COMPLEX RECONSTRUCTIONS IN HYPOSPADIAS:

- Penile straightening

- Penile lengthening

- Glans and penile skin resurfacing

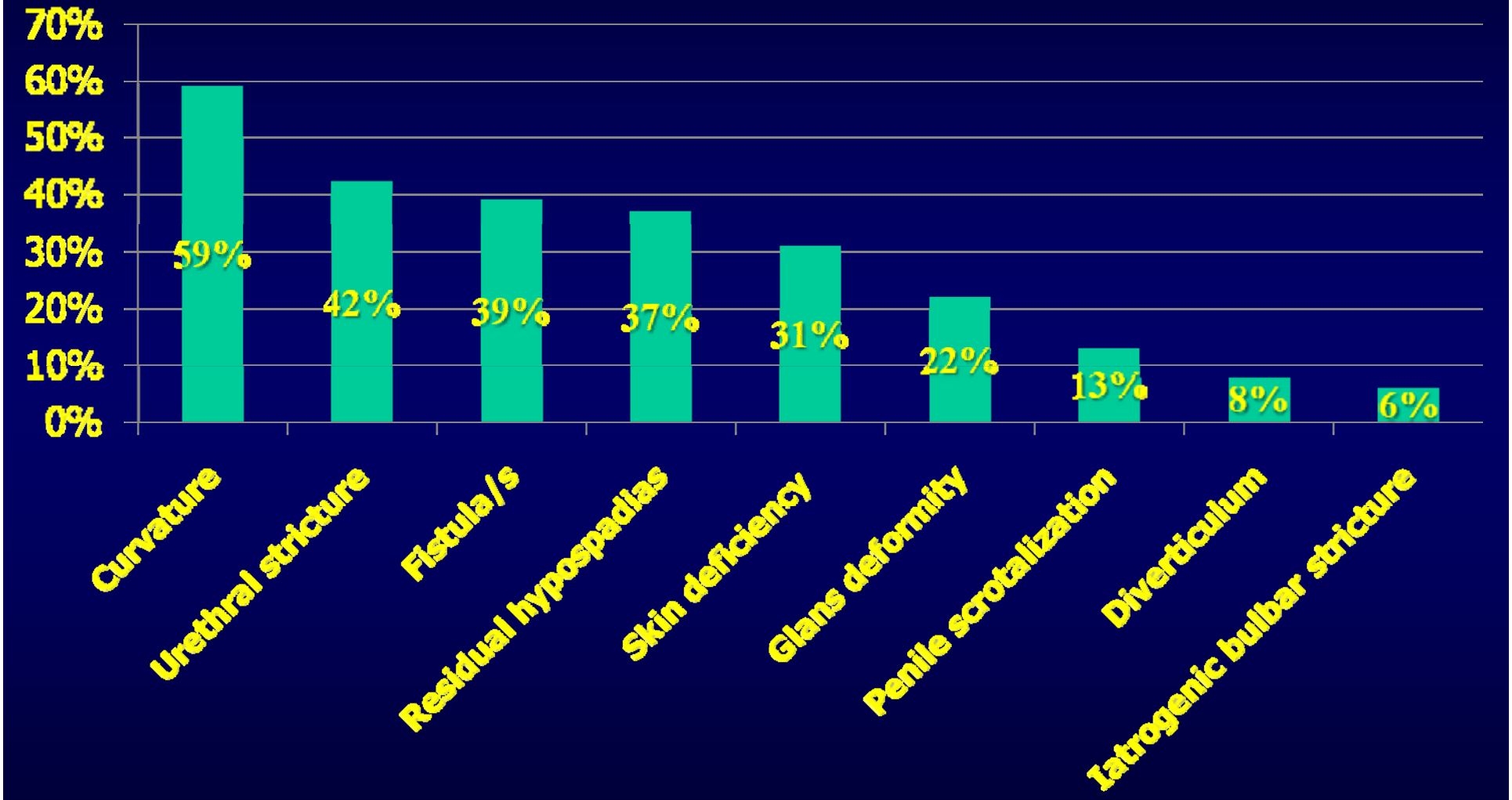
Rados P. Djinovic,
Belgrade

- Growing number of adult patients
- Majority had multiple previous surgeries
- Unsatisfactory functional and esthetic appearance

LATE OUTCOMES OF HYPOSPADIAS REPAIR

SOME BIZARRE “FREE-ART” OUTCOMES…

CLINICAL AND SURGICAL ASSESEMENT of FAILED HYPOSPADIAS*



*Great majority of patients presented with more than one complication

CAUSES of FAILURES

- High variability of anomaly
- Inappropriate understanding of anomaly
- Small and delicate structures – microsurgical principles
- Complex surgery: > 300 described techniques and modifications

- Surgical scars do not follow penile growth
- Inexperienced surgeons
- Pediatric surgeons – short-term follow-up
- Adult urologist – lack of proper training

- **Complexity of penile anatomy – different structures in a small space**

- **Problems in adults:**
  - **Erection**
  - **Ejaculation**
  - **Urethral discharge**

- **Quality of available skin**
  - **blood supply, elasticity**

SURGICAL TREATMENT

- Careful dissection
- Reconstruction

"In all cases of reparative surgery, in which the defect is congenital, the aim of the surgeon should be to restore all parts to their normal relations as nearly as possible"

Frank V Cantwell M.D.

