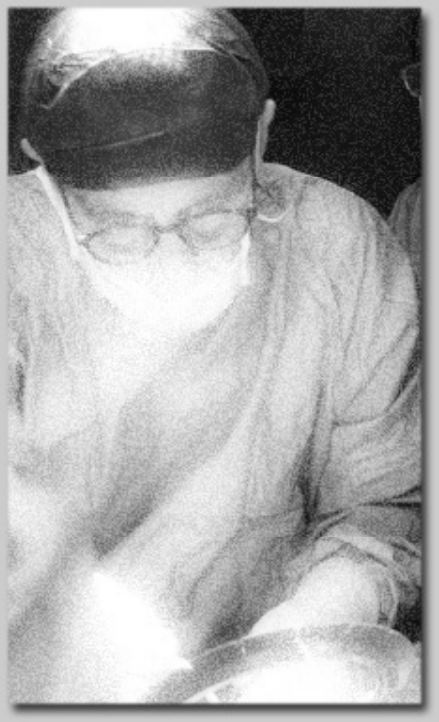

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European Association of Urology

26° Annual EAU Congress

ESU Course 9

Advanced management of urethral stricture disease

Vienna - Austria

March 18 - 22, 2011

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New developments in urethral stricture disease

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New developments in urethral stricture disease:

Surgical techniques

Evaluation of the results

Tissue engineering

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New developments in urethral stricture disease:

Surgical techniques

Muscle- and nerve-sparing bulbar urethroplasty

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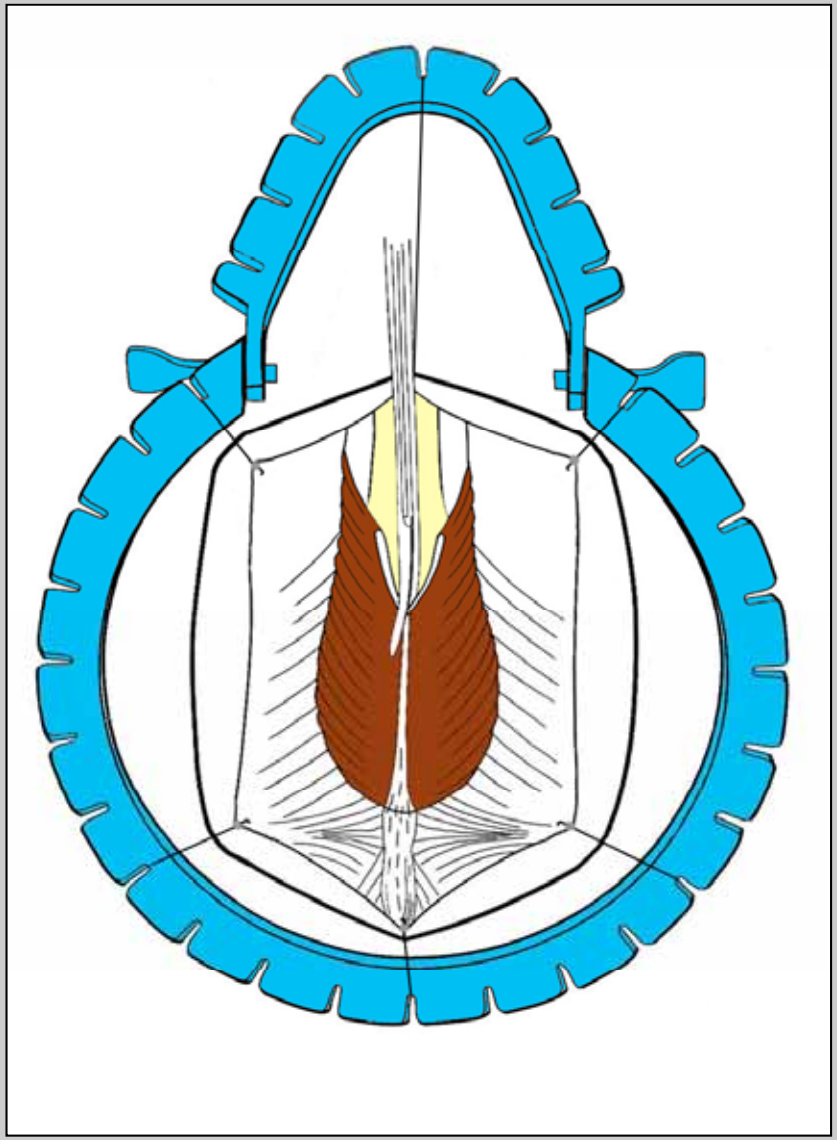

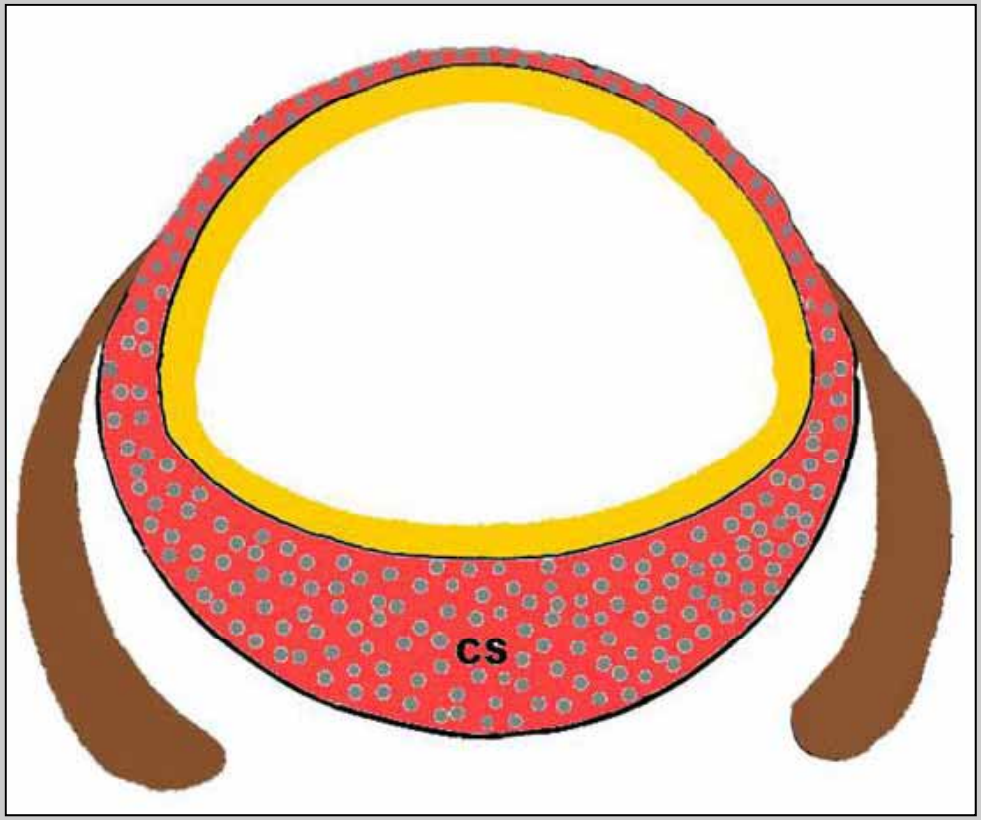

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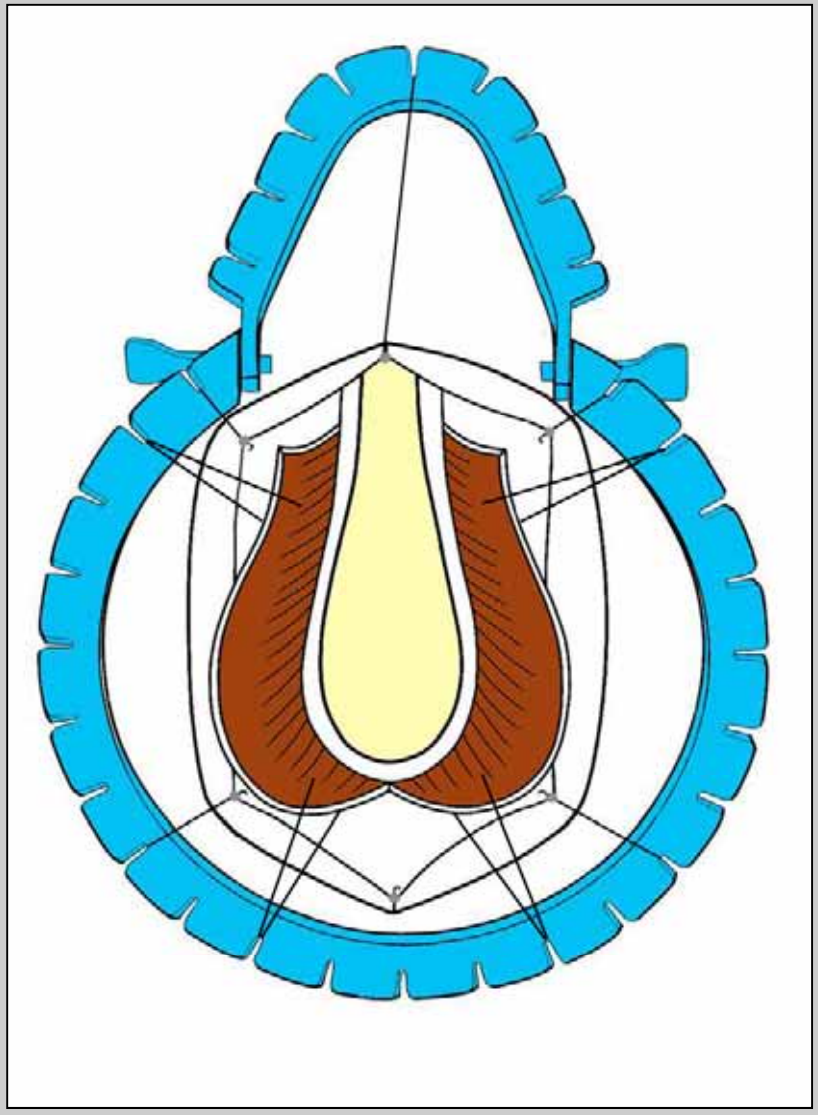

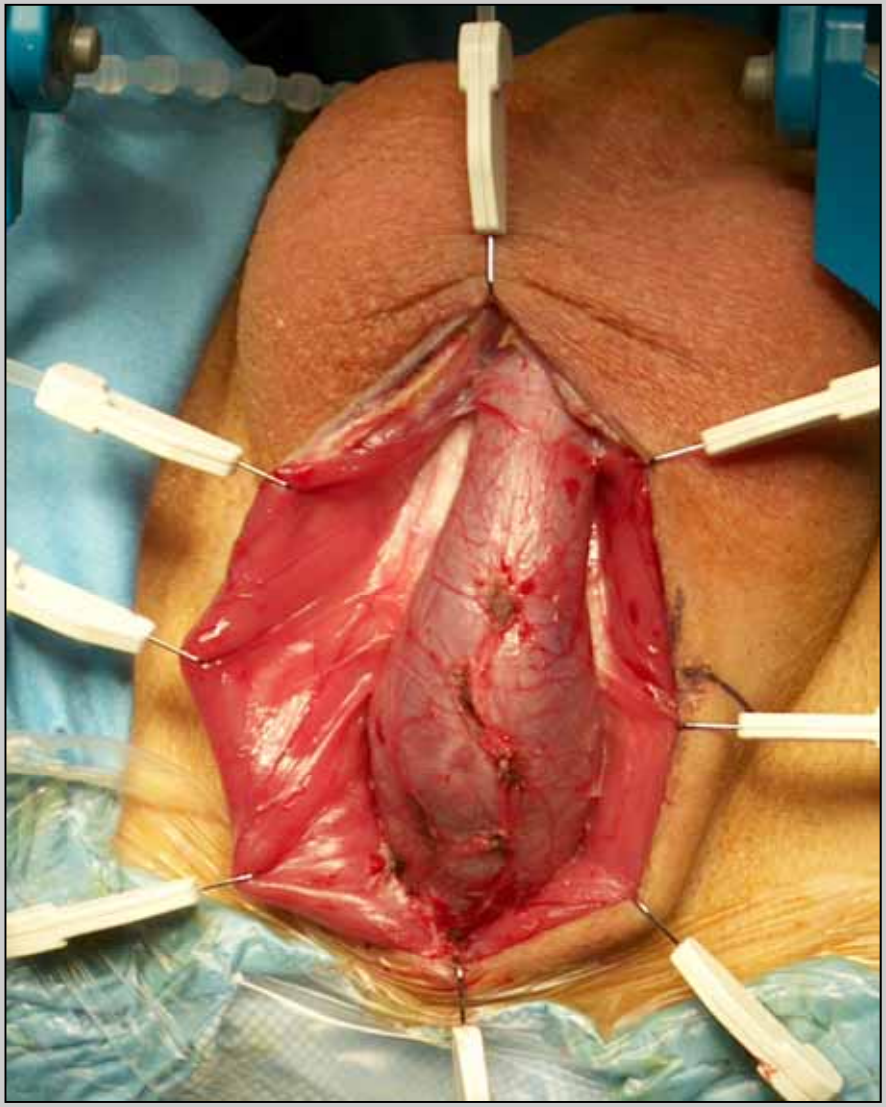

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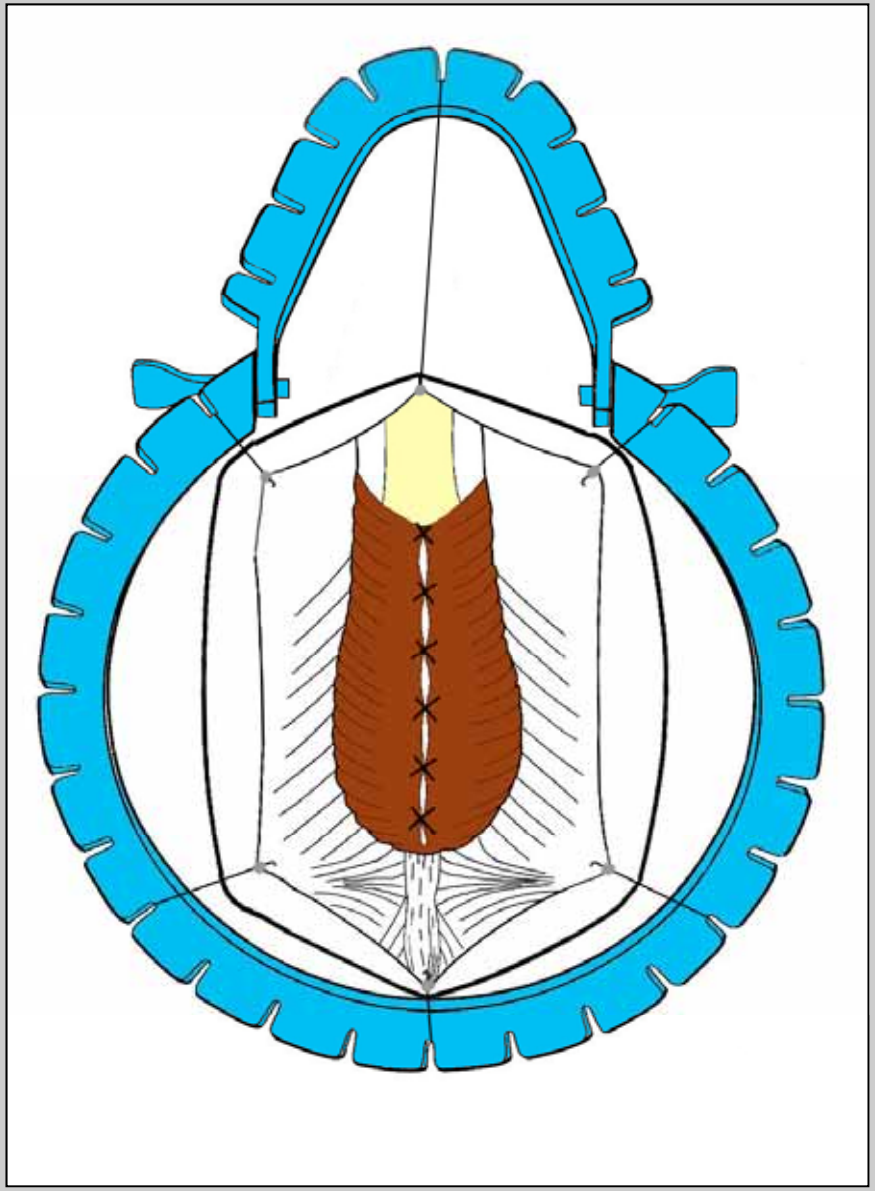

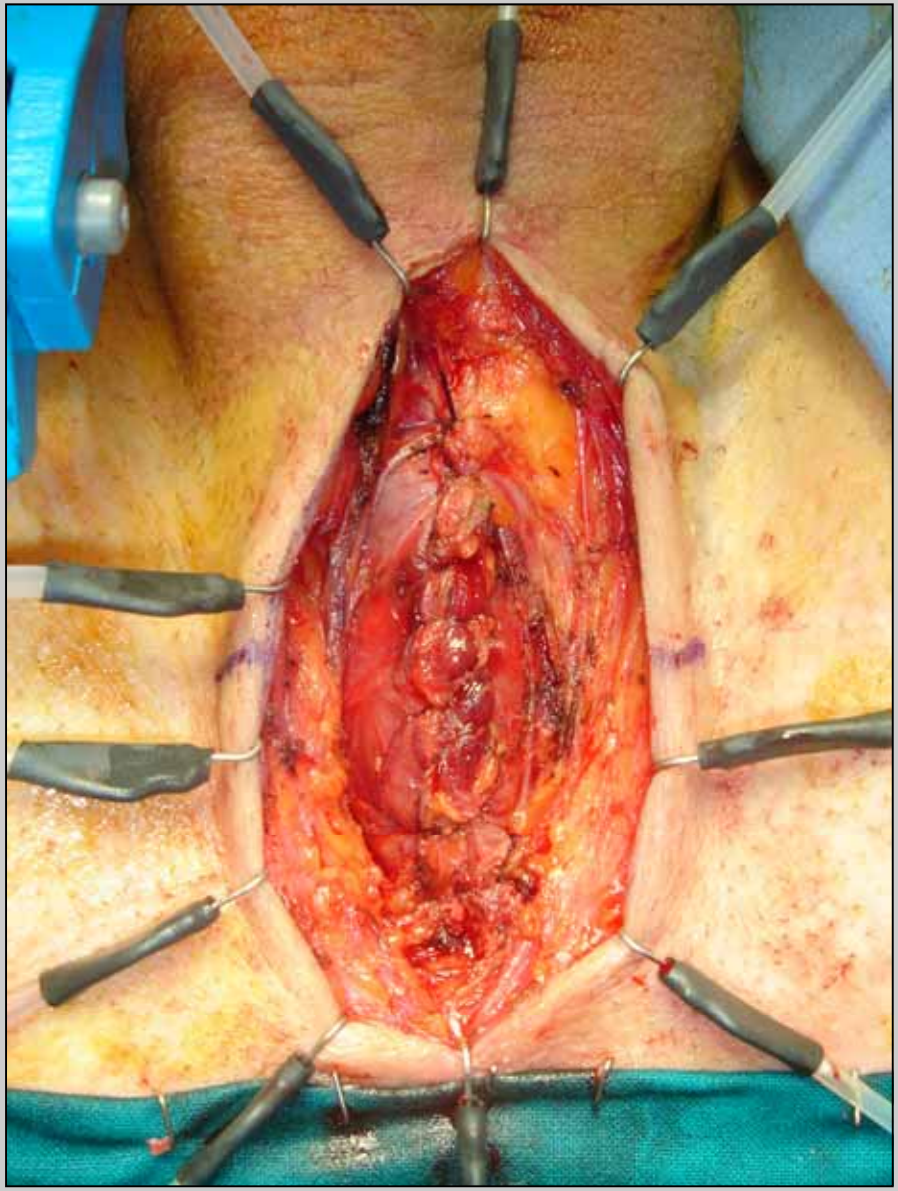

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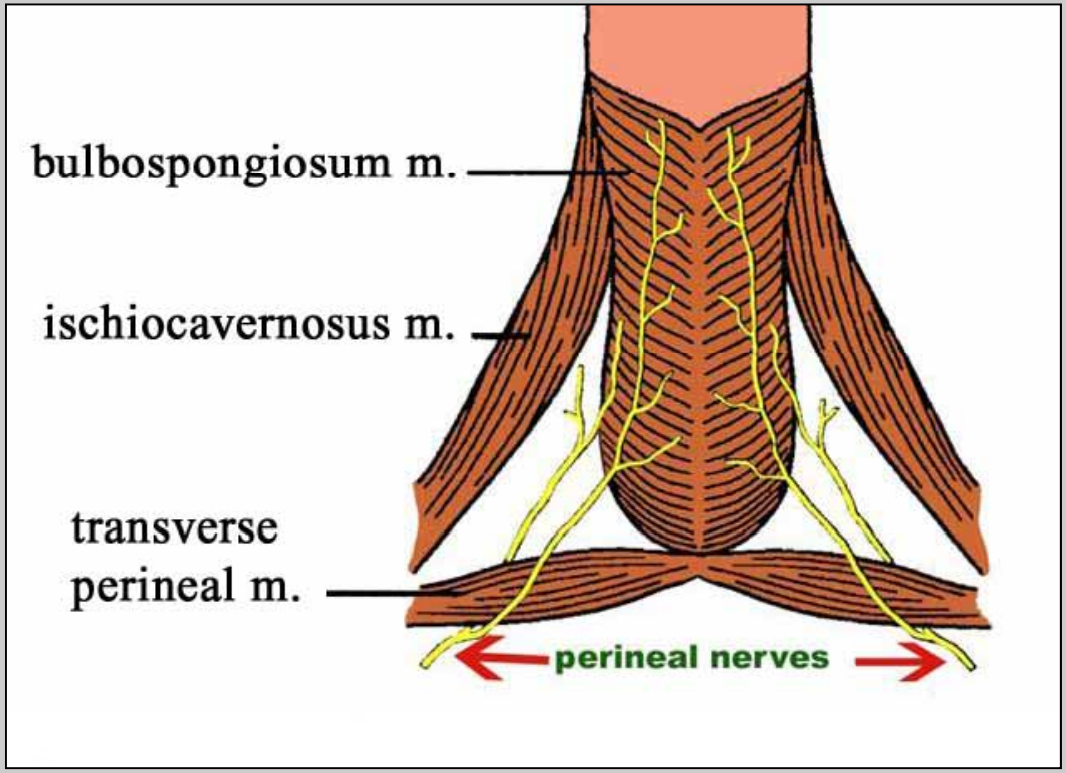
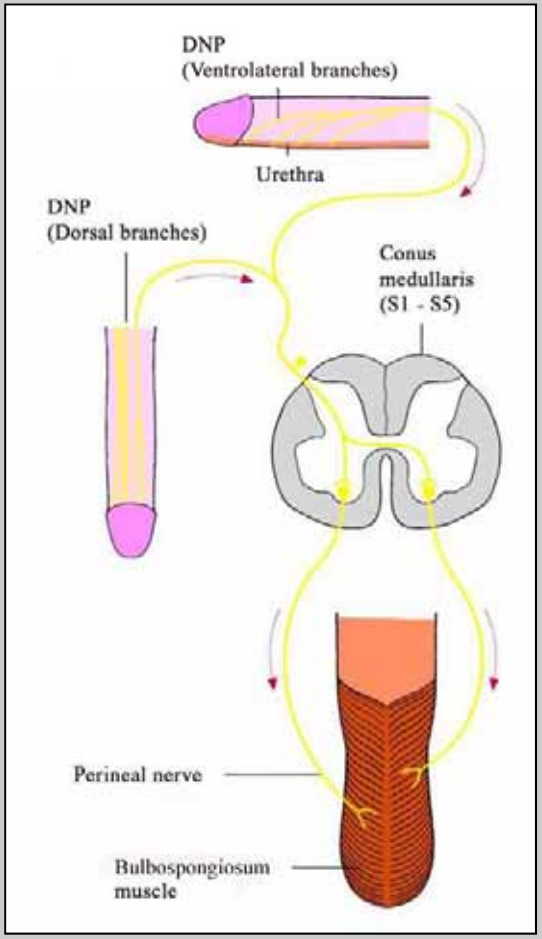
Functional anatomy of bulbospongiosum muscle