Annals of Surgery 22:689-694 **1895. !!!**

Problems that should be faced in salvage procedure

- Curvature
- Urethra
- Glans
- Penile skin
- Scrotum

CHOICE OF REPAIR

- Clinical and intra-operative findings
- Individual approach
- Familiarity with all available techniques
- Preference of the surgeon must not be decisive

PENILE CURVATURE

- One of the most important features of hypospadias
- Curvature checking is mandatory
- Corporal disproportion is present in majority of hypospadias

CAUSES

- **Short ventral skin**
- **Subcutaneous tethering**
- **Short urethra**
- **Corporal disproportion** (most common)

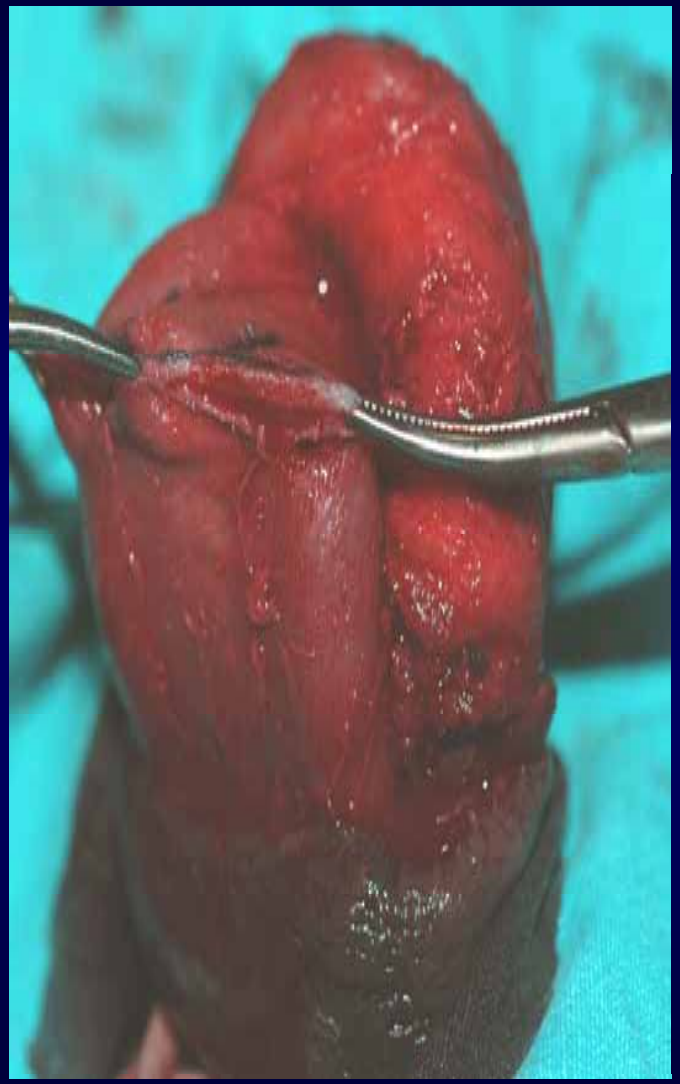
PENILE STRAIGHTENING

- Penile skin degloving
- Excision of fibrotic dartos and Buck's fascia
- Urethral/urethral plate mobilization
- Urethral/Urethral plate division

SHORTENING PROCEDURE

- **Plicational or excisional technique**
- **Indications:** Normal penile size and small curvature, glans tilt
- **Multiple small incisions/excisions - better corporal sculpturing**
- **Continuous suture** (PDS, Maxon), **3-0 in adults and 5-0 in children**