Perineal nerves innervate the bulbospongiosum muscle and have fine branches that penetrate the corpus spongiosum.

Yucel and Baskin, BJU International 2003; 92:624-630

Functional anatomy of the bulbospongiosum muscle

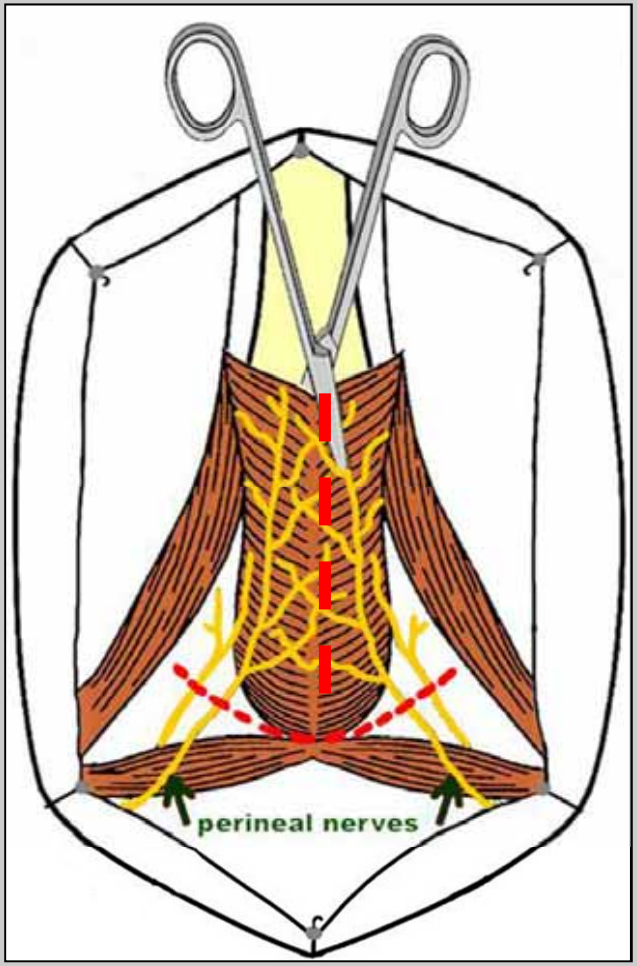


- **Bulbospongiosum muscle contractions are elicited by stimulation of the dorsal nerve of the penis and following stimulation of the perineal nerve.**

- **Rhythmic contractions of the bulbospongiosum muscle expel semen and urine from the urethra, thus avoiding semen and urine sequestration in the urethral bulb.**

Yang and Bradley, BJU International 2000; 85:857-863

Functional anatomy of the bulbospongiusum muscle



- Ejaculatory disorders may result from disruption of one or more of the reflex pathways providing innervation of the bulbospongiosum muscle.

- These disorders may manifest as decreased force of semen expulsion and low semen volume caused by inefficient bulbospongiosum contractility.

Yang and Bradley, BJU International 2000; 85:857-863

Bulbar urethroplasty preserving the bulbospongiosum muscle

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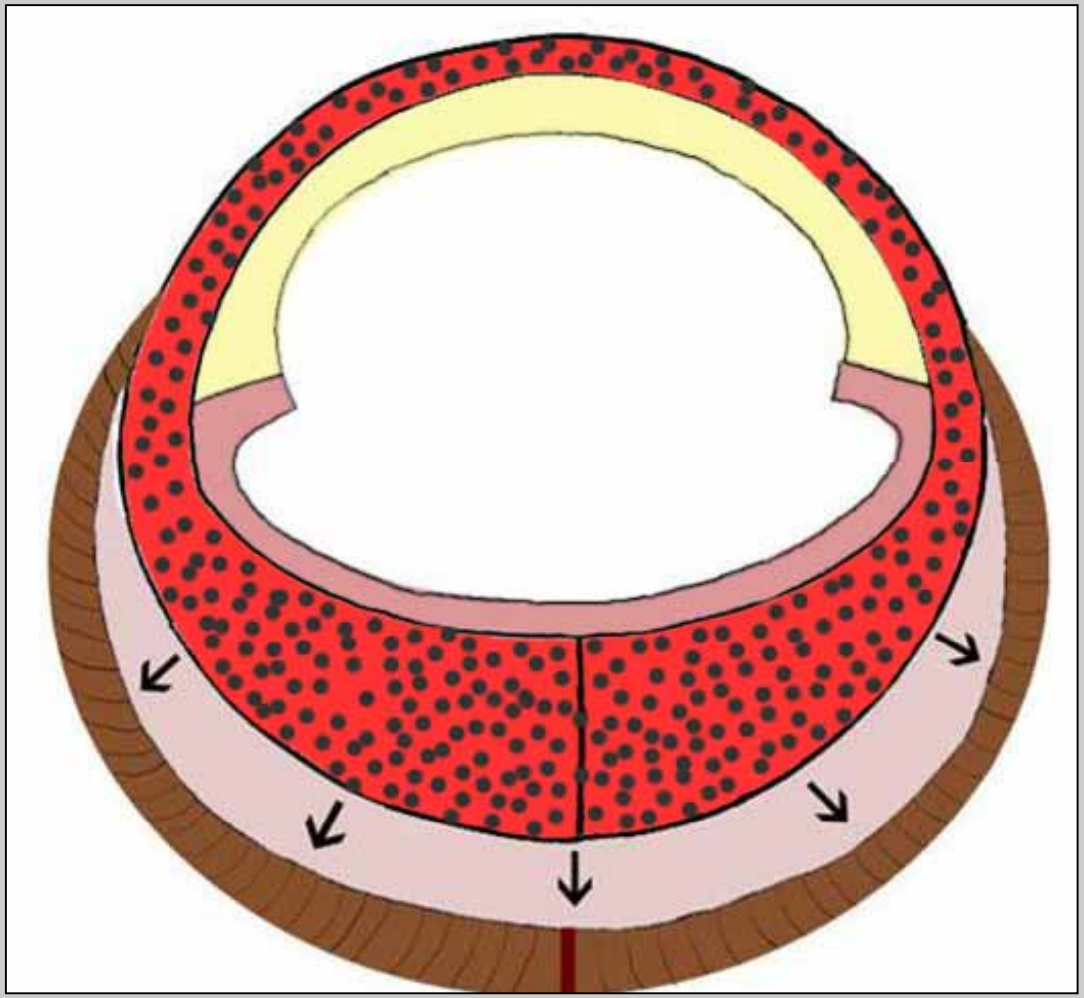
New ventral onlay graft bulbar urethroplasty



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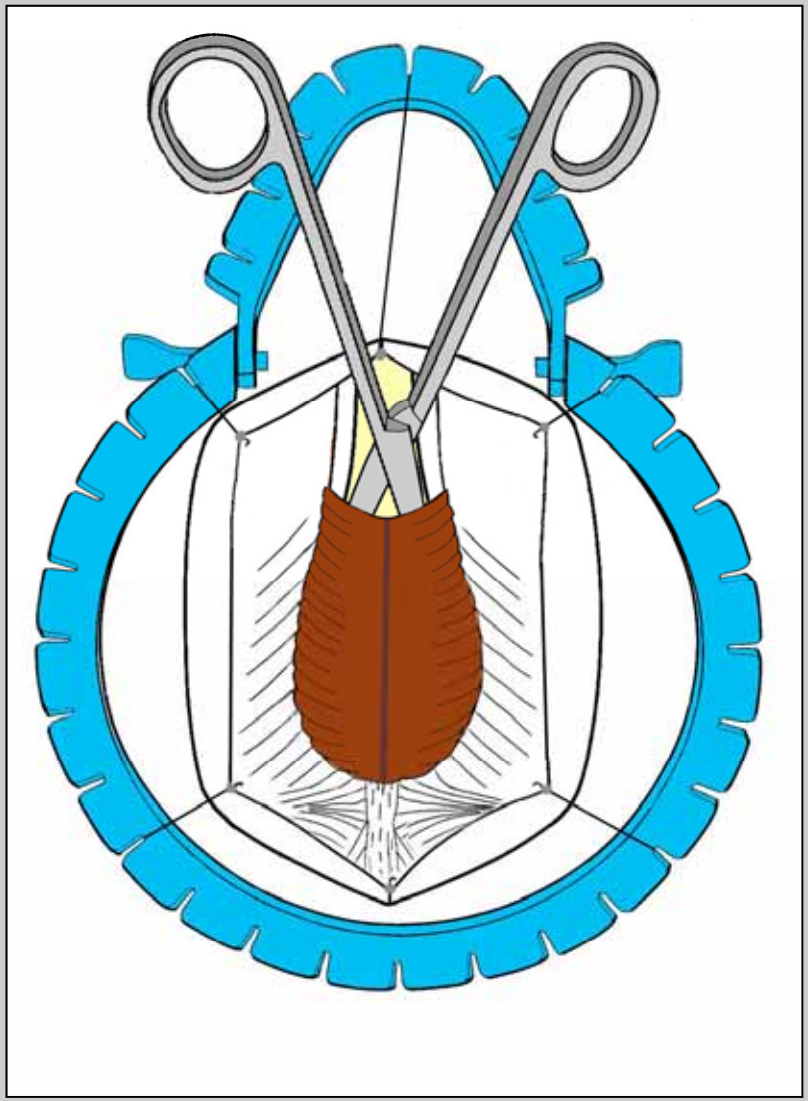

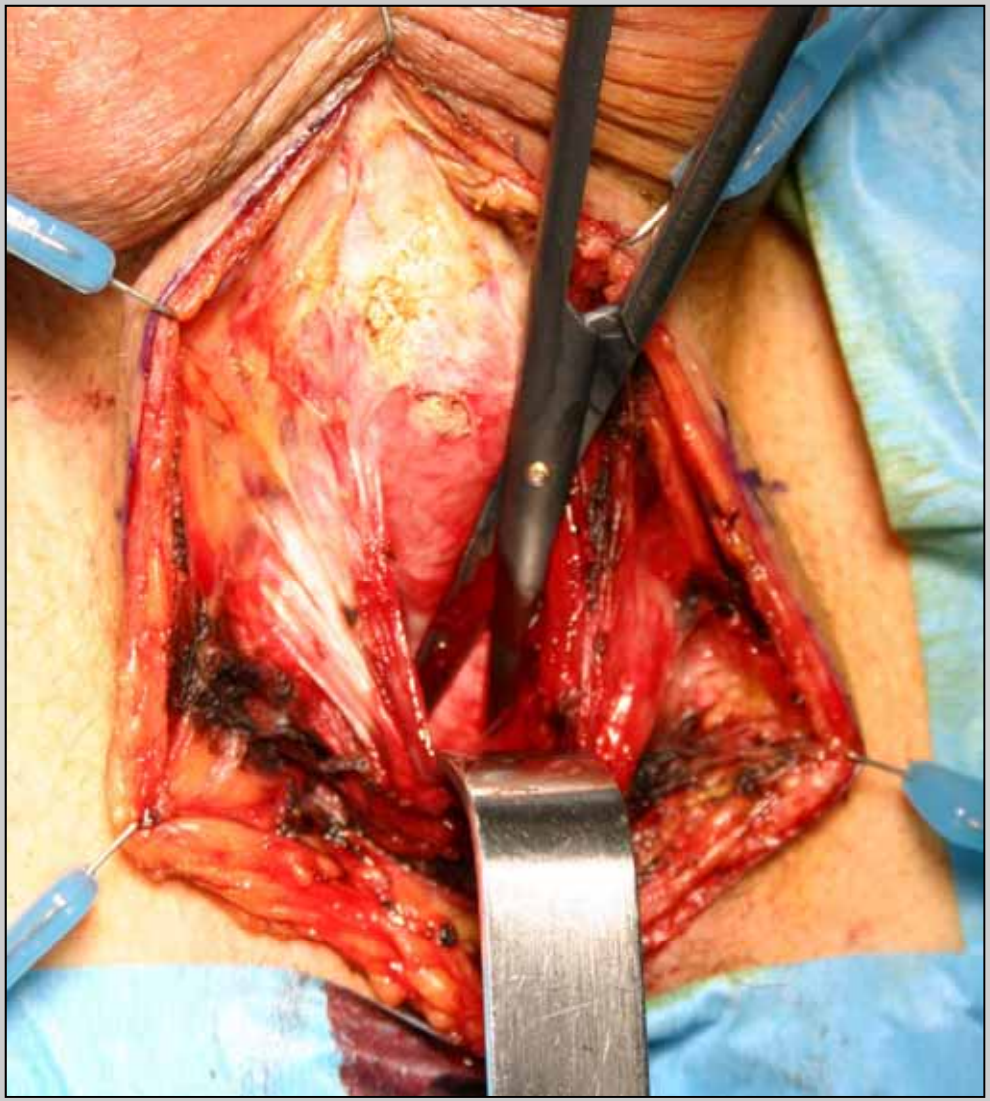

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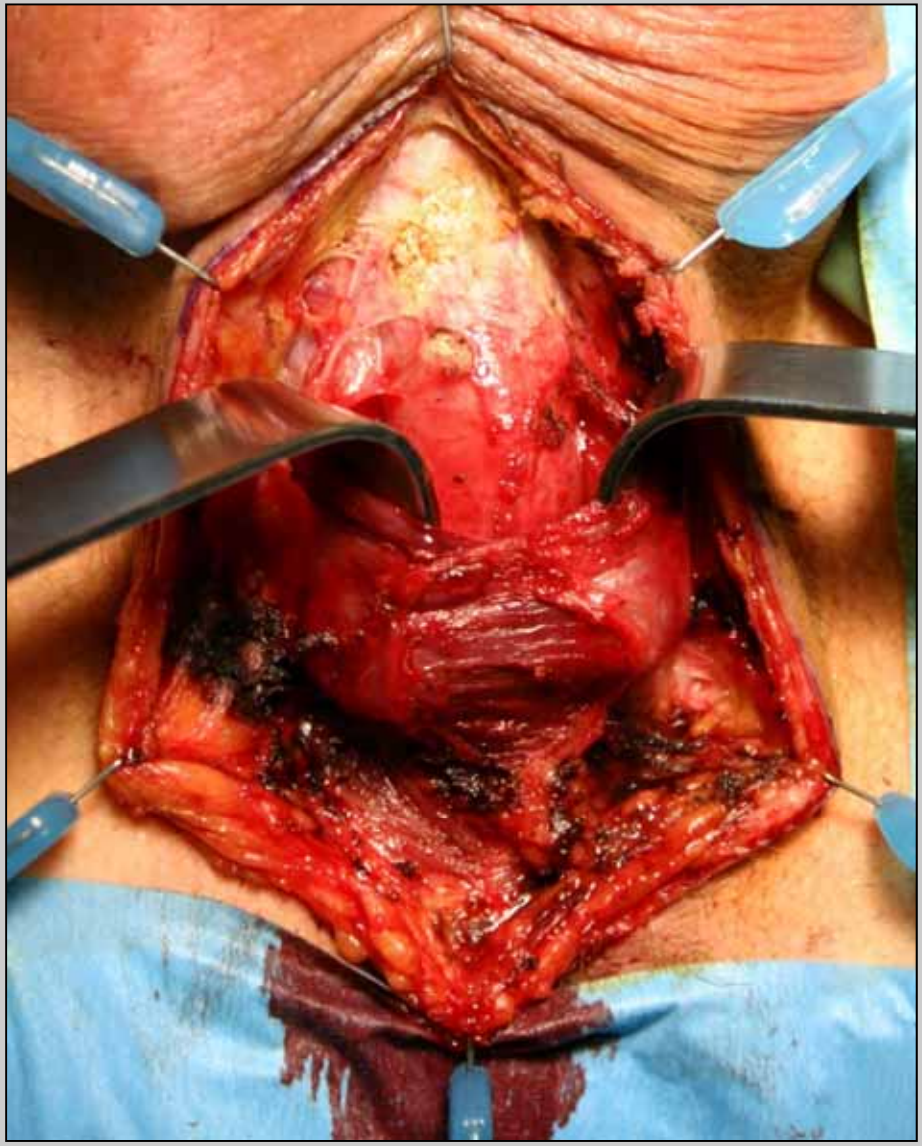