Residual chordee – Incomplete disassembly with incisional corporoplasty

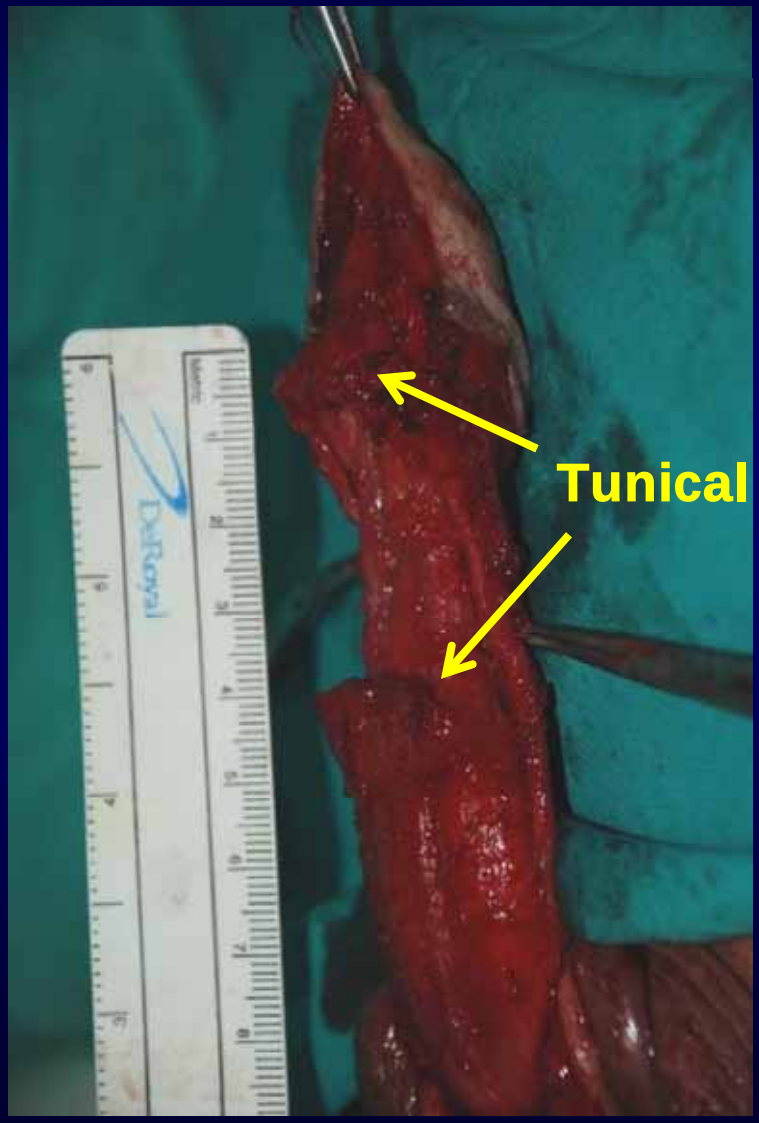



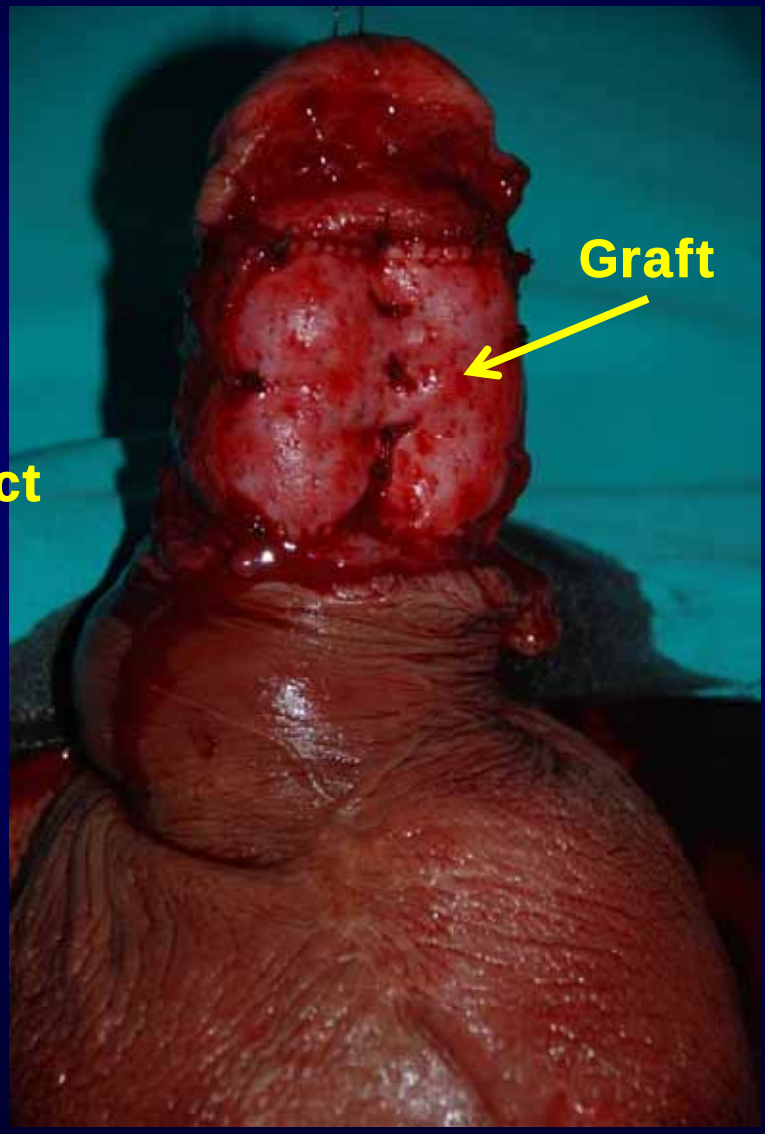

LENGTHENING PROCEDURES

- **Ventral albugineal grafting**
  - Severe curvature and small penis
- **Tunical attenuation**

Severe ventral curvature with short neourethra – III stage repair

Ventral grafting with InteXen® (4x8cm) for penile lenghtening



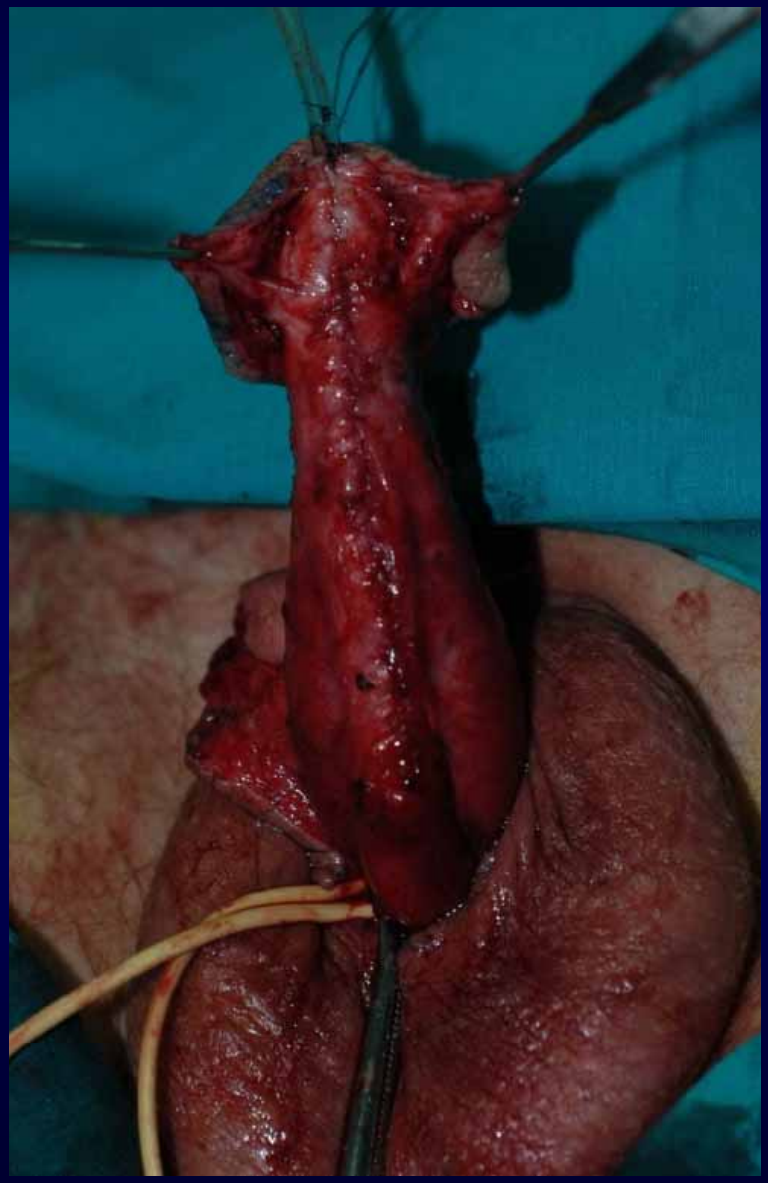


Appearance at the end of surgery with hypospadiac meatus

Urethroplasty – 3rd stage

Urethral tubularization

“Spongioplasty”



Penile skin reconstruction using asymmetrical flaps to avoid overlapping of suture lines

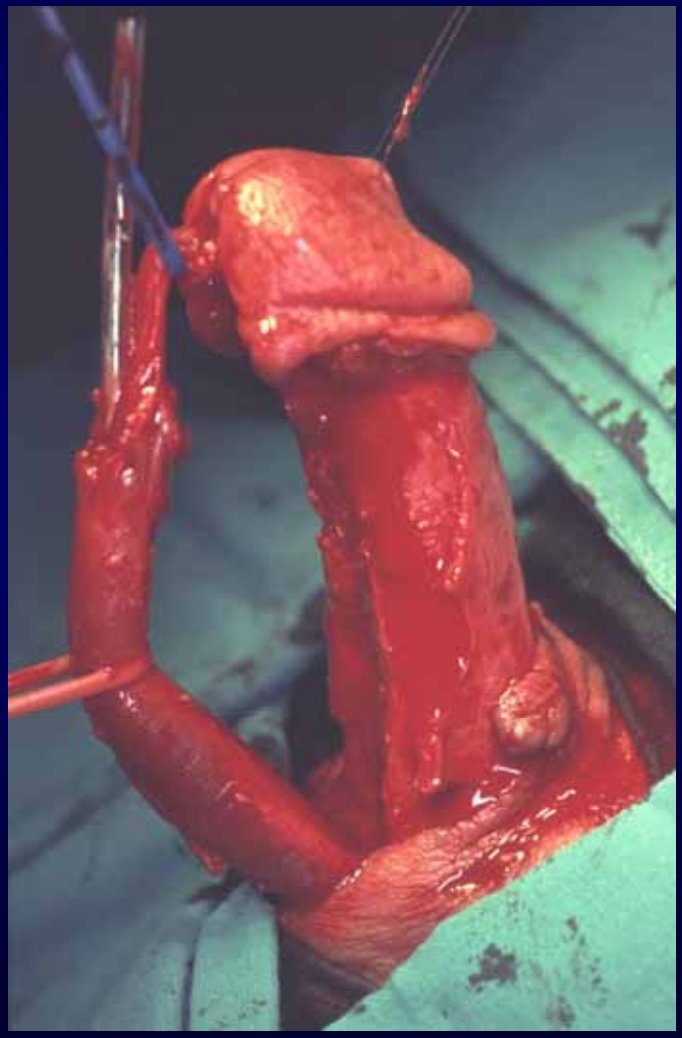
URETHROPLASTY

- **Complex structure** (very delicate epithelium) **and function of the urethra**
- **Urethral plate (if sufficient) is the best available tissue for reconstruction**
- **Buccal mucosa is the best urethral substitute (estimate graft shrinkage)**

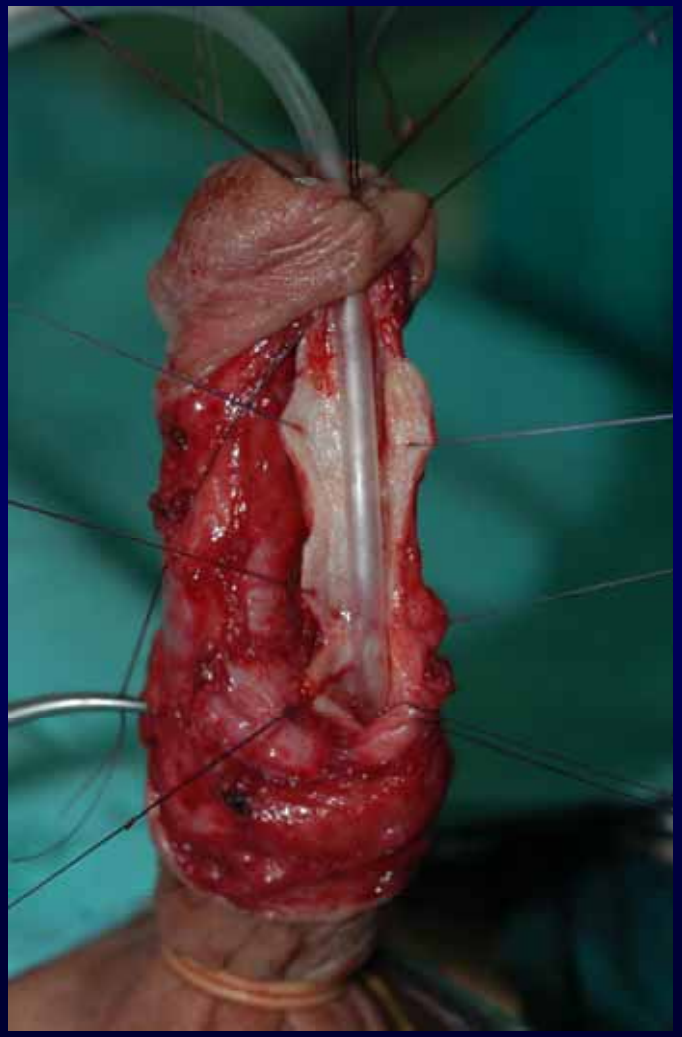
- **Penile / praepucial skin flap is the third choice**
- **Scrotal skin – never!**
- **Tension-free urethroplasty**