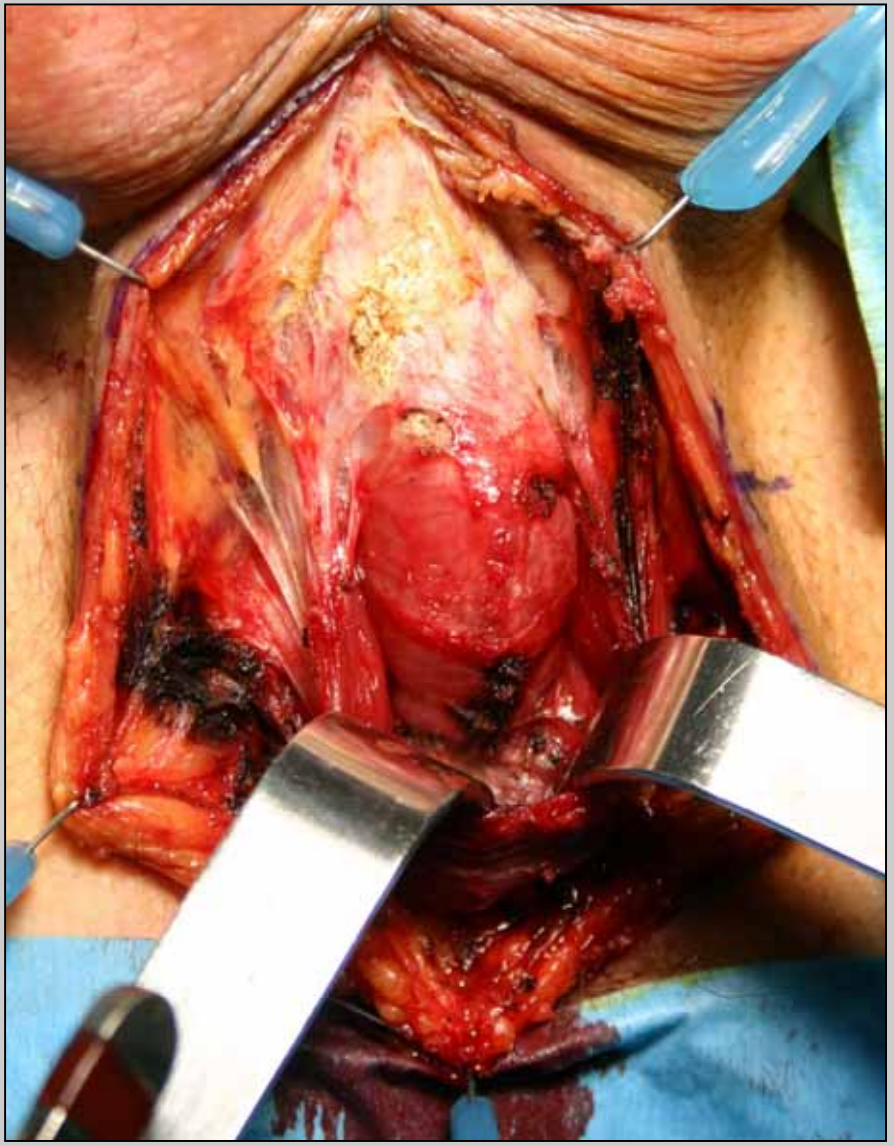

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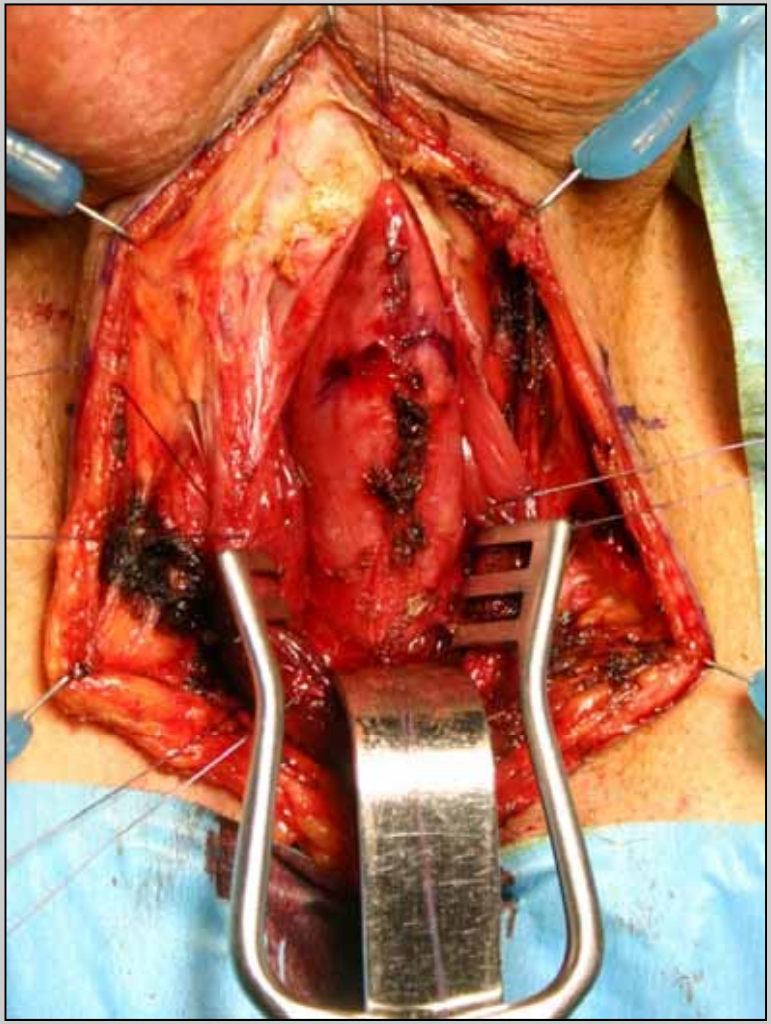

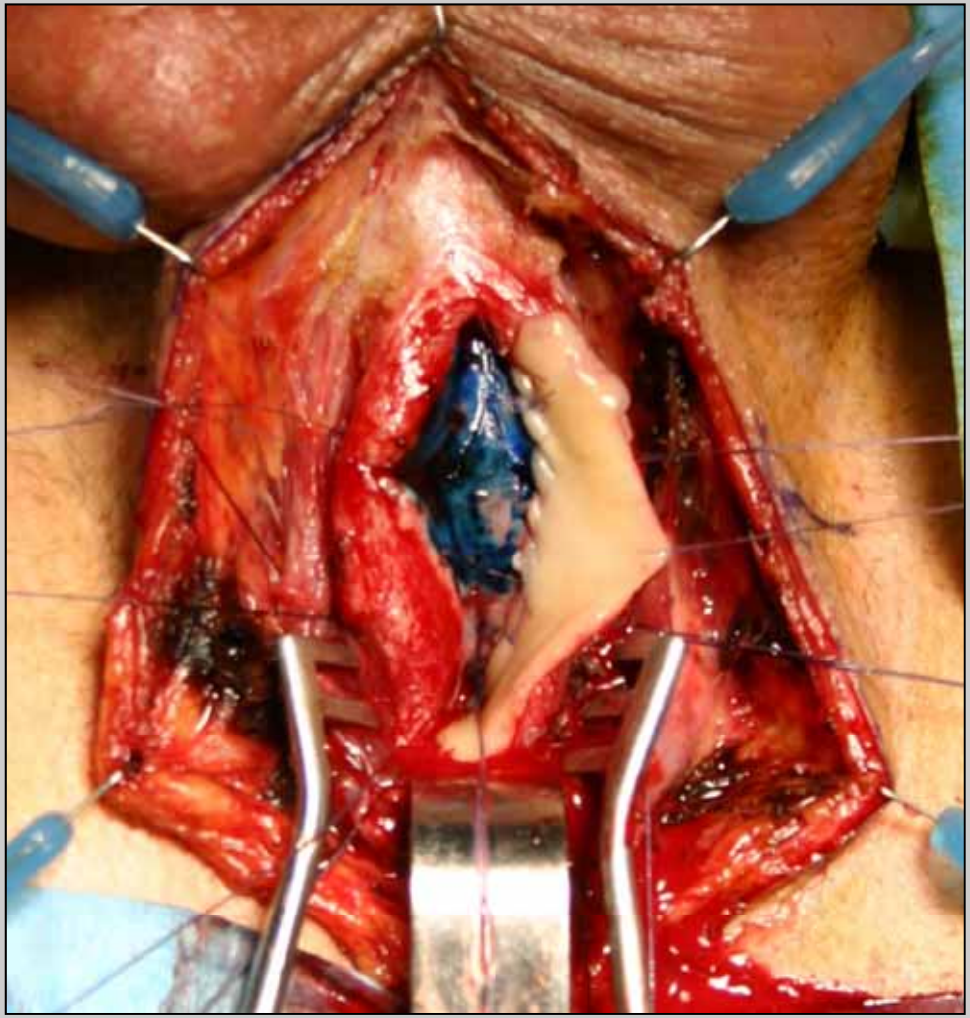

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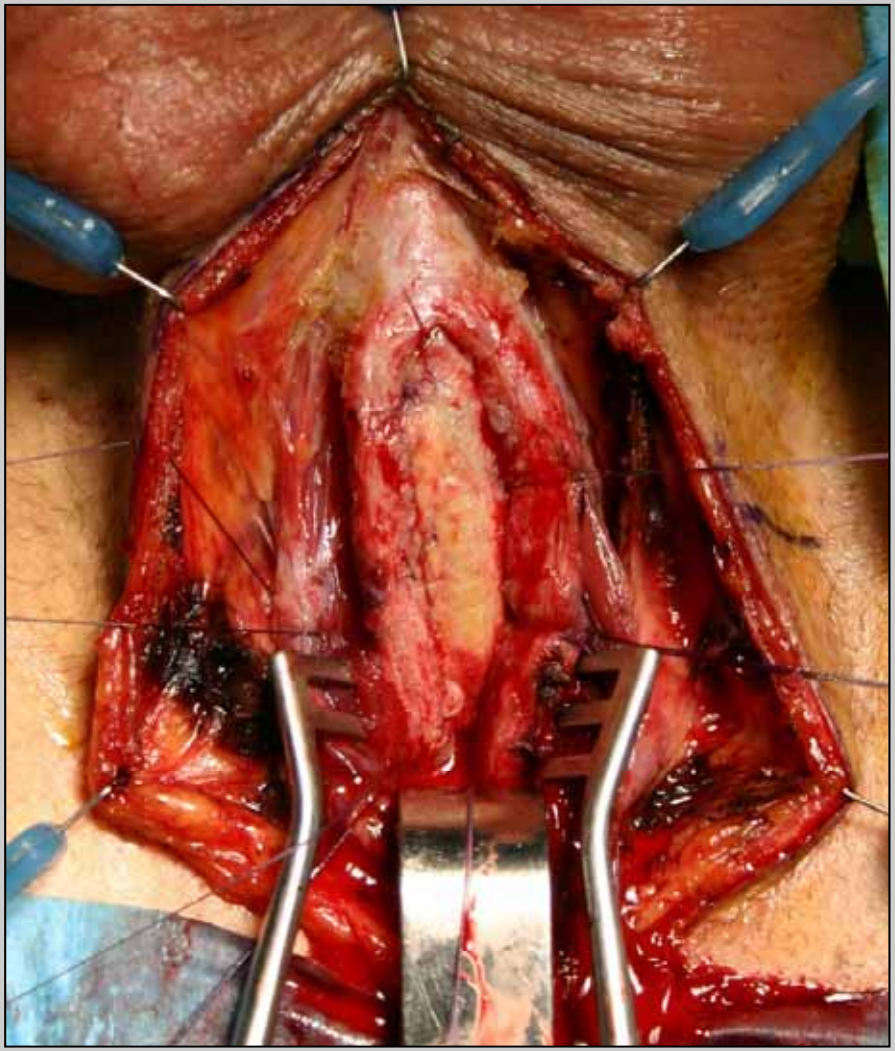

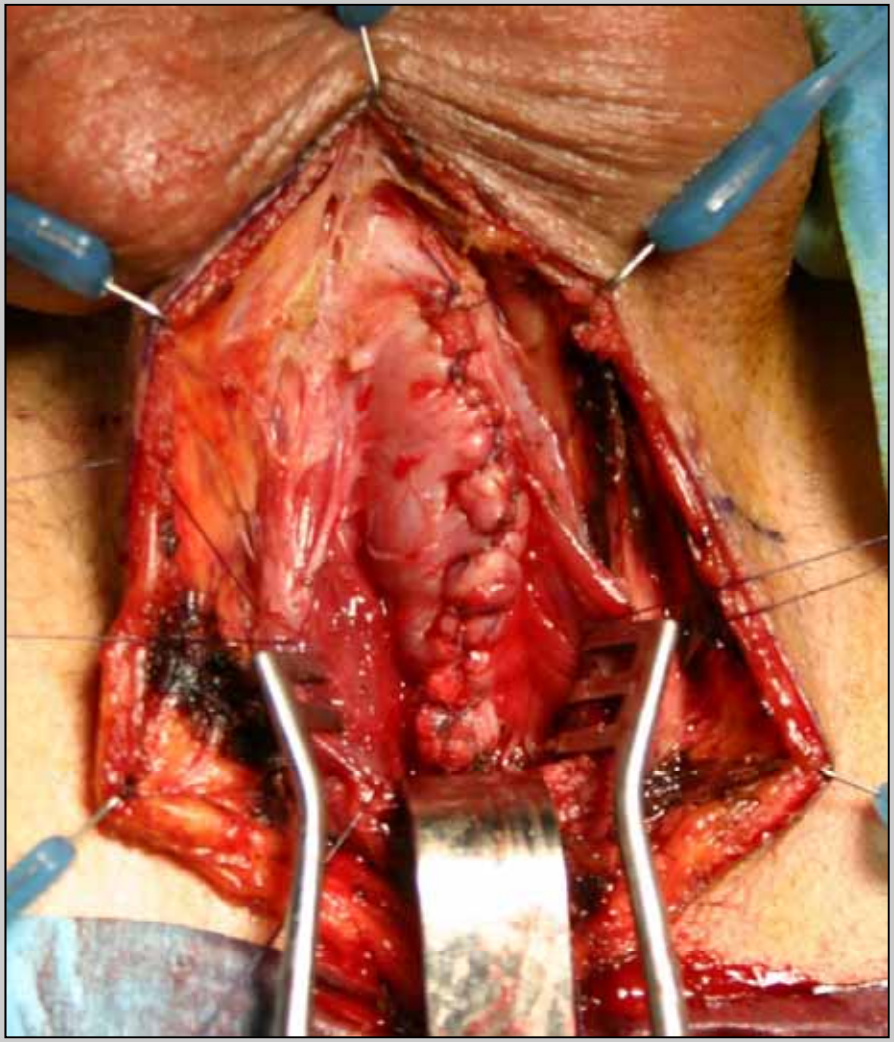

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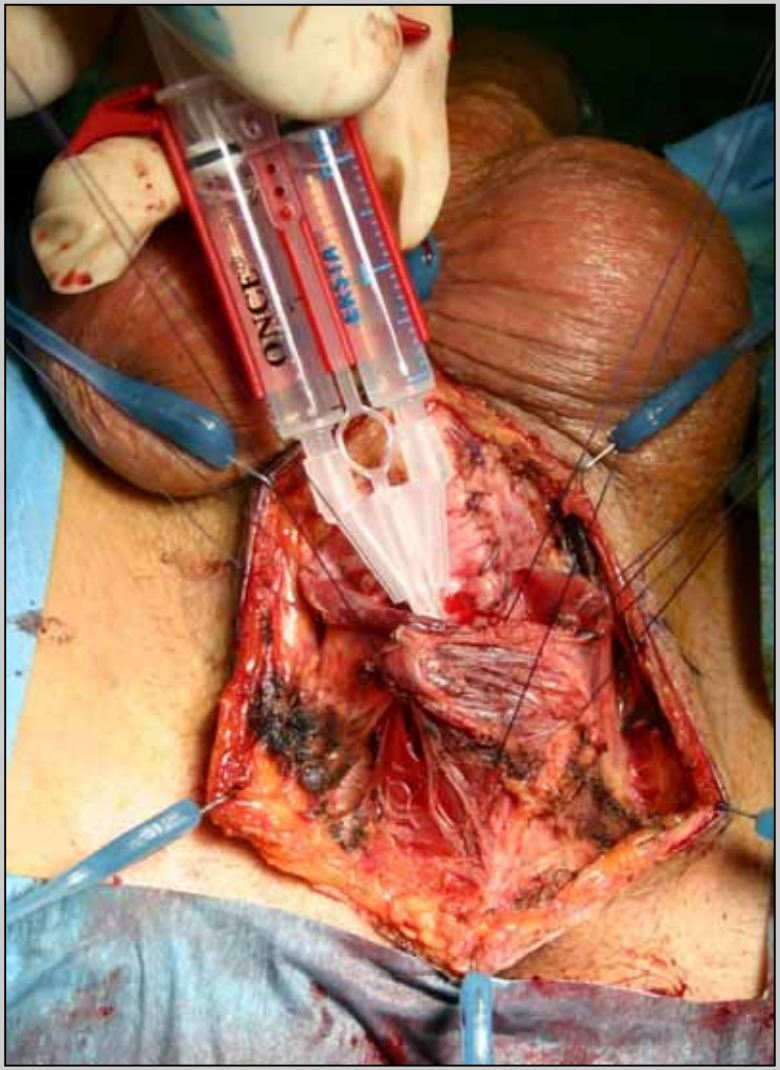
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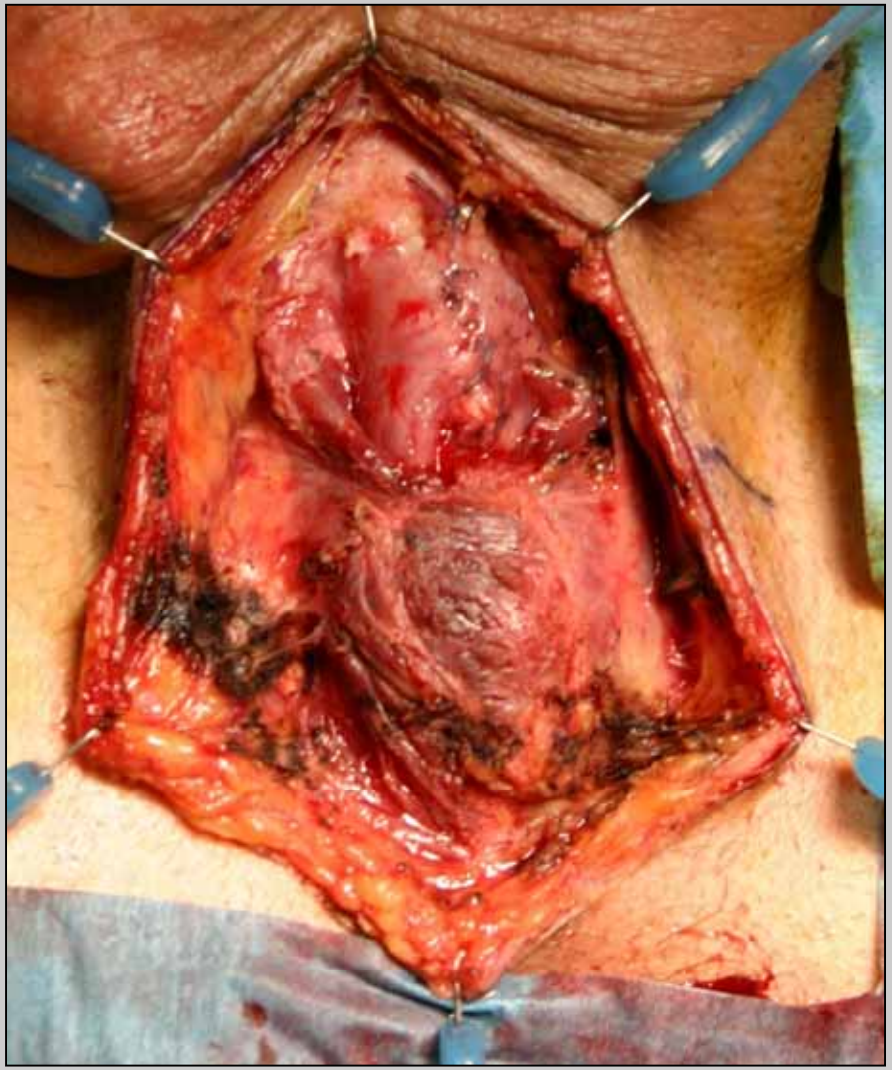
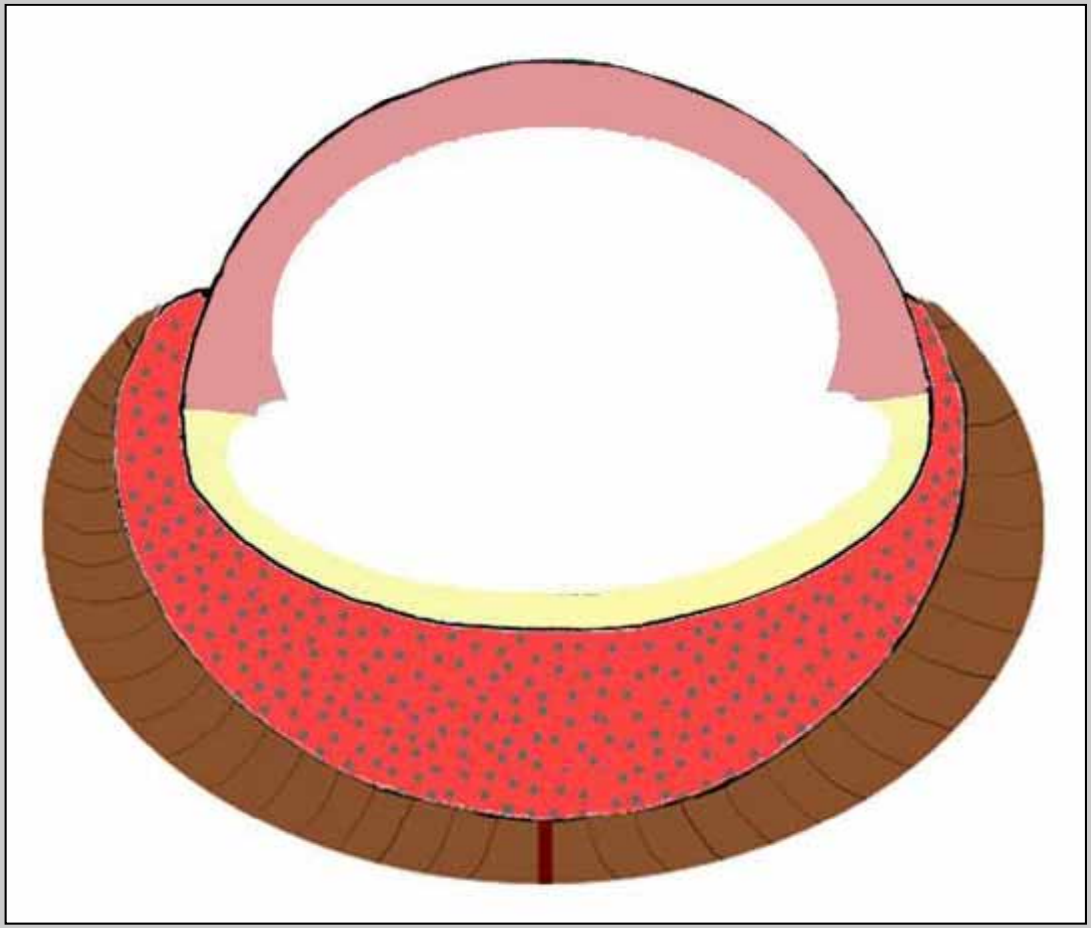


New dorsal onlay graft bulbar urethroplasty



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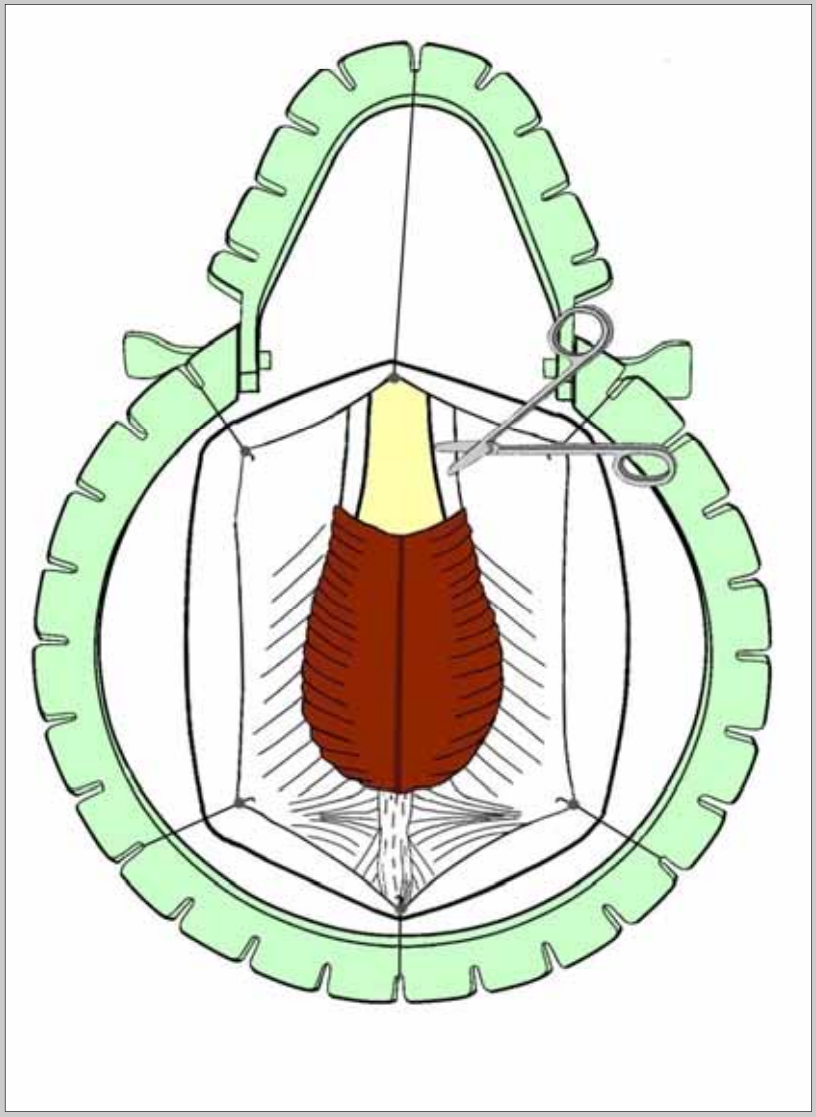

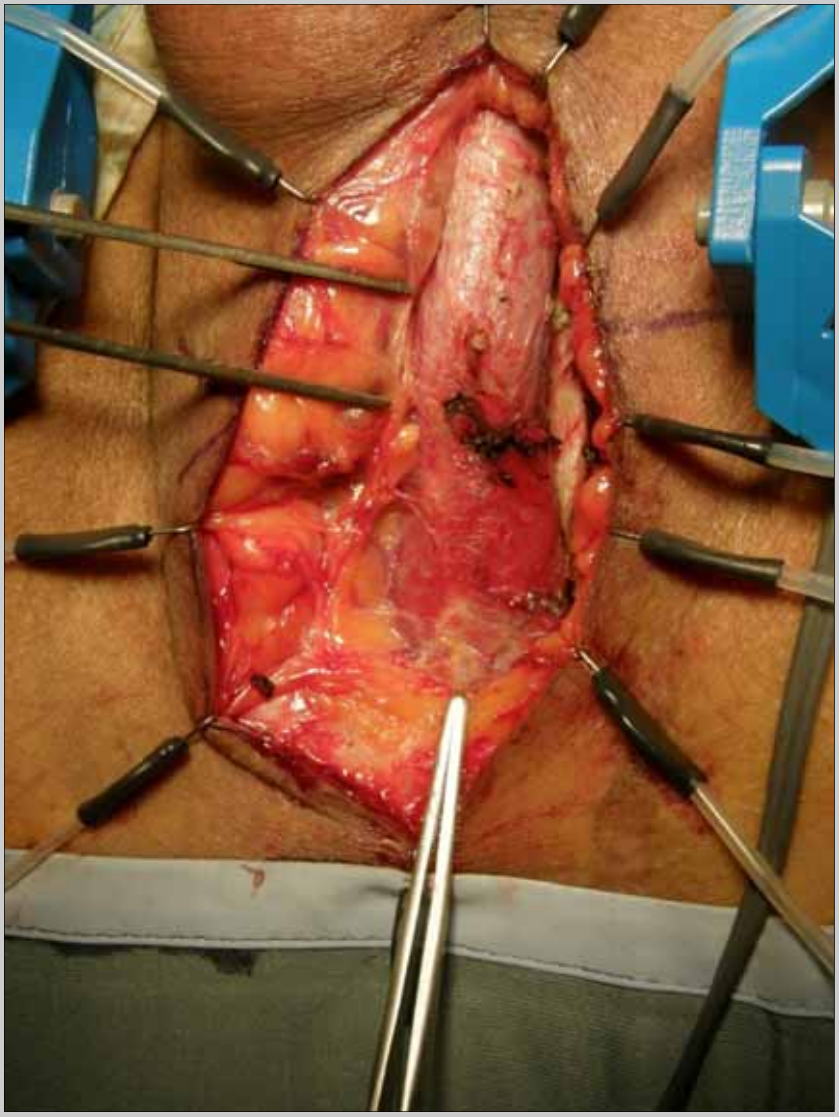

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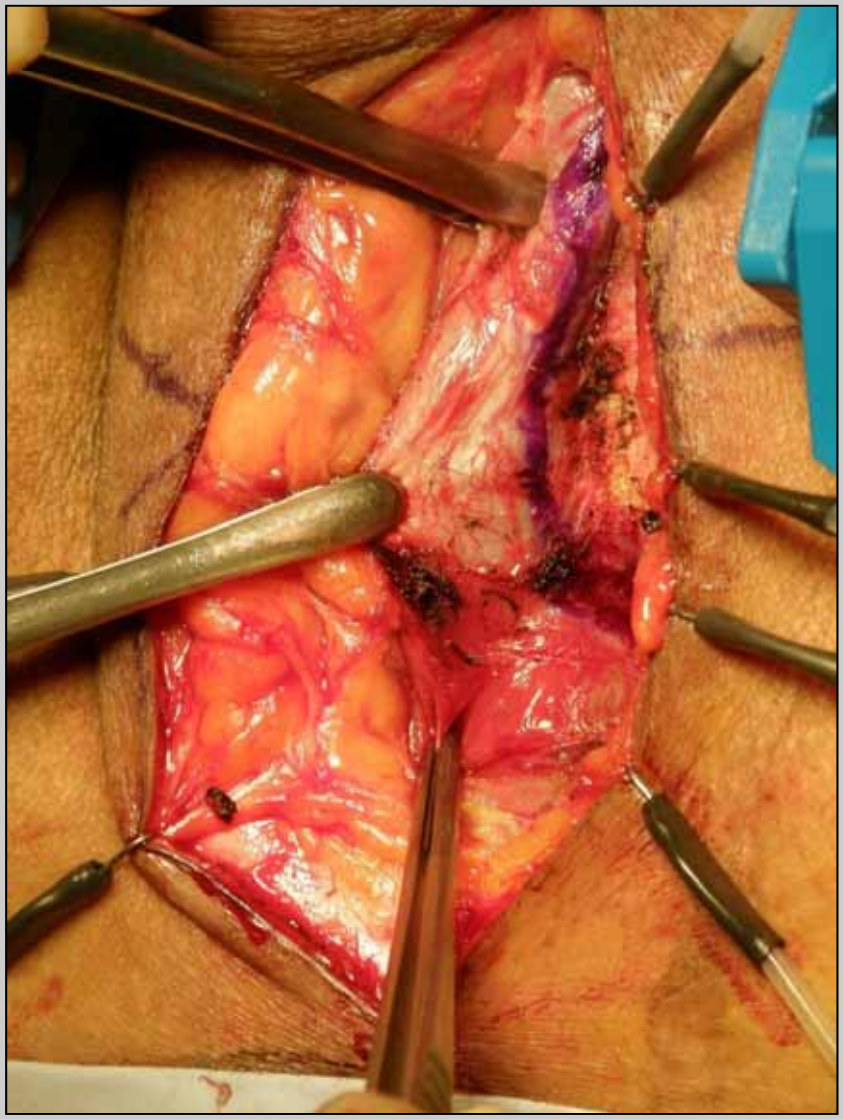

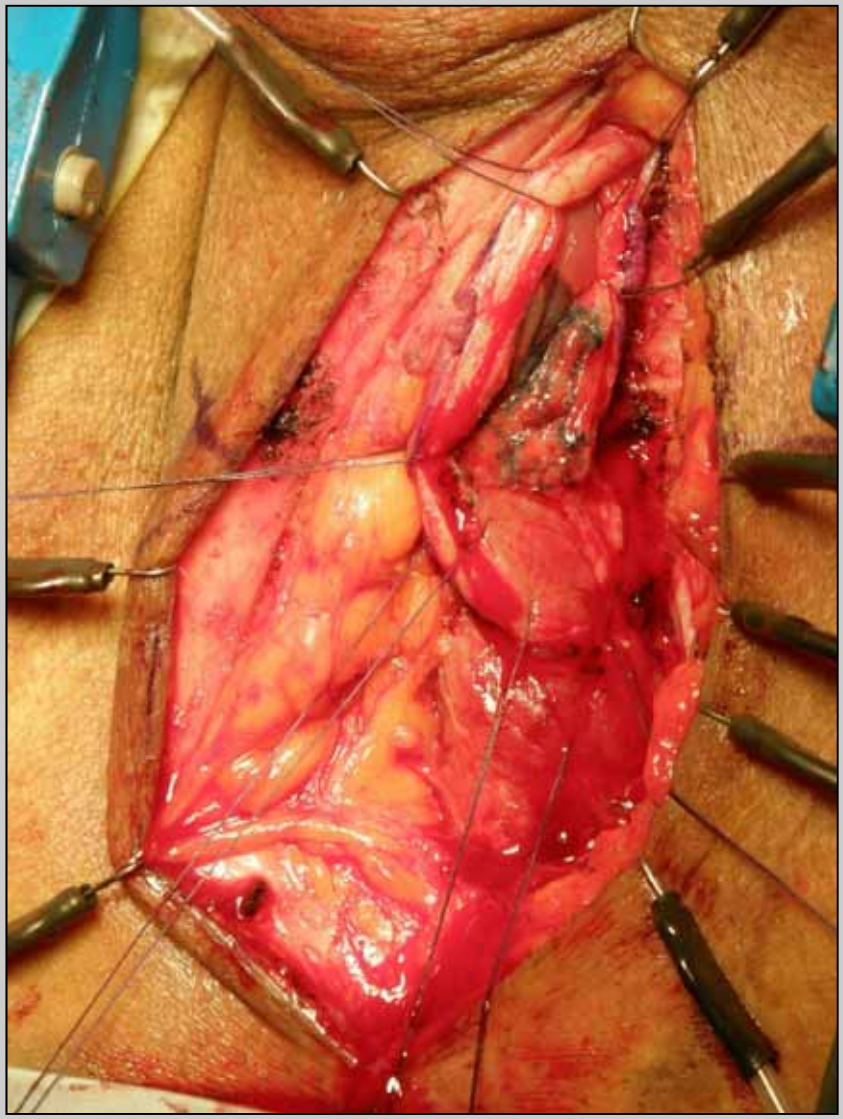

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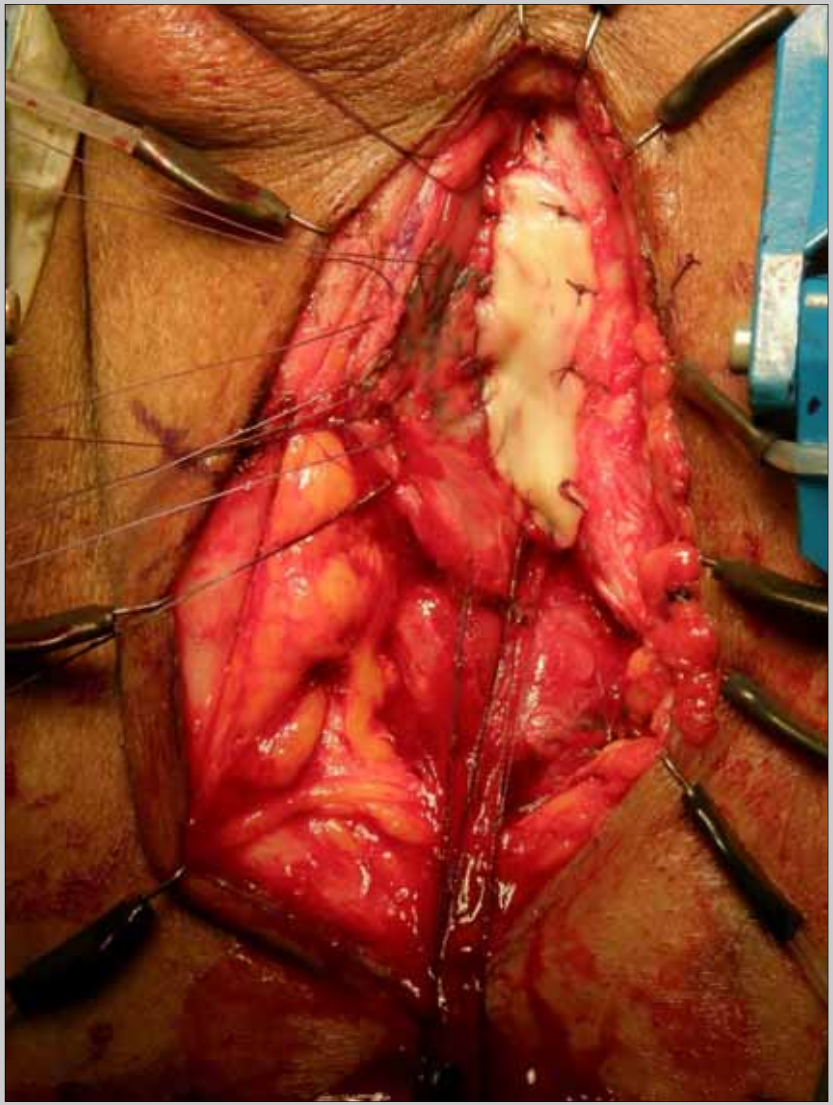

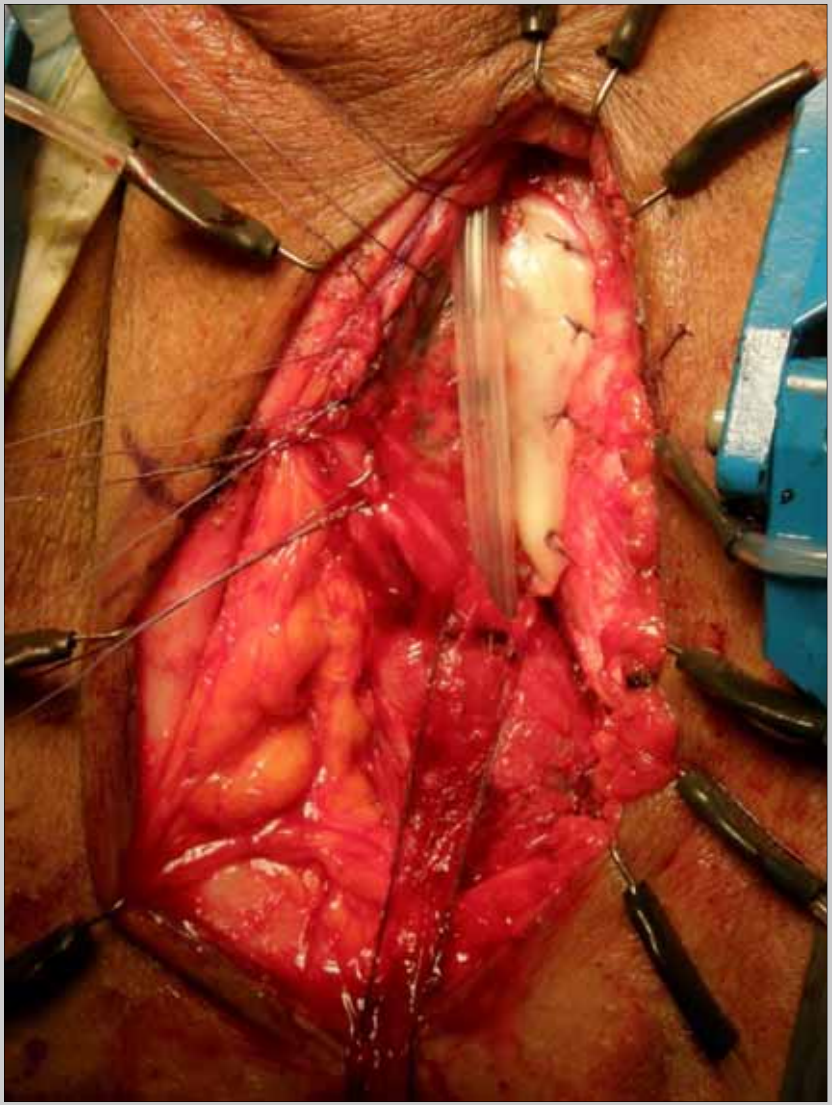

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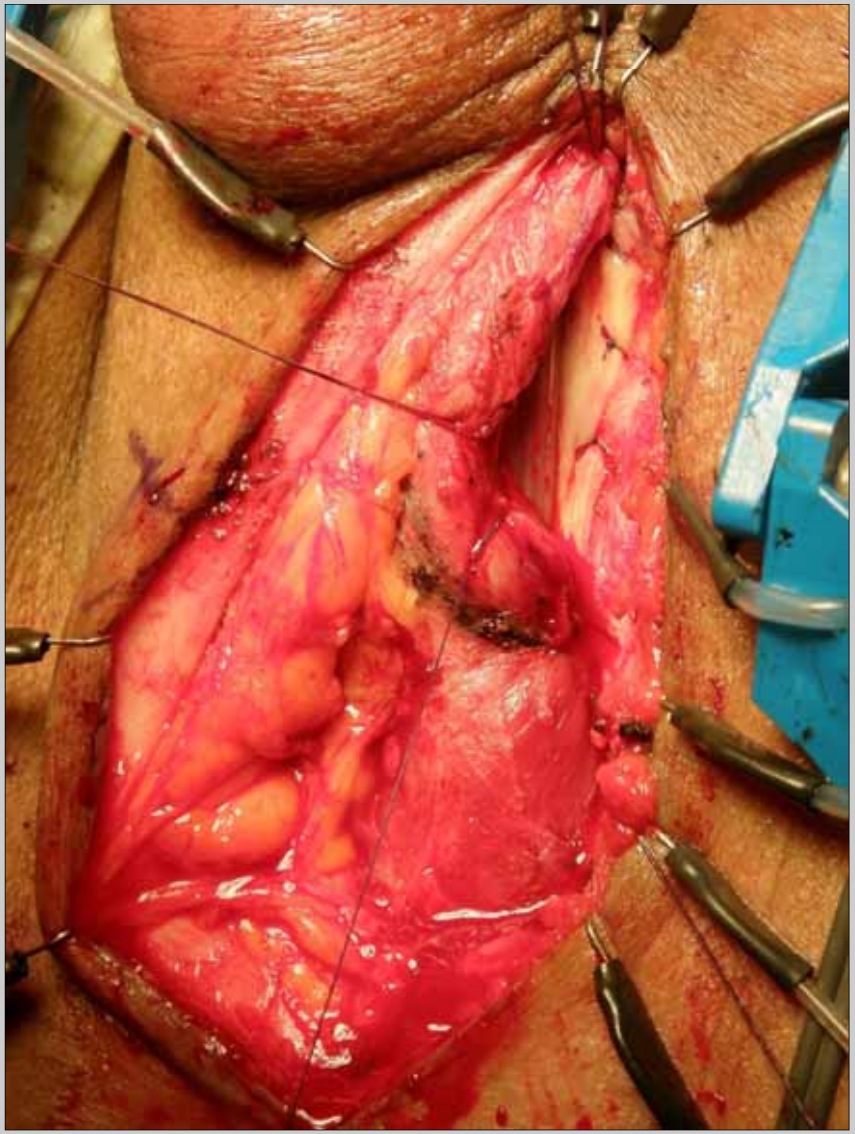