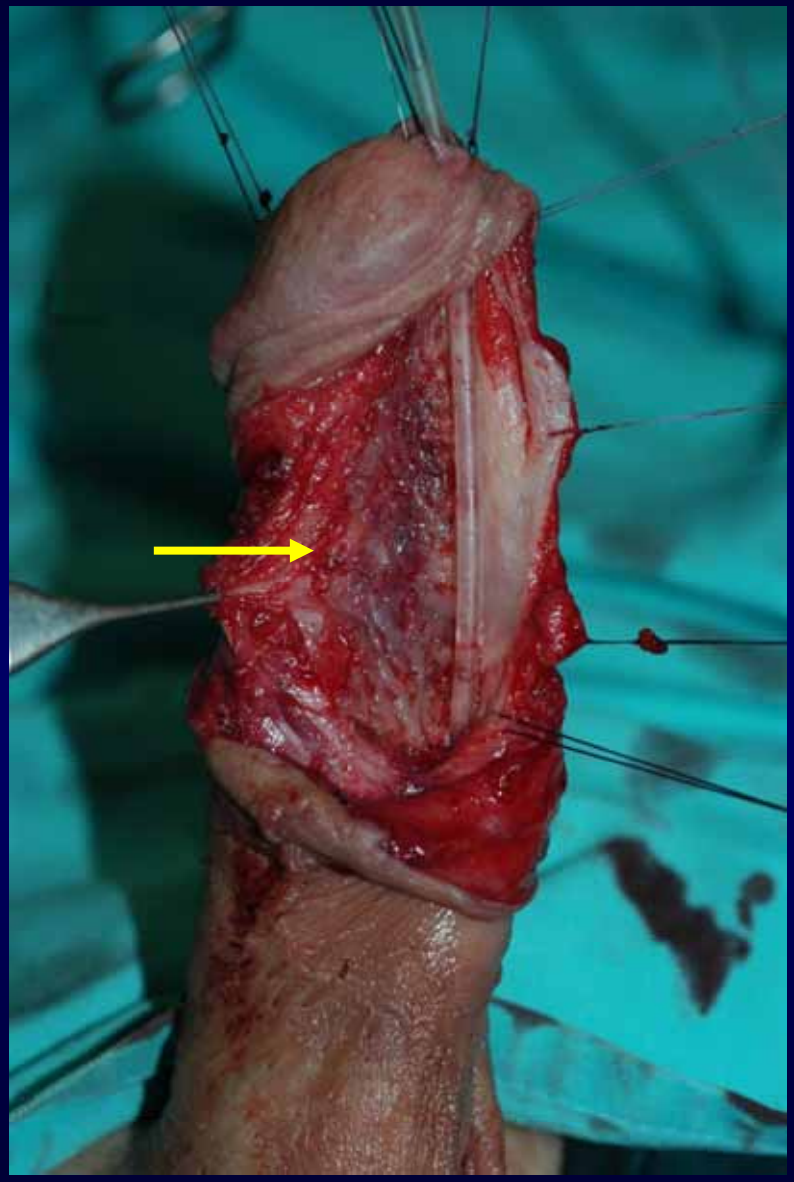
- Avoidance of suture-line overlapping
- Urethral stenting and suprapubic urinary drainage
- Glanular stricture and coronal fistula
- Long endurance

Urethral plate/urethral mobilization with ventral onlay flap urethroplasty



Urethral stenosis 20 years after tubularized flap urethroplasty — Dorsal inlay buccal mucosa graft urethroplasty