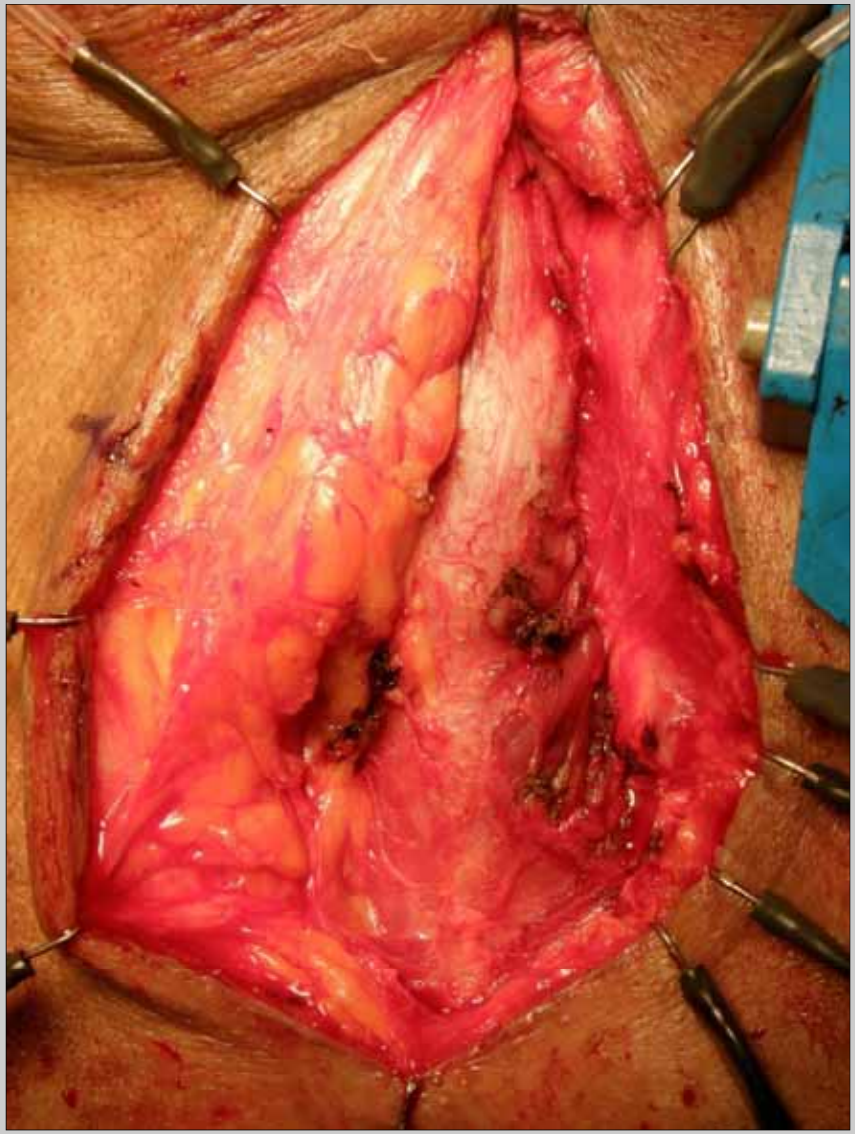

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New developments in urethral stricture disease:

Evaluation of the results

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Evaluation of the results

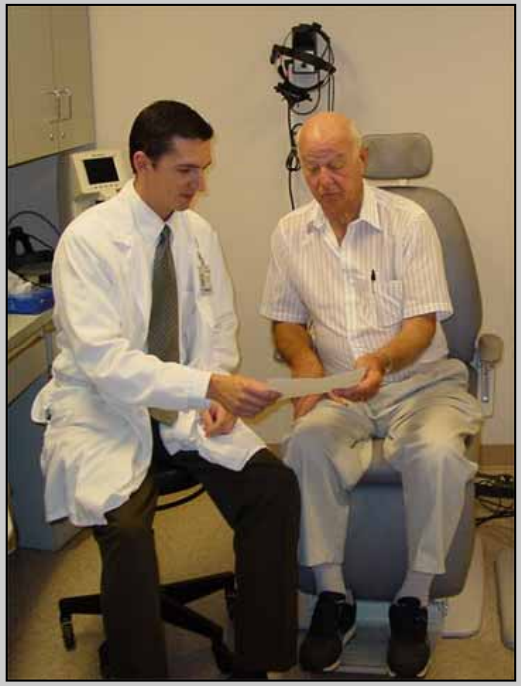
objective

subjective

Clinical assessment
Uroflowmetry
Urethrography
Urethral sonography
Urethroscopy

Questionnaire

The use of questionnaire to investigate the results of urethral surgery



Our preliminary experience

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Long-Term Followup of Bulbar End-to-End Anastomosis: A Retrospective Analysis of 153 Patients in a Single Center Experience

Guido Barbagli, Michele De Angelis, Giuseppe Romano and Massimo Lazzeri*

From the Center for Urethral Reconstructive Surgery (GB), Unità Operativa Urologia, Ospedale San Donato (MDA, GR), Arezzo, and Department of Urology, Santa Chiara-Firenze, Florence (ML), Italy

Purpose: We performed a retrospective evaluation and statistical analysis of outcome in patients who underwent bulbar end-to-end anastomosis.

Materials and Methods: We reviewed 153 patients with an average age of 39 years who underwent bulbar end-to-end anastomosis between 1988 and 2006. Mean followup was 68 months. Stricture etiology was unknown (62.7%), catheter (14.4%), blunt perineal trauma (11.7%), instrumentation (9.8%), radiotherapy (0.7%) and infection (0.7%). Stricture length was 1 to 2 cm (in 59.5%), 2 to 3 cm (37.9%), 3 to 4 cm (1.9%) or 4 to 5 cm (0.7%). A total of 90 patients (59%) underwent dilation, internal urethrotomy, urethroplasty or multiple procedures before being referred to our center. Clinical outcome was considered a treatment failure when any postoperative instrumentation was needed. The prevalence of postoperative sexual dysfunction was investigated using a nonvalidated questionnaire.

Results: Of 153 cases 139 (90.8%) were successful and 14 (9.2%) were treatment failures. Treatment failure was managed with urethrotomy in 9 cases, end-to-end anastomosis in 2, buccal mucosal graft urethroplasty in 1 and 2-stage repair in 2. Of 14 cases of failure 12 had a satisfactory final outcome, 1 is still waiting for the second stage of urethroplasty and 1 underwent definitive perineostomy. There were 14 patients (23.3%) who experienced ejaculatory dysfunction, 1 (1.6%) a cold glans during erection, 7 (11.6%) a glans that was neither full nor swollen during erection and 11 (18.3%) had decreased glans sensitivity. No patients complained of penile chordee or impotence.

Conclusions: Bulbar end-to-end anastomosis has a success rate of 90.8%. Most patients were satisfied with the surgical outcome despite postoperative complications such as ejaculatory dysfunction, a glans that was neither full nor swollen during erection, or decreased penile sensitivity.

Key Words: urethra; urethral stricture; anastomosis, surgical; treatment outcome;

J Urol 2007; 178:2470-2473

Questionnaire to investigate sexual dysfunction after bulbar end-to-end anastomosis

Changes in Ejaculation

Did you complain of ejaculation disorders after the surgery?

Yes
No

Did you recognize changes in ejaculation after the surgery comparing it with your previous status?

Yes
No

Does ejaculation occur with difficult stream?

Yes
No

If Yes, what is the stream like?

No stream
Very poor spontaneous stream
The stream occurs only by manually compressing the perineum

Is the ejaculation difficulty present:

Always
Sometimes
Seldom

Did you have negative changes in the relationship with your partner due to difficult ejaculation?

Yes
No

Did you have children after the surgery?

Yes
No

six questions to investigate ejaculatory disorders

J Urol 2007; 178:2470-2473

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Neurovascular Penile Disorders

Did you complain of penile erection disorders after the surgery?

Yes
No

Does your glans fully swell during erection?

Yes
No

If No:

Glans is not swollen
Glans is partially swollen
Glans is fully swollen at the beginning of erection, but it was not maintained ully swollen throughout the sexual activity

Did you have negative changes in your sexual activity due to this problem?

Yes
No

If Yes, what kind of problems did you recognize?

Psychological problems
Problems during vaginal intercourse
Other minor problems

Did you recognize a change in penile sensitivity after surgery?

Yes
No

If Yes, where did you localize sensitivity changes?

In the glans
In penile skin
In distal penile shaft
Including all penile shaft

What was the penile sensitivity like after surgery?

Decreased
Increased
Not specifically altered

Was the penile sensitivity changed in relation to:

Touch
Cold/hot
All stimulus

During the erection do you complain of cold glans?

Yes
No

Did you have negative changes in your sexual activity due to this problems?

Yes
No

seven questions to investigate neurovascular penile disorders

J Urol 2007; 178:2470-2473

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Final assessment of surgery

Are you satisfied of surgical outcome and what is your judgment of final results?

1. Not satisfied
2. Poor satisfied
3. Satisfied
4. Very satisfied

1. Negative
2. Poor
3. Good
4. Excellent

If your answer was 1 or 2

Is it because you did not improve urinary function?
Is it because your sexual activity was worsened?

Would you repeat the surgery?

Yes
No

If No, why?

Due to postoperative pain
Due to psychological problems
Because the outcome was different from what I foresaw

Two questions to investigate final patient satisfaction

J Urol 2007; 178:2470-2473

This non-validated questionnaire was administered to 60 out of 153 patients who underewent bulbar end-to-end anastomosis, according to the following inclusion criteria:

- ❖ **Age 20 to 50 years old**
- ❖ **No diabetes or vascular diseases**
- ❖ **No previous failed open urethroplasty**
- ❖ **No further surgery required after the anastomosis**

J Urol 2007; 178:2470-2473

Results

12 (20%) patients showed decreased ejaculation force.

11 (18.3%) patients complained of decreased sensitivity of the glans or distal penile shaft.

7 (11.6%) patients complained of a glans that was neither full nor swollen during erection.

2 (3.3%) patients showed ejaculation was possible only by manually compressing the perineum at the level of the urethral bulb.

1 (1.6%) patient had a cold glans during erection.

J Urol 2007; 178:2470-2473

Results

19/60 patients (31.6%) showed minor sexual dysfunctions

14/60 patients (23.3%) showed ejaculatory dysfunction

2/60 (3.3%) patients declared that they were dissatisfied with the outcome of surgery

J Urol 2007; 178:2470-2473

Evaluation of the result after bulbar end-to-end anastomosis

objective

subjective

Clinical assessment
Uroflowmetry
Urethrography
Urethral sonography
Urethroscopy

Questionnaire

90.8% success

31.6% sexual dysfunctions

23.3% ejaculatory dysfunction

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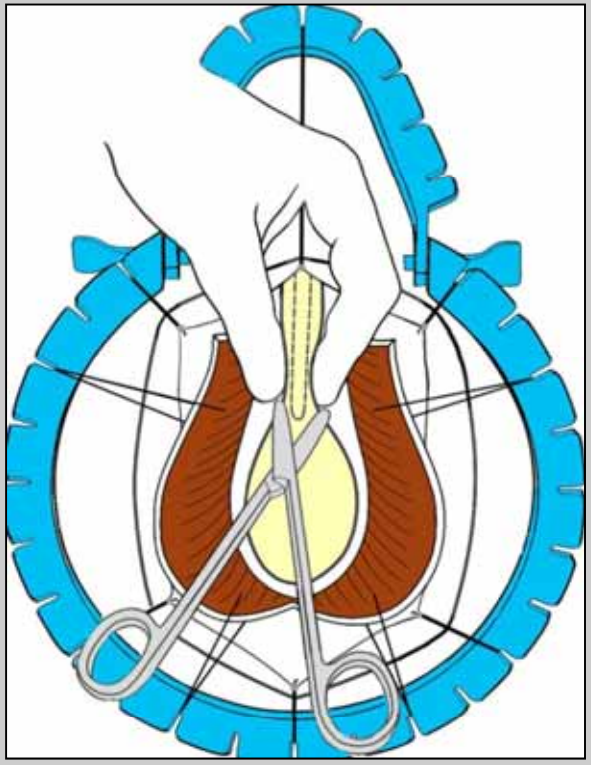
According to the result of this questionnaire we decide to change our clinical approach to bulbar urethral stricture:



We transect the urethra only in traumatic stricture

Clinical Outcome and Quality of Life Assessment in Patients Treated With Perineal Urethrostomy for Anterior Urethral Stricture Disease

Guido Barbagli, Michele De Angelis, Giuseppe Romano and Massimo Lazzeri*

From the Center for Reconstructive Urethral Surgery (GB) and Unità Operativa Urologia, Ospedale San Donato (MDA, GR), Arezzo, and Department of Urology, Santa Chiara-Firenze, Florence (ML), Italy

Submitted for publication December 4, 2008.
Nothing to disclose.
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Editor's Note: This article is the third of 5 published in this issue for which category 1 CME credits can be earned. Instructions for obtaining credits are given with the questions on pages 808 and 809.

Purpose: We performed a quality of life assessment for patients treated with perineal urethrostomy for anterior urethral stricture disease.
Materials and Methods: We retrospectively reviewed 173 patients (median age 55 years) who underwent perineal urethrostomy (from 1978 to 2007) as part of a plan for a staged urethroplasty repair for a complex anterior urethral stricture. The perineostomy was made using flap urethroplasty. The clinical outcome was considered a failure when postoperative instrumentation was needed. A questionnaire was used to evaluate patient quality of life and satisfaction.
Results: Stricture etiology was unknown in 50.3% of the cases, lichen sclerosus in 17.3%, catheter in 13.3%, instrumentation in 8.7%, failed hypospadias repair in 4.6%, trauma in 4.1% and infection in 1.7%. Stricture length was 1 to less than 2 cm in 1.2% of cases, 2 to less than 3 cm in 3.5%, 3 to less than 4 cm in 12.1%, 4 to less than 5 cm in 13.8%, 5 to less than 6 cm in 7.5%, greater than 6 cm in 4.1% and panurethral in 57.8%. Of 173 patients 91 (52.6%) underwent prior urethroplasty. Median followup length was 62 months (range 12 to 361). Of 173 cases 121 (70%) were successful and 52 (30%) were failures, requiring revision of the perineostomy. Of 173 patients 135 (78%) were satisfied with the results obtained with surgery, 33 (19.1%) were very satisfied, 127 (73.4%) with a median age of 57 years (range 23 to 85) refused to do the second stage of urethroplasty and 46 (26.6%) with a median age of 47.5 years (range 27 to 72) are currently on a waiting list for the second stage of urethroplasty.
Conclusions: Perineostomy is a necessary procedure for patients with complex urethral pathology and satisfaction rates are high.

J Urol 2009; 182:548-557

Questionnaire to investigate patient quality of life and satisfaction after perineal urethrostomy

	YES	NO
Has the perineal urethrostomy caused you any problems?	**28 (16%)**	**145 (84%)**
Psychological problems	**9 (32%)**	
Urination problems	**13 (46%)**	
Sexual activity problems	**6 (22%)**	
Have you had problems with your partner due to this operation?	**32 (18%)**	**141 (82%)**
Psychological problems	**11 (35%)**	
Penetration problems	**13 (40%)**	
Minor problems	**8 (25%)**	
Are you pleased with the results obtained with surgery?		
Dissatisfied	**2 (1.2%)**	
A little satisfied	**3 (1.7%)**	
Satisfied	**135 (78%)**	
Very satisfied	**33 (19.1%)**	
How would you evaluate these results?		
Negative	**3 (1.7%)**	
Fair/passable	**4 (2.3%)**	
Good	**121 (69.9%)**	
Excellent	**45 (26.1%)**	
Would you undergo this type of operation again?	**168 (97.1%)**	**5 (2.9%)**
Would you like to undergo second stage urethroplasty to restore normal urinary function?	**46 (26.6%)**	**127 (73.4%)**

six questions to investigate patient quality of life

J Urol 2009; 182:548-557

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Patient satisfaction according to age

		N° Pt Age (%)		
	N° Pts	23-49 years	50-69 years	Older than 70 years
Dissatisfied	2 (1.2%)		1 (50%)	1 (50%)
Little satisfied	3 (1.7%)	2 (66.7%)	1 (33.3%)	
Satisfied	135 (78%)	54 (40%)	65 (48.2%)	16 (11.8%)
Very satisfied	33 (19.1%)	11 (33.3%)	19 (57.6%)	3 (9.1%)
Totals	173 (100%)	67 (38.7%)	86 (49.7%)	20 (11.6%)

two questions to investigate patient satisfaction

J Urol 2009; 182:548-557

Results

135/173 patients (78%) were satisfied with the results obtained with surgery

33/173 patients (19.1%) were very satisfied with the results obtained with surgery

J Urol 2009; 182:548-557

Results

Would you undergo this type of operation again?

YES : 168/173 patients (97.1%)

NO: 5/173 patients (2.9%)

J Urol 2009; 182:548-557

Evaluation of the results after perineal urethrostomy

objective

subjective

Clinical assessment
Uroflowmetry
Urethrography
Urethroscopy

Questionnaire

70% success

78% satisfied

19.1% very satisfied

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CENTRO DI CHIRURGIA RICOSTRUTTIVA DELL'URETRA E DEI GENITALI MASCHILI

Prof. G.Barbagli

USL8 Azienda Unità Sanitaria Locale Arezzo

U.O. di Urologia
PO S.Donato AR

Primario
Dr M.de Angelis

DEFINITIVE PERINEAL URETHROSTOMY IN PATIENTS WITH FAILED HYPOSPADIAS REPAIR

Dr Giuseppe Romano

Center for Reconstructive Urethral Surgery - U.O. di Urologia Ospedale S.Donato USL8 - Arezzo

Italy

Retrospective Descriptive Analysis of 1,176 Patients With Failed Hypospadias Repair

Guido Barbagli, Sava Perovic, Rados Djinovic, Salvatore Sansalone and Massimo Lazzeri*

From the Center for Reconstructive Urethral Surgery (GB), Arezzo and Departments of Urology, University "Tor Vergata" (SS), Rome and Santa Chiara-Firenze (ML), Florence, Italy, and Clinical Centre "Zvezdara," University of Belgrade (SP, RD), Belgrade, Serbia

Purpose: To our knowledge epidemiological data on the incidence of failed hypospadias repair and the number of patients seeking further surgical treatment remain unknown. We report an observational, descriptive survey of patients who were evaluated and treated for urethral stricture disease and/or penile defects after primary hypospadias repair.

Materials and Methods: We performed a retrospective observational chart analysis of patients evaluated and treated for urethral stricture disease and/or penile defects at 2 tertiary European centers from January 1998 to December 2007. In each case we investigated the primary abnormal meatal site, the number of operations needed to repair primary hypospadias and complications of this primary repair. Patients were offered surgical repair for previous failed hypospadias treatment. After surgery evaluation was scheduled at 3, 6 and 9 months. Success was defined as a functional urethra without fistula, stricture or residual chordee and a cosmetically acceptable glanular meatus after the completion of all secondary procedures.

Results: A total of 1,176 patients with a mean age of 31 years were evaluated and treated. To treat failed hypospadias repair 760 (64.6%) and 416 patients (35.4%) underwent 1-stage and staged repair, respectively. Mean followup was 60.4 months. Of 1,176 cases 1,036 (88.1%) were classified as successful and 140 (11.9%) were considered failures.

Conclusions: Failed hypospadias repair may be corrected by multiple and complex surgeries. Its effects are experienced during the lifetime of the patient and parents.

Submitted for publication May 19, 2009.

Study received local Italian and Serbian institutional review board approval.

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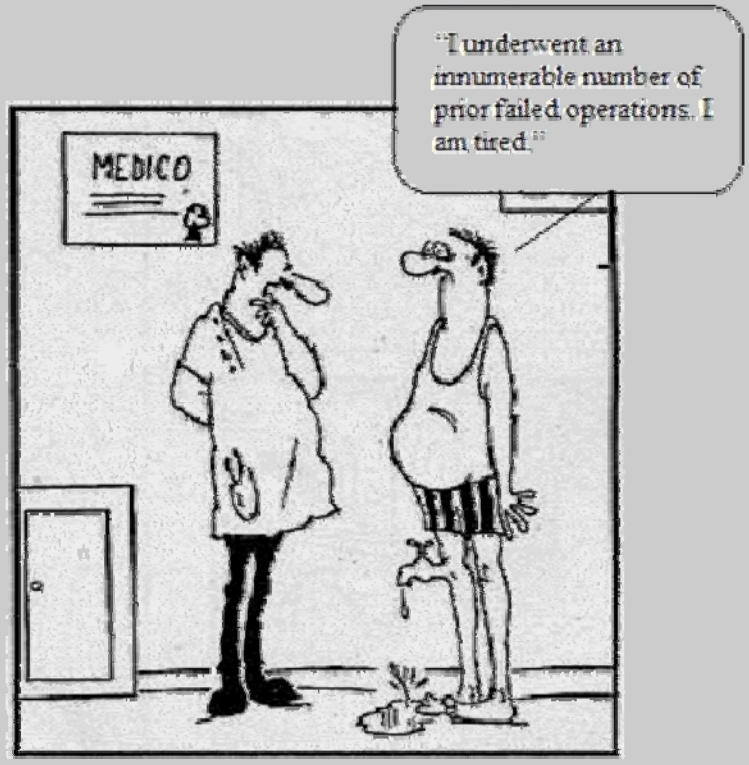
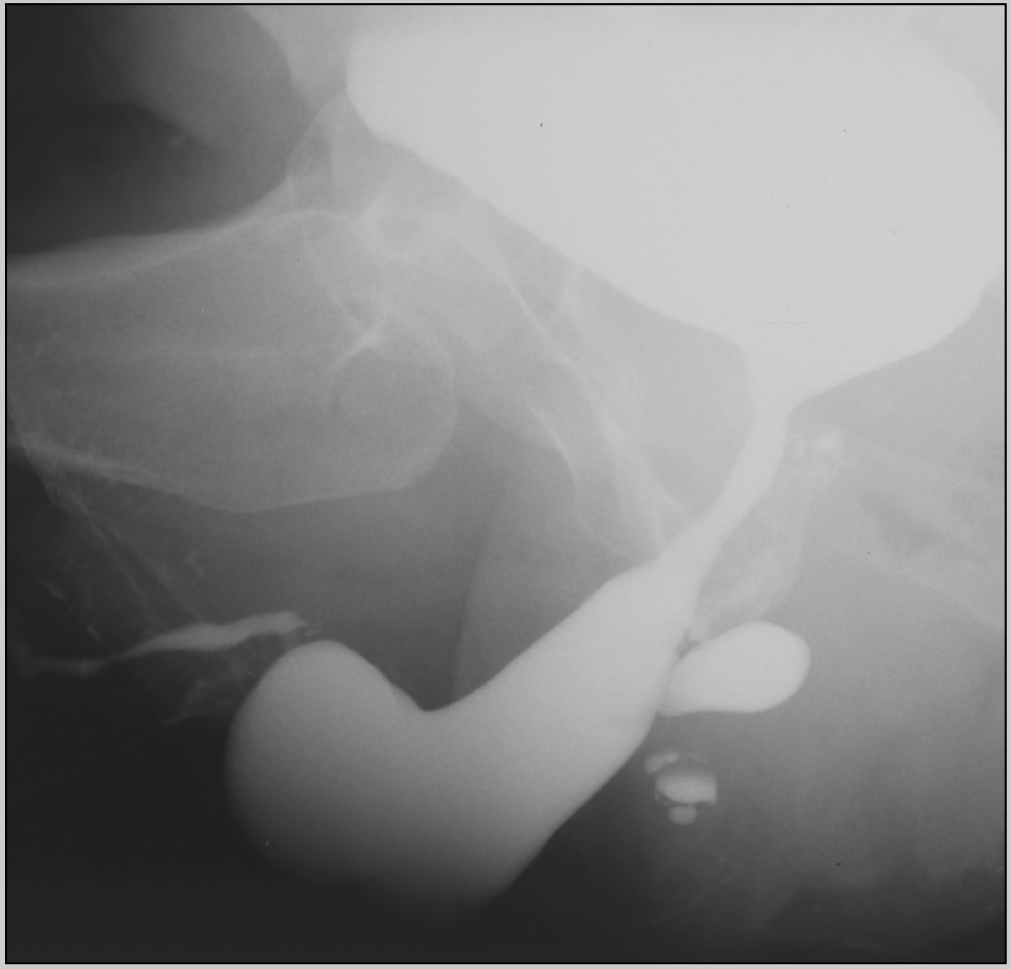
J Urol 2010; 183:207-211

The population of patients included those who informed us, "I underwent an innumerable number of prior failed operations. I am tired." These words were usually from patients (mean age 53 years) who had undergone failed hypospadias repair (mean previous operations 4.5). These patients were unable to accept the possibility of another complete urethroplasty failure.





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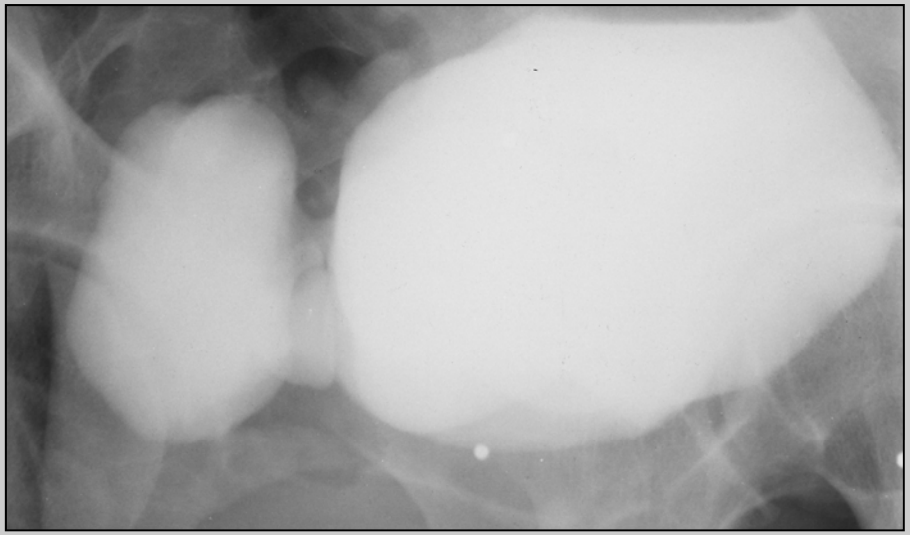

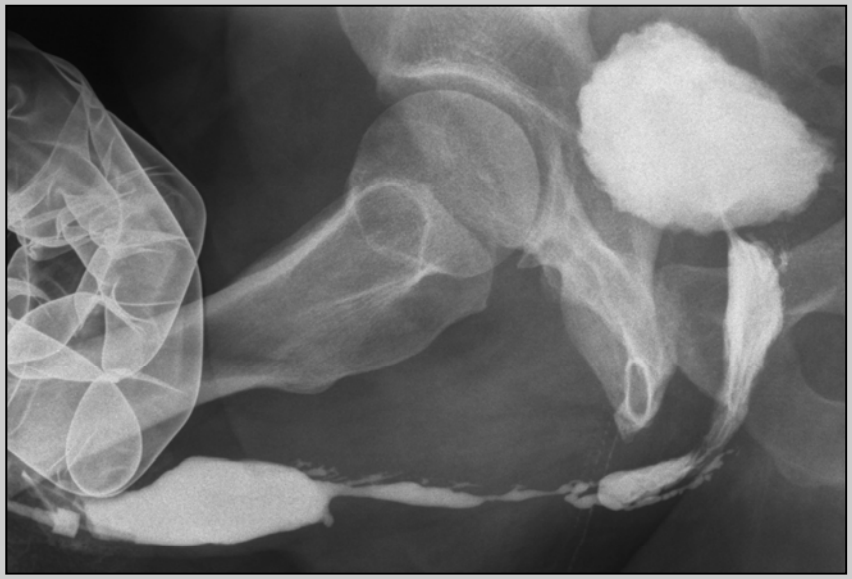

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patient	age	married	sons	n° operations	hypospadias	Concomitant pathology
CF	49	No	No	10	Scrotal	Diabetes - Down
CB	65	Si	No	5	Balanic	BPI
DCG	33	No	No	3	Scrotal	CRF - Dialysis
FG	67	Si	No	6	Scrotal	
FM	64	Si	Si	3	Scrotal	
GS	41	Si	Si	7	Scrotal	
GP	58	Si	Si	3	Scrotal	
LBS	35	No	No	2	Scrotal	
MG	64	Si	No	3	Scrotal	
PG	58	Si	Si	5	Scrotal	Squamous CA
PG	70	Si	Si	13	Penile	Diabetes
PM	47	Si	No	10	Scrotal	
PP	64	Si	No	12	Scrotal	
SF	20	No	No	2	Scrotal	Heavy psychomotor delay
SL	31	Si	No	8	Scrotal	
CS	53	Si	No	13	Scrotal	Anus – scrotal malformation

Questionnaire

1. Has the perineal urethrostomy caused you any problems?

Psychological problems
Urination Problems
Sexual activity problems

2. Have you had problems with your partner due to this operation?

Psychological problems
Penetration problems
Minor problems

3. Are you pleased with the result obtained with surgery?

Dissatisfied
A little satisfied
Satisfied
Very satisfied

4. How would you evaluate these results?

Negative
Fair/passable
Good
Excellent

5. Would you undergo this type of operation again?

Yes
No

6. Would you like to undergo second stage urethroplasty to restore normal urinary function?

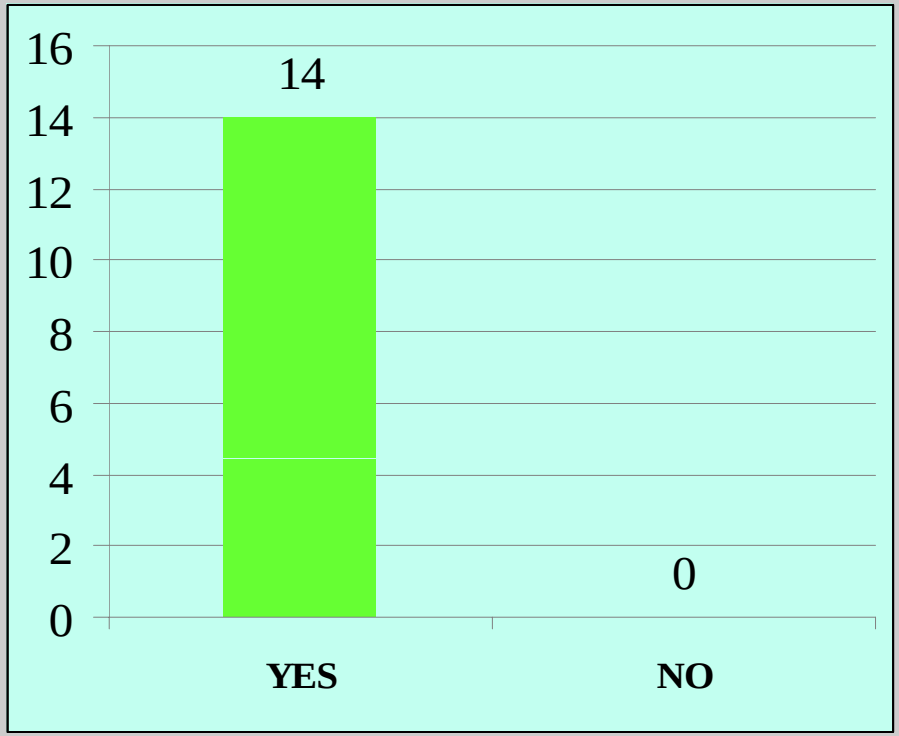
Yes
No

14/16 patients

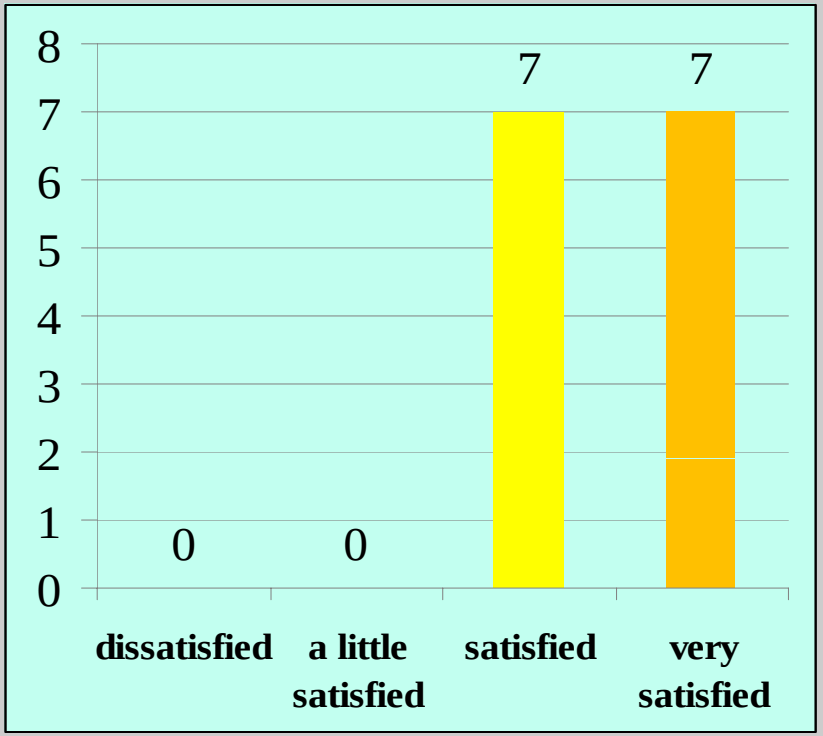
	YES	NO
Has the perineal urethrostomy caused you any problems?	**3 (21%)**	**11 (79%)**
Psychological problems	**2 (66.7%)**	
Urination problems		
Sexual activity problems	**1 (33.3%)**	
Have you had problems with your partner due to this operation?	**0**	**14 (100%)**
Psychological problems		
Penetration problems		
Minor problems		
Are you pleased with the results obtained with surgery?		
Dissatisfied		
A little satisfied		
Satisfied	**6 (42.8%)**	
Very satisfied	**8 (57.2%)**	
How would you evaluate these results?		
Negative		
Fair/passable		
Good	**7 (50%)**	
Excellent	**7 (50%)**	
Would you undergo this type of operation again?	**14 (100%)**	
Would you like to undergo second stage urethroplasty to restore normal urinary function?	**1 (7%)**	**13 (93%)**

Results

Would you do this type operation again?



Patient satisfaction



Definitive perineal urethrostomy is often a necessary procedure when dealing with complex urethral pathology.

Patient satisfaction following this surgical procedure is high and quality of life is not negatively influenced.

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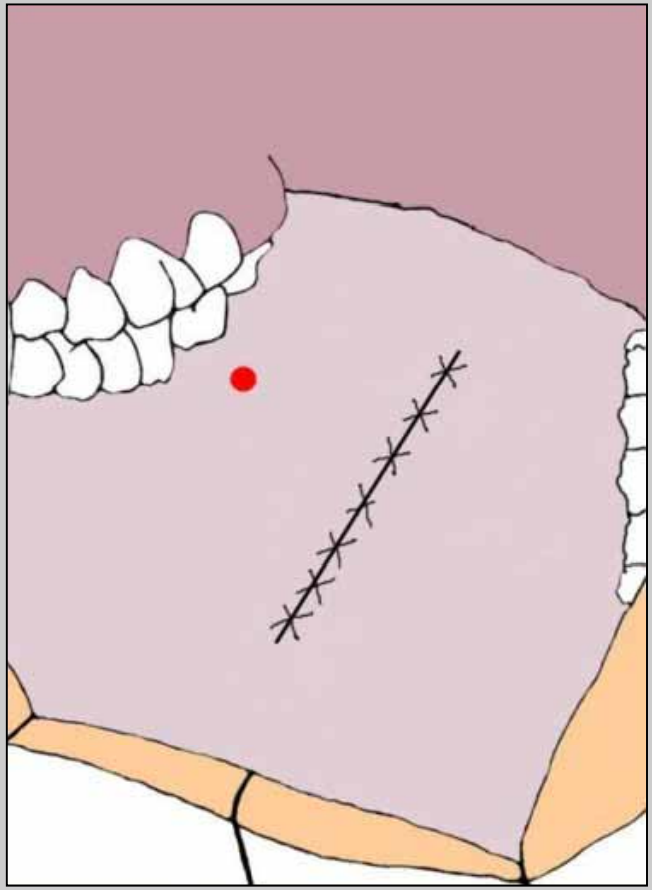
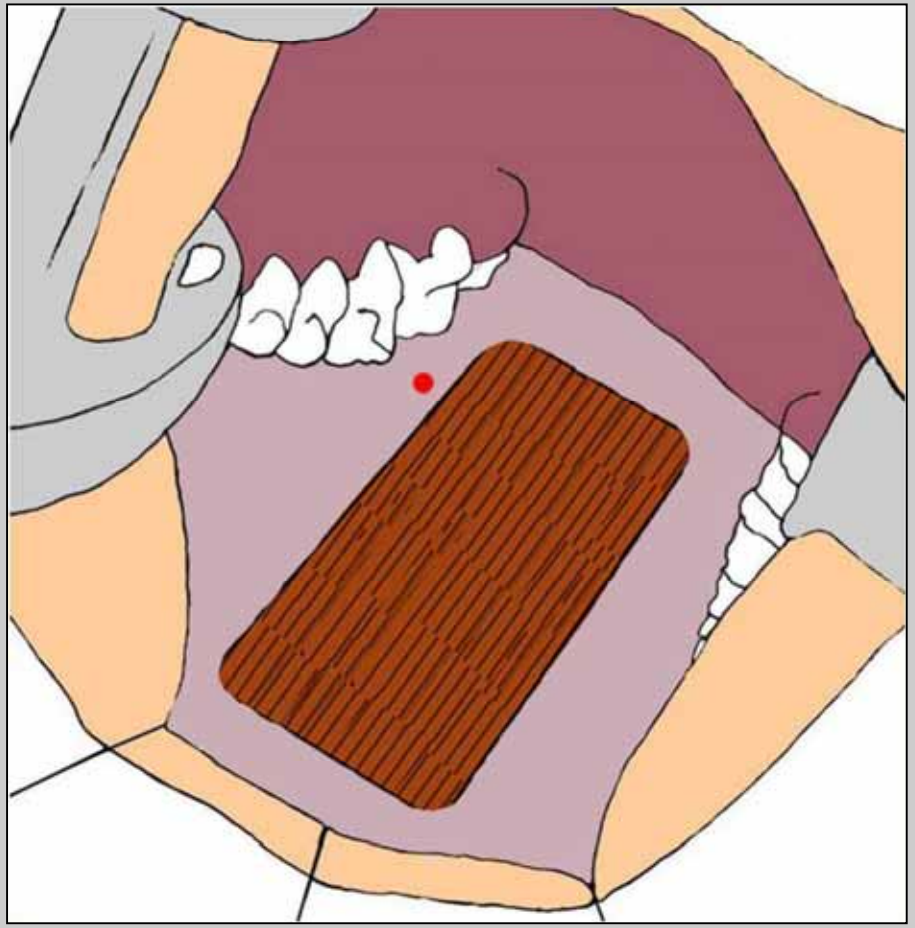
Substitute material for urethroplasty

1. Genital or extragenital skin
2. Bladder mucosa
3. Oral mucosa
4. Colonic mucosa
5. Other material
6. Tissue engineered material





Closure ? **Nonclosure**

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Morbidity of Oral Mucosa Graft Harvesting from a Single Cheek

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Article info

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Keywords:
Oral mucosa
Urethroplasty
Urethral stricture
Cheek
Postoperative complications
Quality of life

Abstract

Background: The oral mucosa (OM) is a popular substitute for urethroplasty.
Objective: The aim of this study was to investigate oral morbidity and patient satisfaction in a homogeneous group of patients who underwent OM harvesting.
Design, setting, and participants: This study is a prospective analysis of 350 patients who underwent OM harvesting from a single cheek.
Intervention: The graft was harvested in an ovoid shape with closure of the wound. Standard graft size was 4 cm in length and 2.5 cm in width.
Measurements: Self-administered, nonvalidated semiquantitative (0, absence of complications or symptoms; 3, the worst complication or symptom) questionnaire consisting of six questions was used to investigate early complications, with 13 questions designed to investigate late complications and patient satisfaction.
Results and limitations: Early complications included bleeding, which occurred in 15 patients (4.3%); two patients required immediate surgical revision of the harvesting site. The majority of patients (85.2%) showed no pain, and only 3.7% of patients required use of anti-inflammatory drugs. The majority of patients (65.8%) showed slight or moderate swelling. With respect to late complications, most of the patients (73.4%) reported oral numbness for 1 wk, 22.9% for 1 mo, and 3.77% for 3 mo. Numbness resulting from scarring was absent or slight in most of patients. Changes in oral sensitivity occurred in 2.3% of patients. No difficulties opening the mouth or smiling was found in 98.3% and 99.7% of patients, respectively. Slight or moderate dry mouth was found in 97.1% of patients. In response to the question, "Would you undergo oral mucosa graft harvesting using this technique again," 343 patients (98%) replied "yes," and 7 patients (2%) replied "no."
Conclusions: The harvesting of an OM ovoid graft from a cheek with closure of the wound is a safe procedure with a high patient satisfaction rate.

Eur Urol 2010; 58:33-41

Questionnaire to investigate early, late complications and patient satisfaction after oral mucosa graft harvesting (350 patients)

1) Did you suffer from bothersome bleeding during the three days following oral mucosa harvesting?

Yes
No

2) How would you score the oral pain during the three days following oral mucosa harvesting?

No pain
Light
Moderate
Severe

3) How would you score the oral swelling during the three following oral mucosa harvesting?

No swelling
Light
Moderate
Severe

4) Following surgery, when did you resume a normal diet?

After 3 days
After 6 days
After 10 days

5) What you bothered you most during the early post-operative period?

The oral wound
The perineal wound

6) Did you take pain killers during the three days following oral mucosa harvesting?