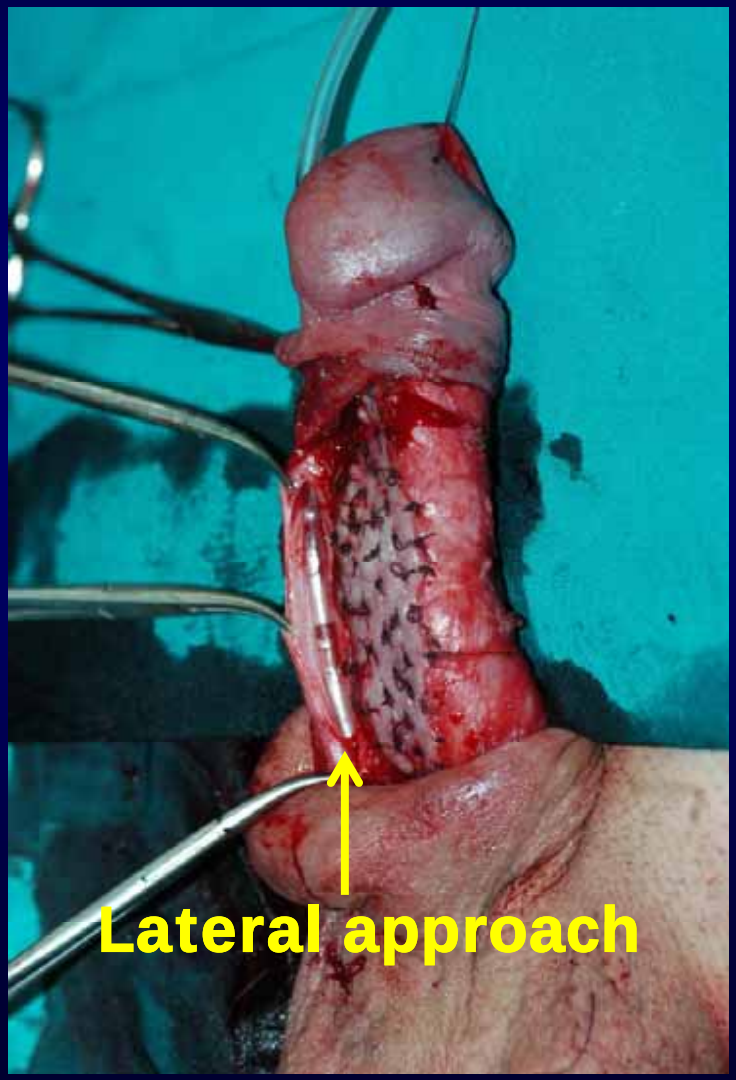


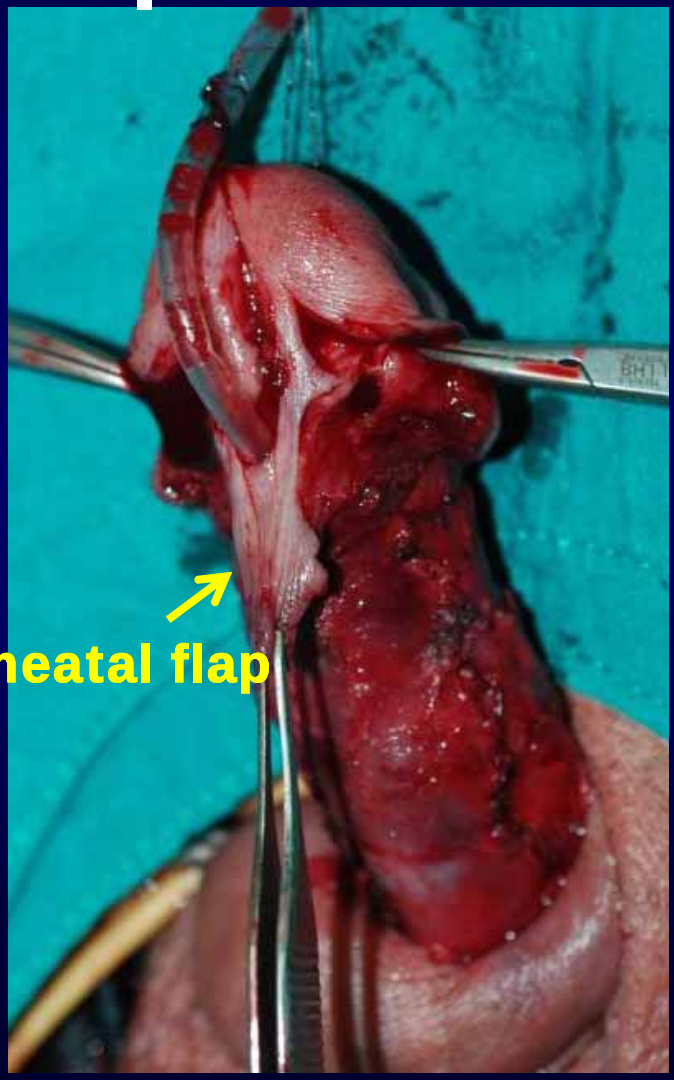


RECURENT PENDULAR URETHRAL STRICTURE – Ventral buccal mucosa onlay quilted on dartos fascia

Urethral stricture -
Dorsal buccal mucosa onlay

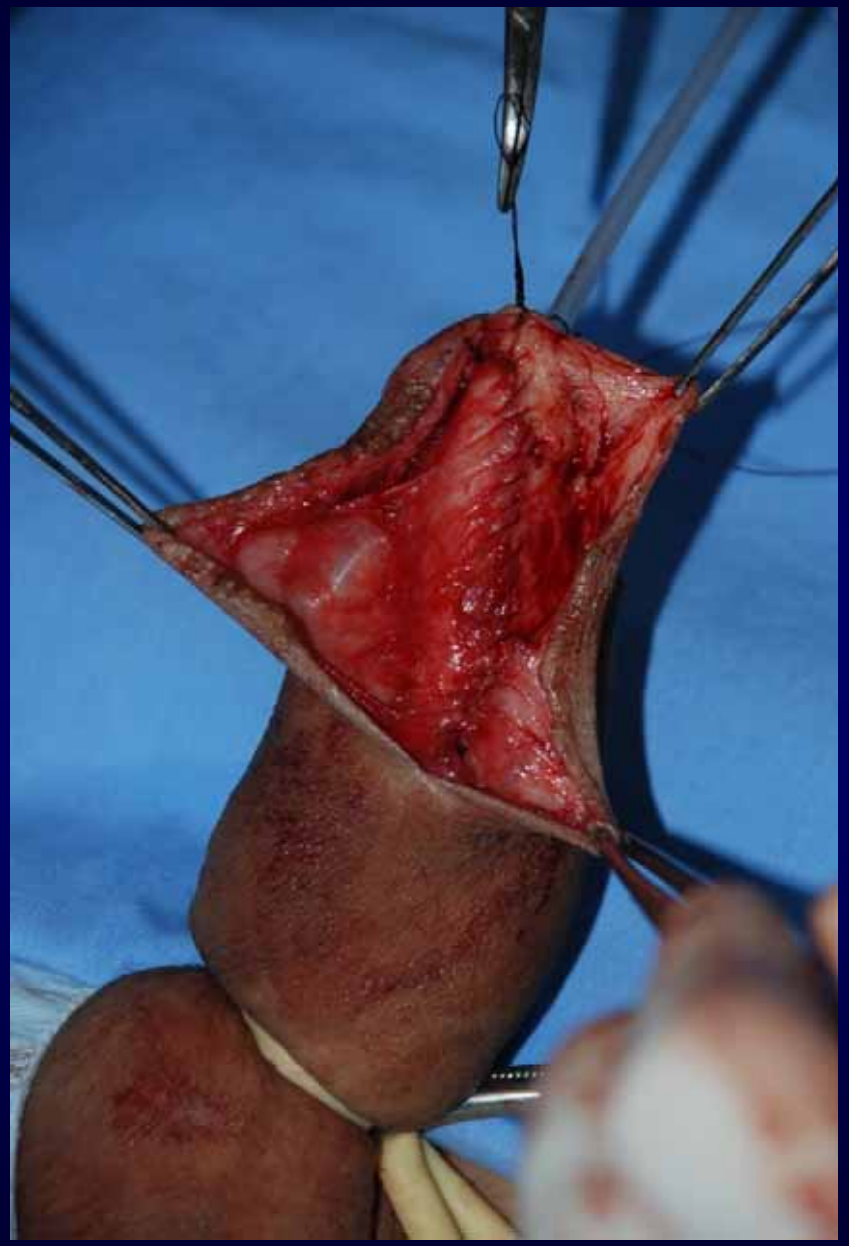
Urethral stricture - Dorsal buccal mucosa onlay combined with submeatal flap