Yes
No

Six questions to investigate early complications

Eur Uro 2010; 58:33-41

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Questionnaire to investigate early, late complications and patient satisfaction after oral mucosa graft harvesting

1) How many days did oral numbness last after the surgery?

1 week
1 month
3 months

2) How would you rate the numbness experienced due to the oral stitches?

No numbness
Light
Moderate
Severe

3) Following surgery, how many months did the oral numbness last due to the stitches?

1 month
2 months
3 months

4) How would you score the numbness experienced due to the oral scar?

No numbness
Light
Moderate
Severe

5) Did you suffer from oral infection following the surgery?

Yes
No

6) After some months following the surgery, do you have:

Changes in oral sensitivity/sensibility/sensory perception
Oral numbness
Mouth pain
No problems

7) After some months following the surgery, do you have difficulties opening your mouth?

No
Light
Moderate
Severe

8) After some months following the surgery, do you have problems smiling?

No
Light
Moderate
Severe

9) After some months following the surgery, do you have dry mouth?

No
Light
Moderate
Severe

10) After some months following the surgery, do you have oral swelling after eating?

No
Light
Moderate
Severe

11) Did you resume eating normally following the surgery?

Yes
No

12) How much time passed before resuming a normal diet?

1 month
2 months
3 months

twelve questions to investigate late complications

Eur Uro 2010; 58:33-41

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Questionnaire to investigate early, late complications and patient satisfaction after oral mucosa graft harvesting

13) Would you undergo oral mucosa graft harvesting using this technique again?

Yes
No

One question to investigate patient satisfaction

Eur Uro 2010; 58:33-41

Results : early complications

How would you score the oral pain during 3 days following oral mucosa harvesting?

No pain 49.2%

slight 36%

moderate 13.7%

severe 1.1%

Eur Urol 2010; 58:33-41

Results : late complications

After surgery, do you have difficulties opening your mouth?

No 98%

slight 1.4%

moderate 0.3%

After surgery, do you have difficulties problems smiling?

No 99.7%

slight 0.3%

Eur Urol 2010; 58:33-41

Results : patient satisfaction

Would you undergo oral mucosa graft harvesting using this technique again?

Yes 98%

No 2%

Eur Urol 2010; 58:33-41

Defining a Patient-Reported Outcome Measure for Urethral Stricture Surgery

MJ Jackson, J Sciberras, A Mangera, A Brett, N Watkin, J N'Dow, C Chapple; D Andrich; R Pickard, AR Mundy

Eur Urol, 2011; in press

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Validazione della versione italiana del questionario inglese PROM-USS-Q in pazienti sottoposti ad uretroplastica anteriore

G Barbagli, G Romano, S Sansalone, M Lazzeri

Urologia, 2011; in press

Daily clinical surgical practice

Based-evidence medicine

Objective evaluation of the results

Subjective evaluation of the results

In the era of robotic surgery, it is also time to change urethral surgery!

- **Increase the use of minimally invasive techniques in urethroplasty, reducing the incidence of complications and improving patient quality of life.**

- **Increase the use of appropriate questionnaires to better evaluate the outcome of urethroplasty.**

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Evaluation of the results

objective

subjective

If you don’t look for complications following surgery,

you won’t find complications !

New developments in urethral stricture disease:

Tissue engineering

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Tissue-engineered buccal mucosa for substitution urethroplasty

S. BHARGAVA*†, C.R. CHAPPLE*, A.J. BULLOCK†, C. LAYTON† and S. MACNEIL†

Royal Hallamshire Hospital, Department of Urology, Section of Reconstruction, Urodynamics and Female Urology, and †University of Sheffield, Division of Clinical Sciences (North), Sheffield, South Yorkshire, UK

Accepted for publication 2 November 2003

OBJECTIVE

To develop tissue-engineered buccal mucosa (TEBM) for use in substitution urethroplasty, as urethral reconstruction is limited by the amount and type of tissue that is available for grafting, and BM has become the favoured tissue for use as a urethral substitute in the last decade.

MATERIALS AND METHODS

After enzymatic treatment of a small (0.5 cm) BM biopsy the epidermis and dermis were mechanically separated. Oral keratinocytes were isolated from the epidermis and oral fibroblasts from the dermis. These cells were expanded and applied to sterilized de-epidermized dermis (DED) to obtain a full-thickness TE oral mucosa. Horizontal migration of keratinocytes on the DED was assessed using a tetrazolium-blue (MTT) assay. The TEBM was assessed histologically after mechanical stressing *in vitro* using catheterization and meshing.

RESULTS

Histologically the TEBM closely resembled the native oral mucosa after culturing at an air–liquid interface for 2 weeks. The MTT assay showed good horizontal migration of keratinocytes on the DED. Serial histology revealed a gradually increasing thickness of the epidermis and remodelling of the dermis by the fibroblasts from day 1 to day 14. Despite subjecting the TEBM to mechanical stress the integrity of the epidermal-dermal junction was maintained.

CONCLUSIONS

We report the successful culture of full-thickness TEBM for substitution urethroplasty, which is robust and suitable for clinical use.

KEYWORDS

tissue-engineering, buccal mucosa, substitution urethroplasty

BJU International 2004; 93:807-811

Tissue-engineered oral mucosa graft urethroplasty

Fahlenkamp D, Barbagli G, Romano G, Lazzeri M

Dresda - Chemnitz - Germany

December 8 - 2010

Center for Reconstructive Urethral Surgery

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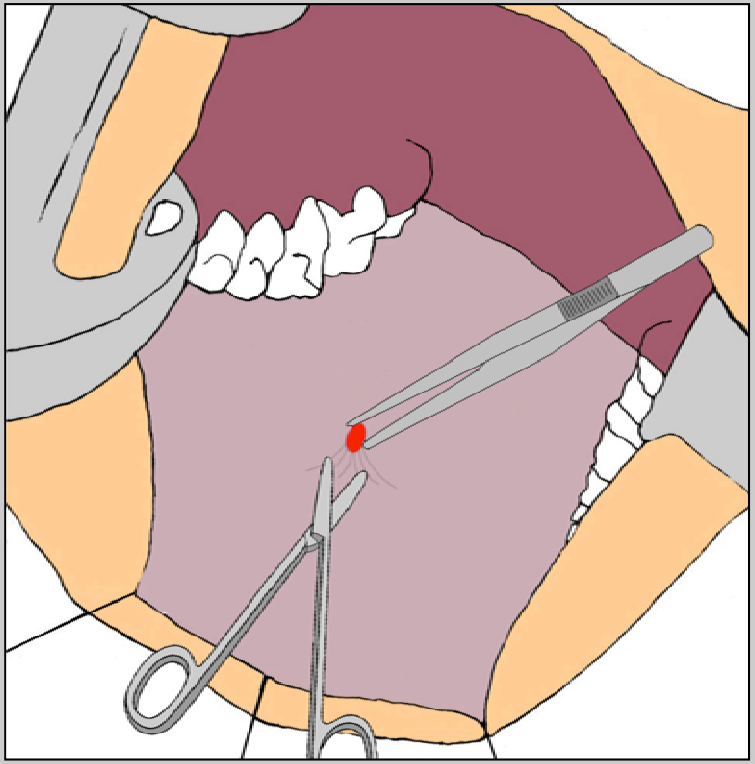
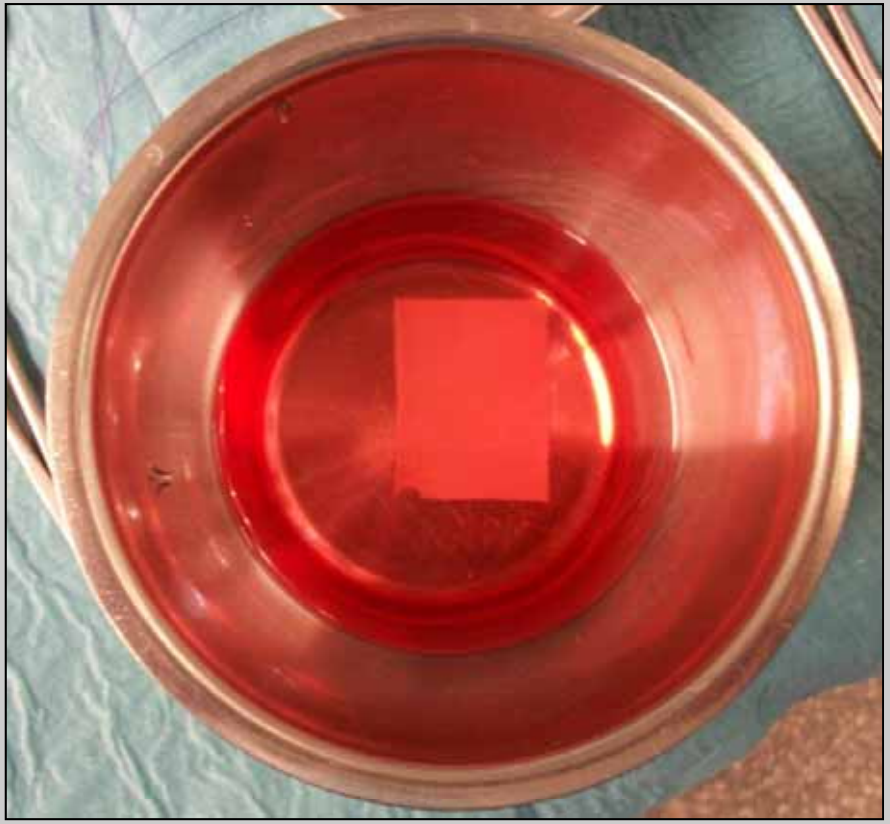
The tissue-engineered oral mucosa graft urethroplasty was performed (in two patients) at the Department of Urology in Chemnitz (Germany), under the direction of Prof. Dirk Falhenkam

The tissue-engineered oral mucosa graft was arranged in laboratory in Dresda (Germany), one of the most advanced pharmaceutical clean room facilities for manufacturing of cell-based medicinal products according to "Good Manufacturing Practice" (GMP)



A tiny oral mucosa biopsy is taken from the mouth of the patient and sent to the certified cell culture laboratory

The new graft production is a validated procedure and takes about 3 weeks. During this time, cells are isolated from the biopsy, expanded and cultured on the surface of a collagen scaffold



Patients's own oral mucosal construct is then packed in a sterile container and sent to the hospital, where it can be implanted into patient, undergoing urethral reconstruction surgery

Bulbar urethroplasty with dorsal inlay of tissue engineeed oral mucosa graft

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Pre-operative retrograde urethrography

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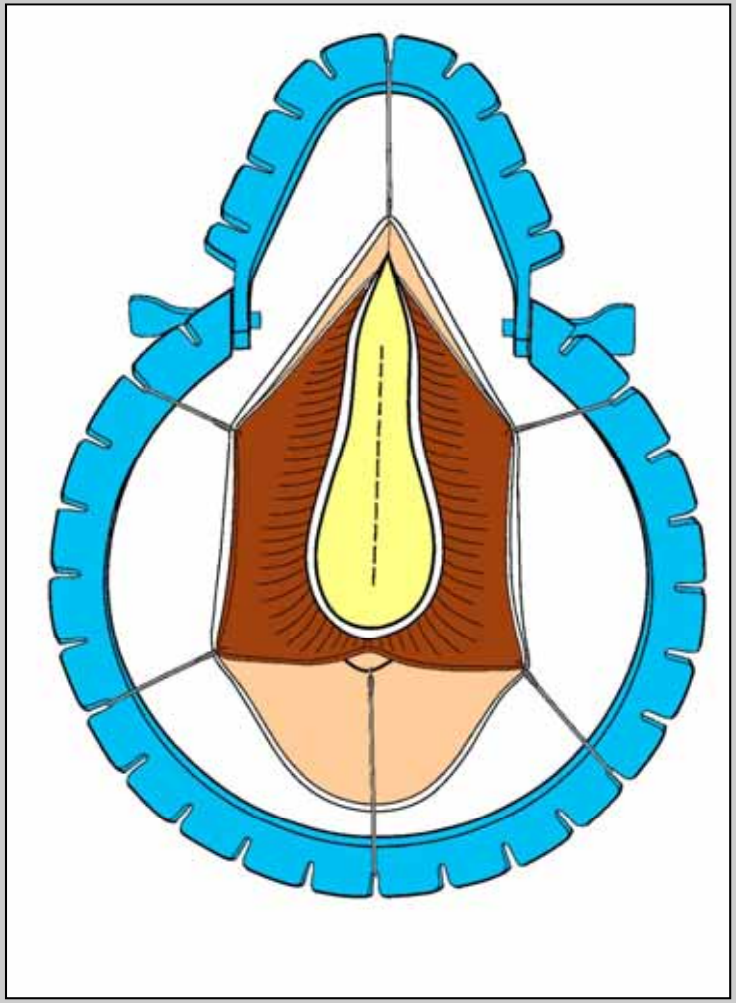
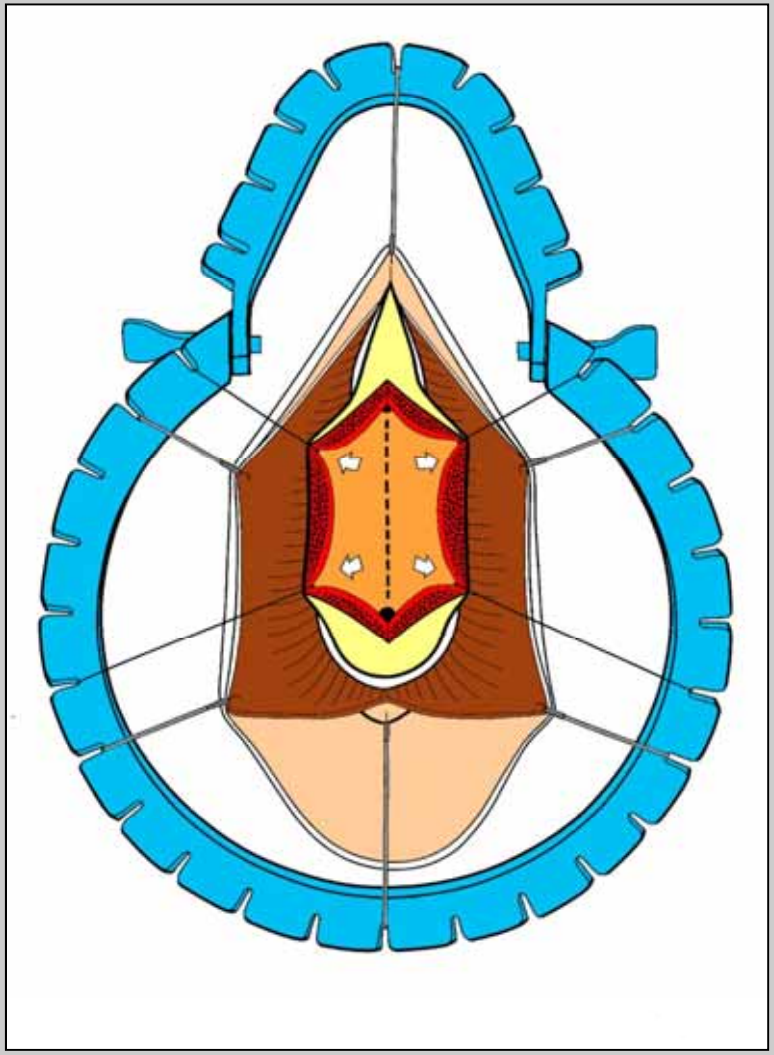


The bulbar urethra is opened along its ventral surface



The urethral plate is longitudinally incised

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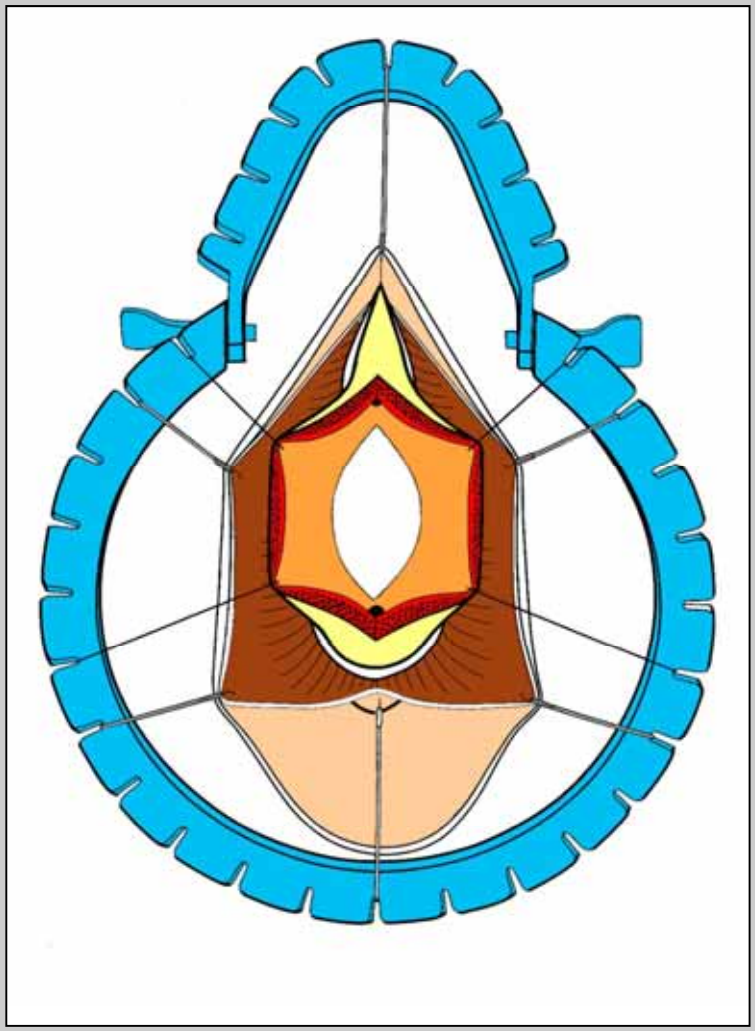