Completed urethroplasty and glans reconstruction

Distal urethral stricture – two-stage repair

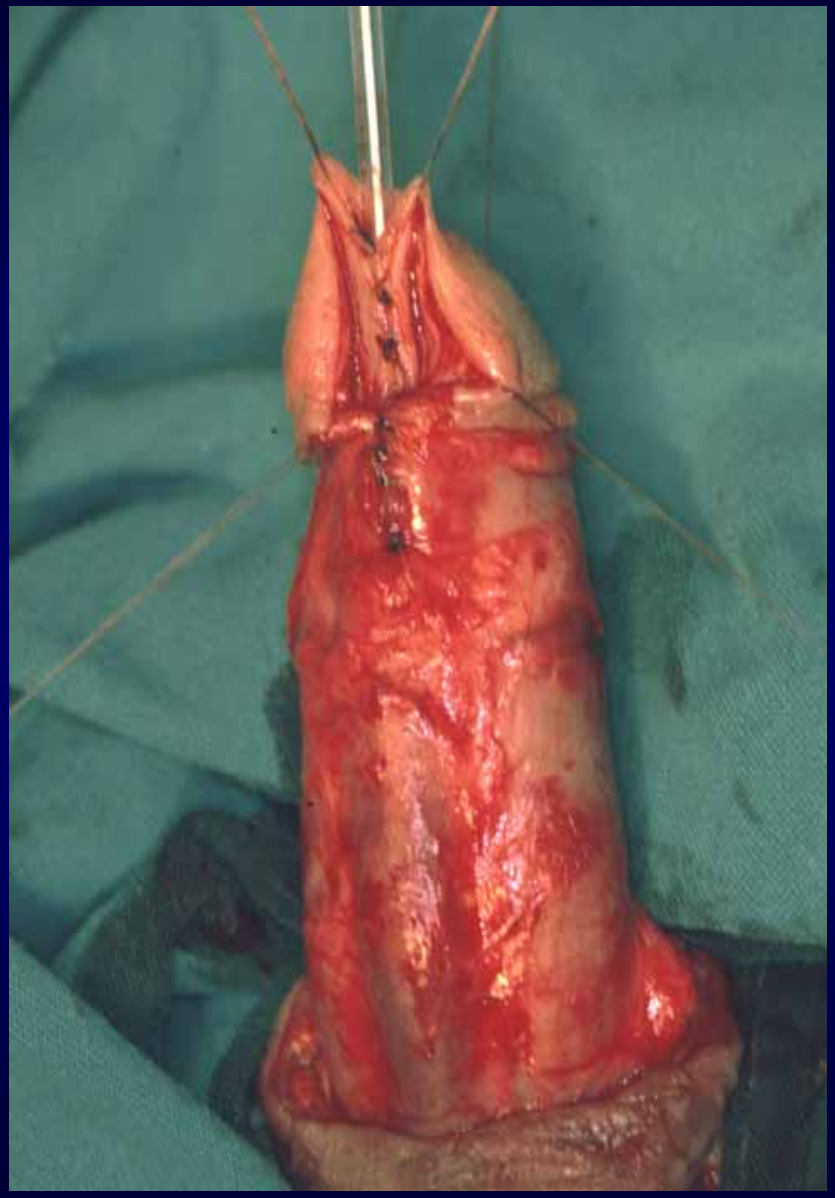


GLANS PLASTY

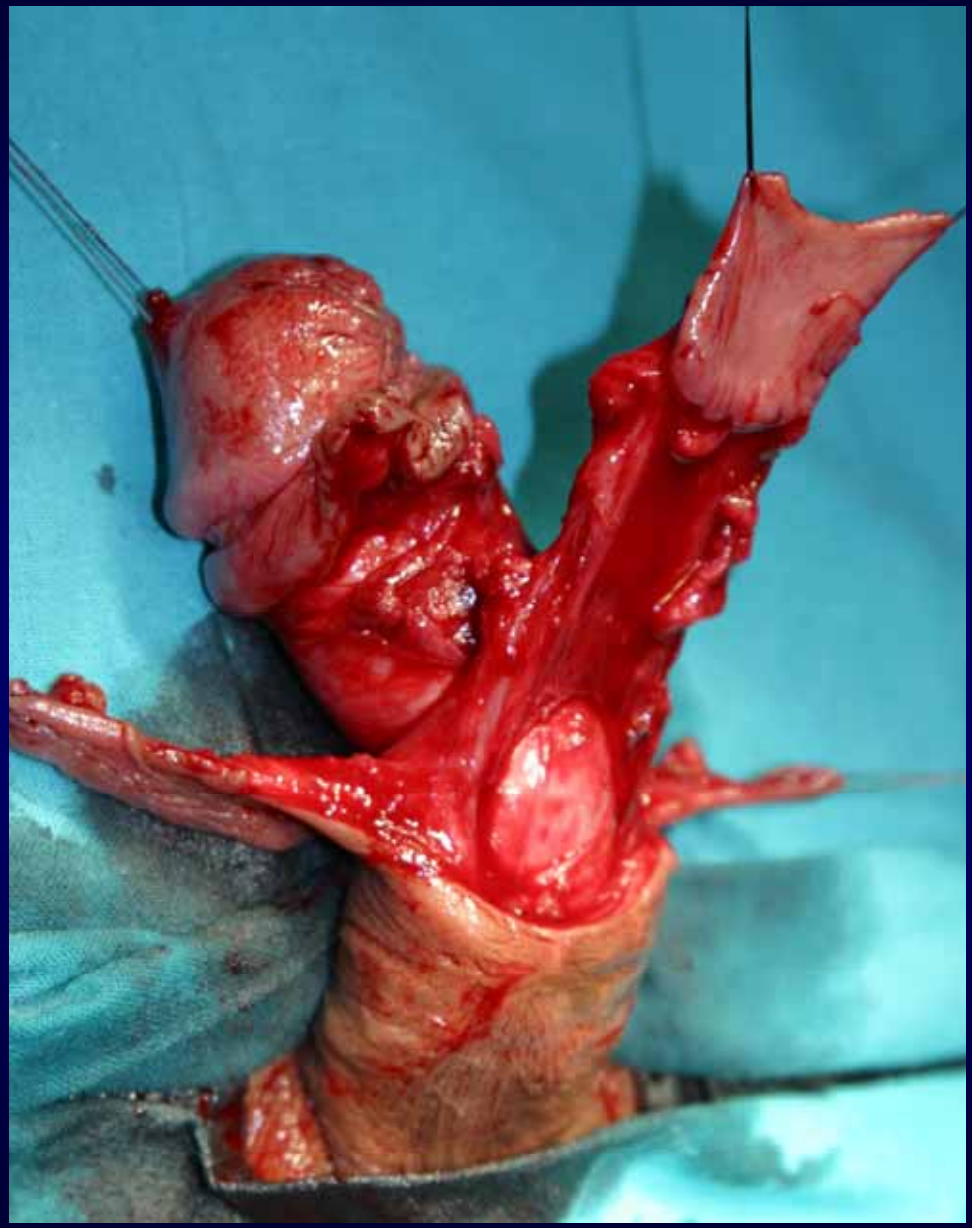
- The most important for esthetic appearance
- Often damaged