The urethral plate is longitudinally incised to obtain a wide window

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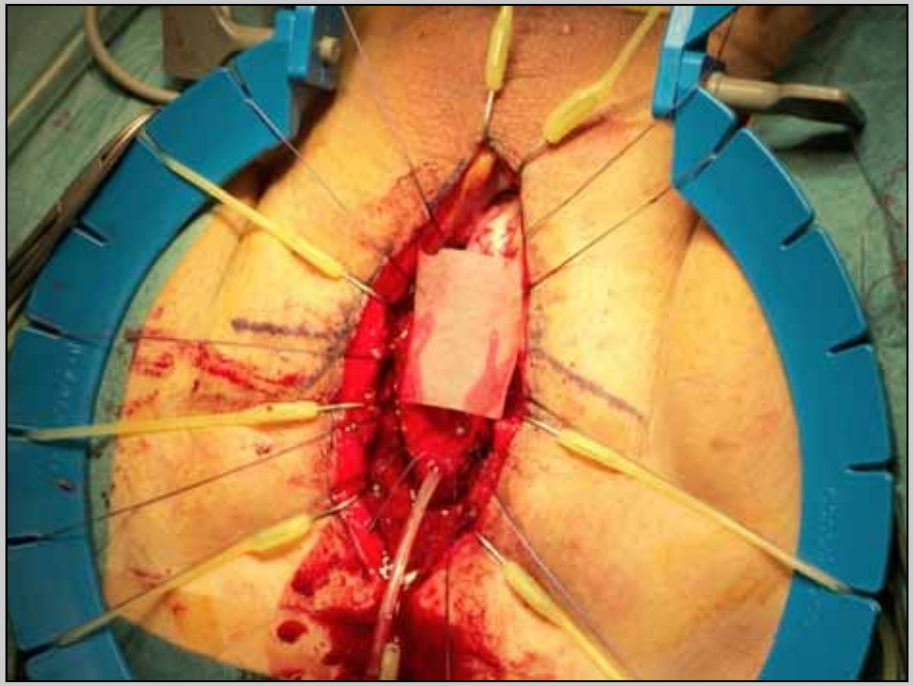
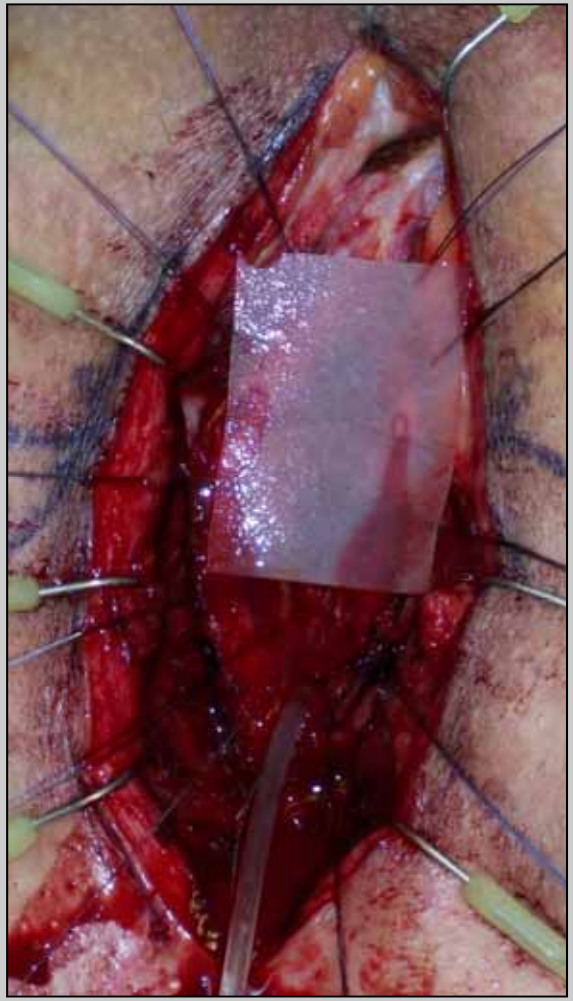
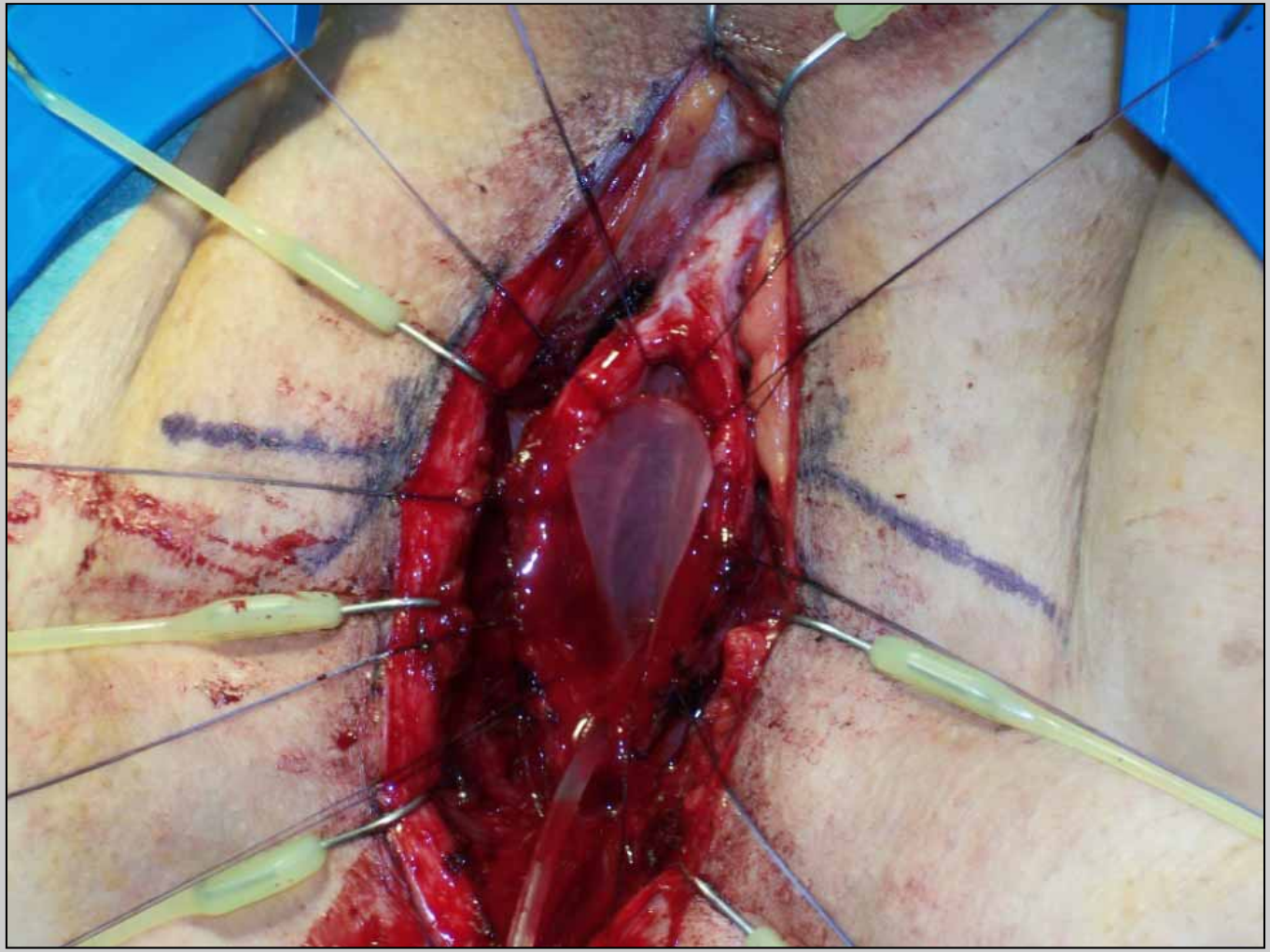




The tissue engineered oral graft is ready for the transplant into the urethra



The tissue engineered oral graft is layed carefully on the window created in the urethral plate

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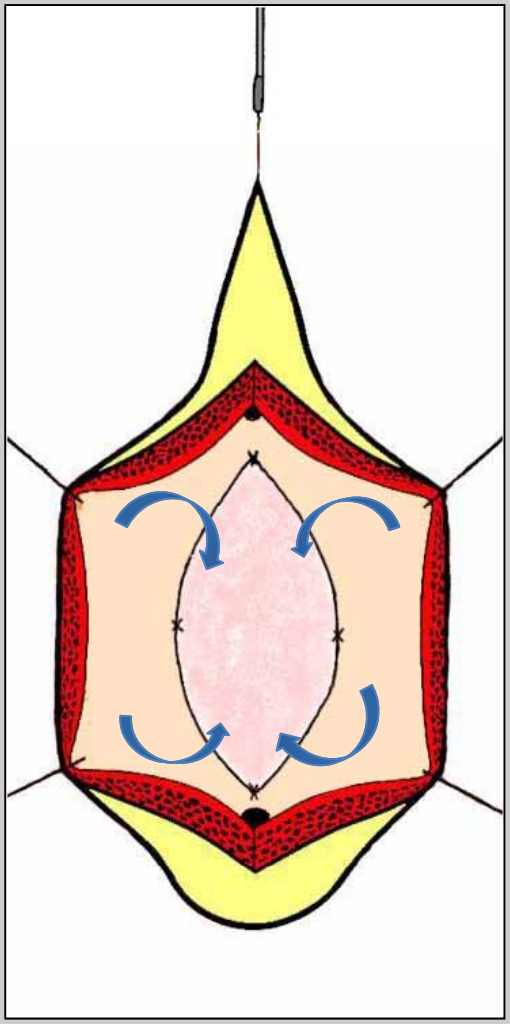
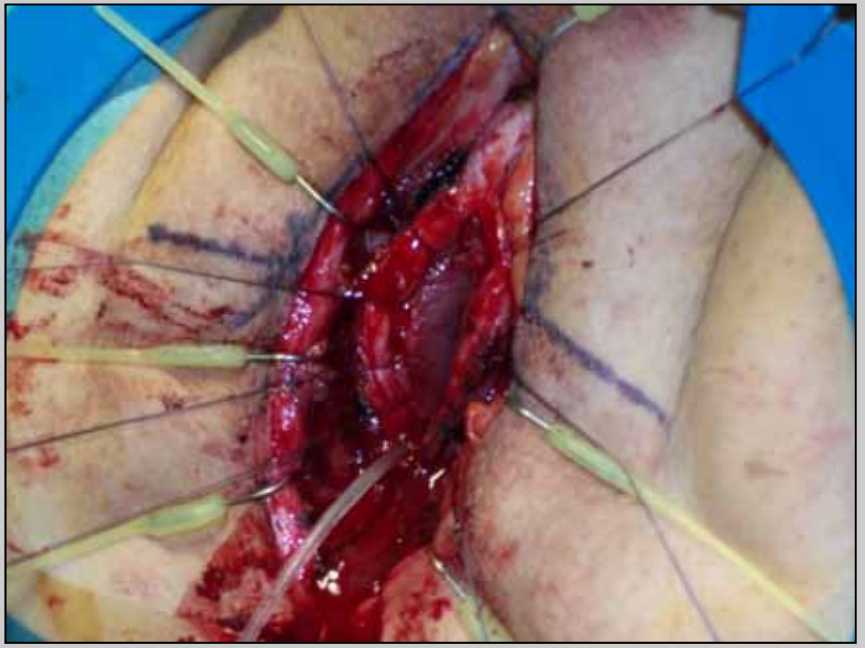
The tissue engineered oral graft is tailored according to the size of window creted into the original urethral mucosal plate





The tissue engineered oral graft is sutured and quilted deeply into the urethral plate window

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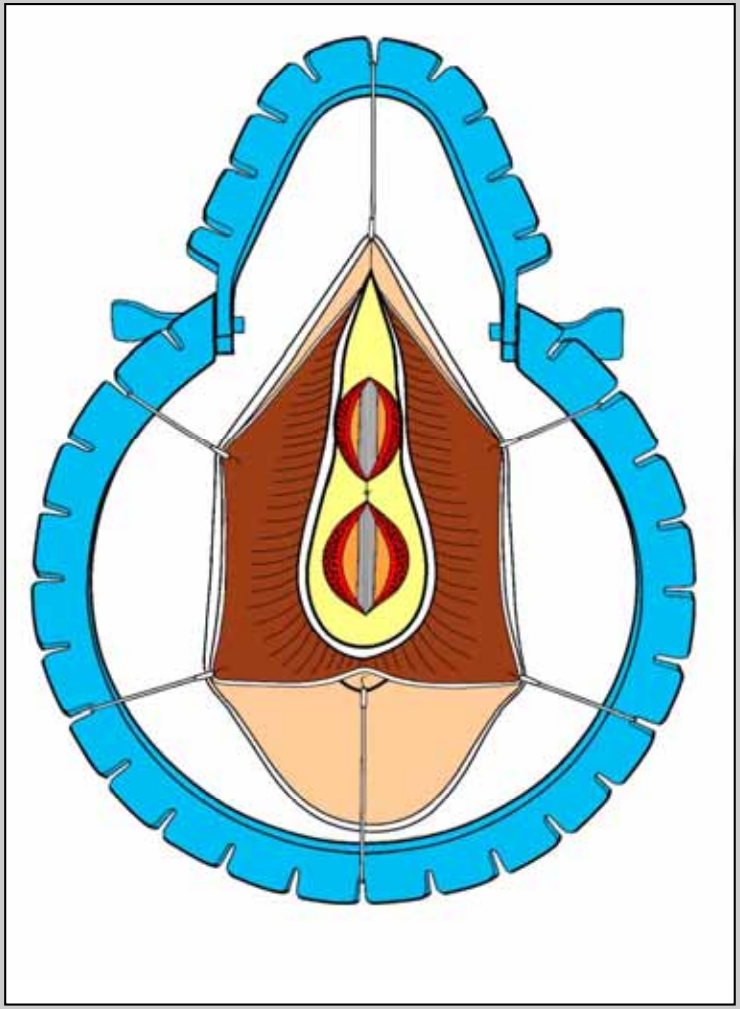

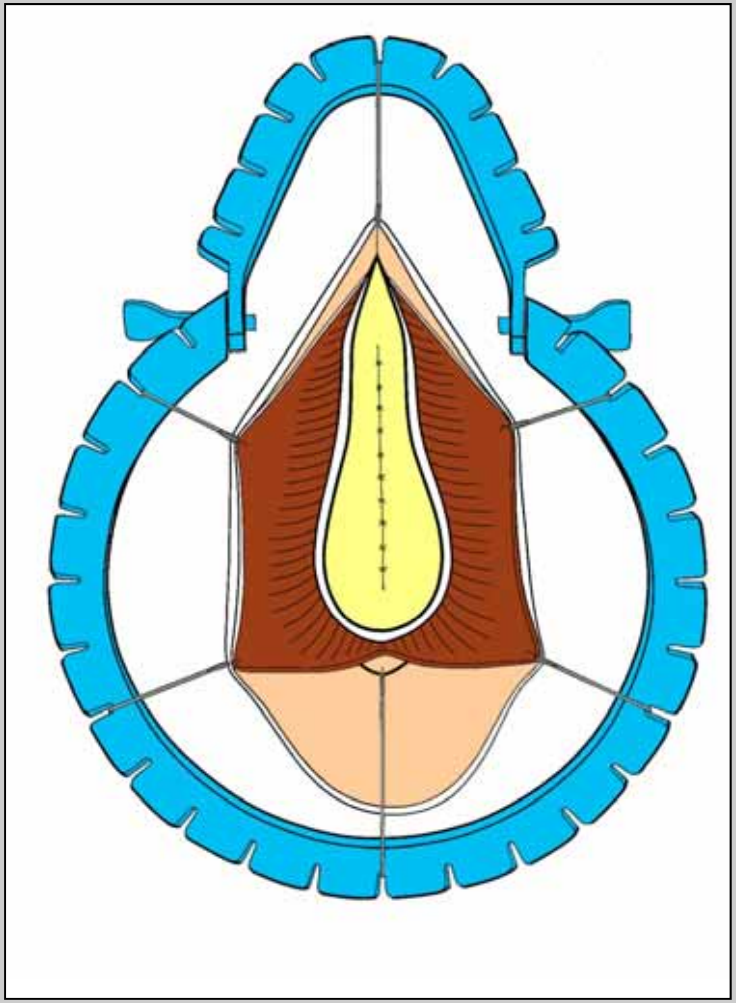

The bulbar urethra is closed over 16 Ch Foley silicone catheter

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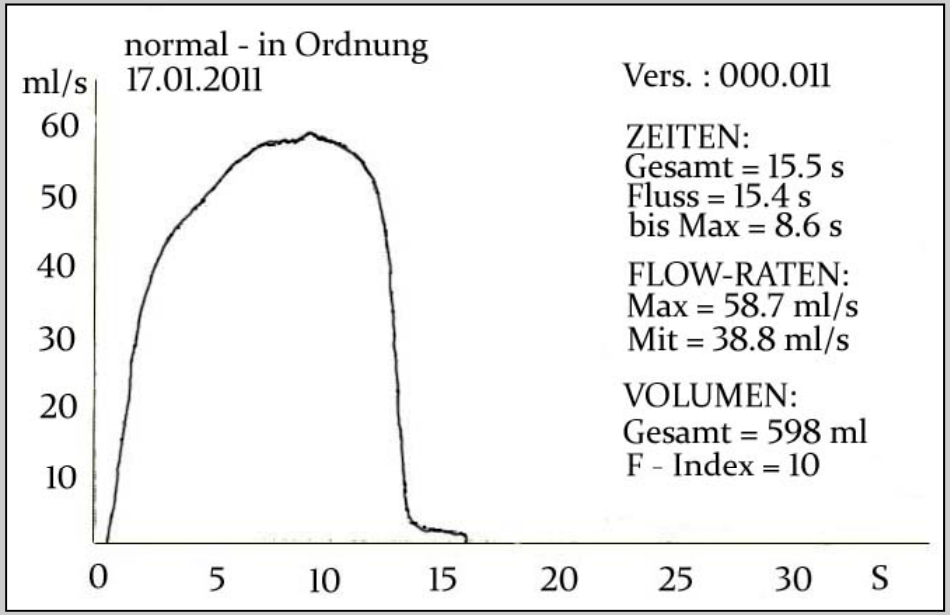

Four weeks after urethroplasty uroflowmetry and urethrography is made

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This tissue-engineered oral mucosa graft urethroplasty

will be soon ready at our Center,

the first Center selected for using this product in Italy

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Our preliminary experience

The oral mucosa coming from laboratory is significantly different from the oral mucosa coming from the mouth of patient

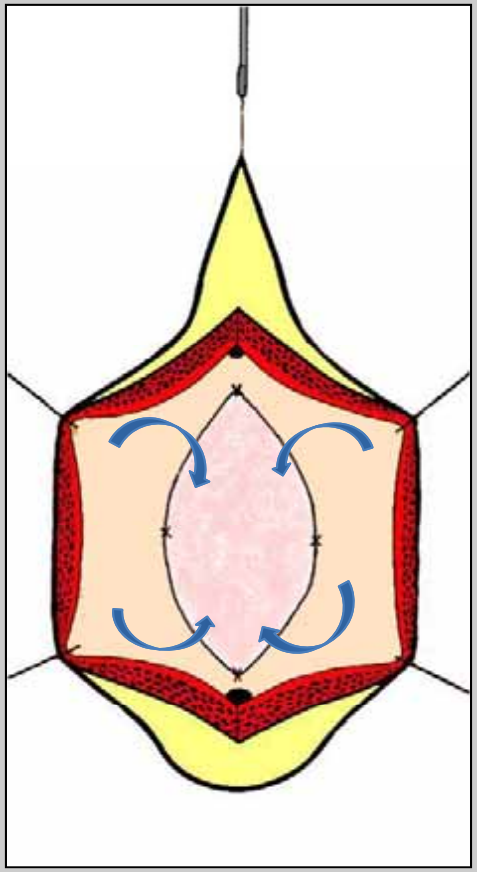
Our preliminary experience

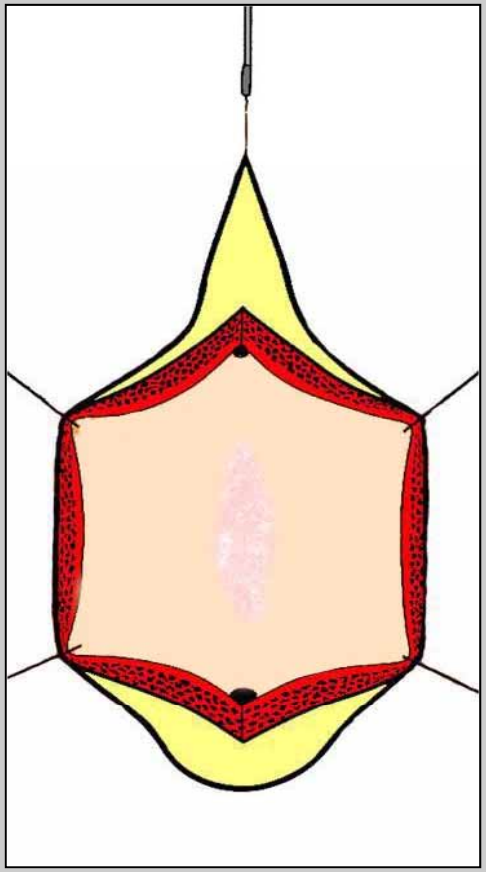
?

The oral mucosa coming from laboratory is probably

not adaptable for any type of urethroplasty

Our preliminary experience

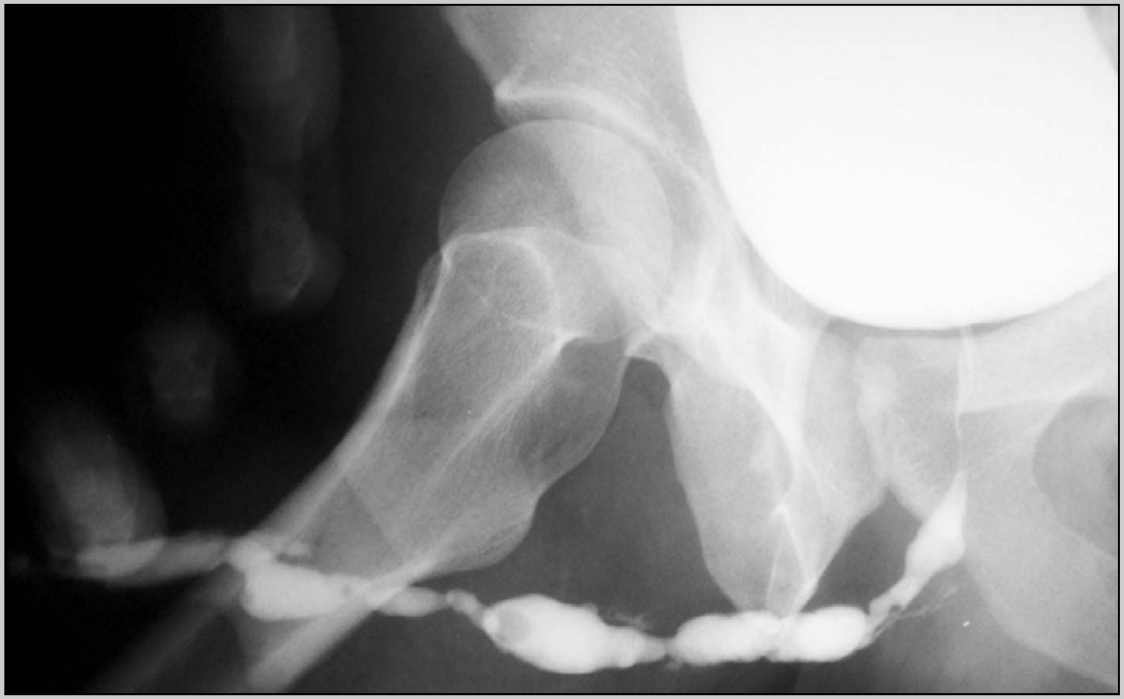




At present, the use of oral mucosa coming from laboratory is not a common surgical procedure and should be performed only in a Centre of excellence for urethral surgery

e-mail: info@urethralcenter.it website: www.urethralcenter.it

Our preliminary experience



Further studies in a large series of patients, with extended follow-up, are now necessary to investigate if and how the oral mucosa coming from laboratory could be used in patient with complex urethral stricture

Urethral surgery will have improved only when corpus spongiosum is made available, and a new spongiosum-made urethra can be transplanted in the patient