- Proper layer of incision and wide glans wings mobilization without impairment of vascularity

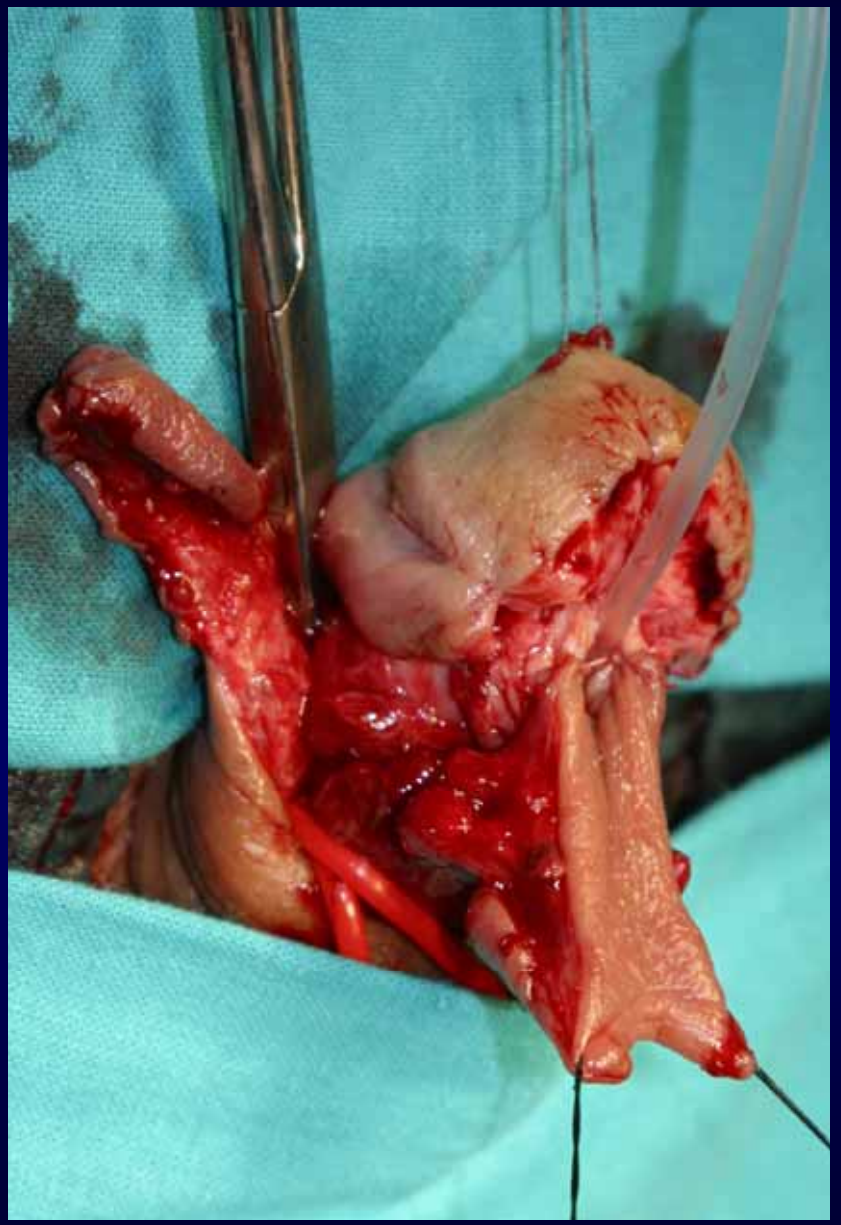
- Tension-free closure – beware of stricture!
- Two-layer delicate closure
- Tension should be controlled by subcutaneous, short-time resorbable suture

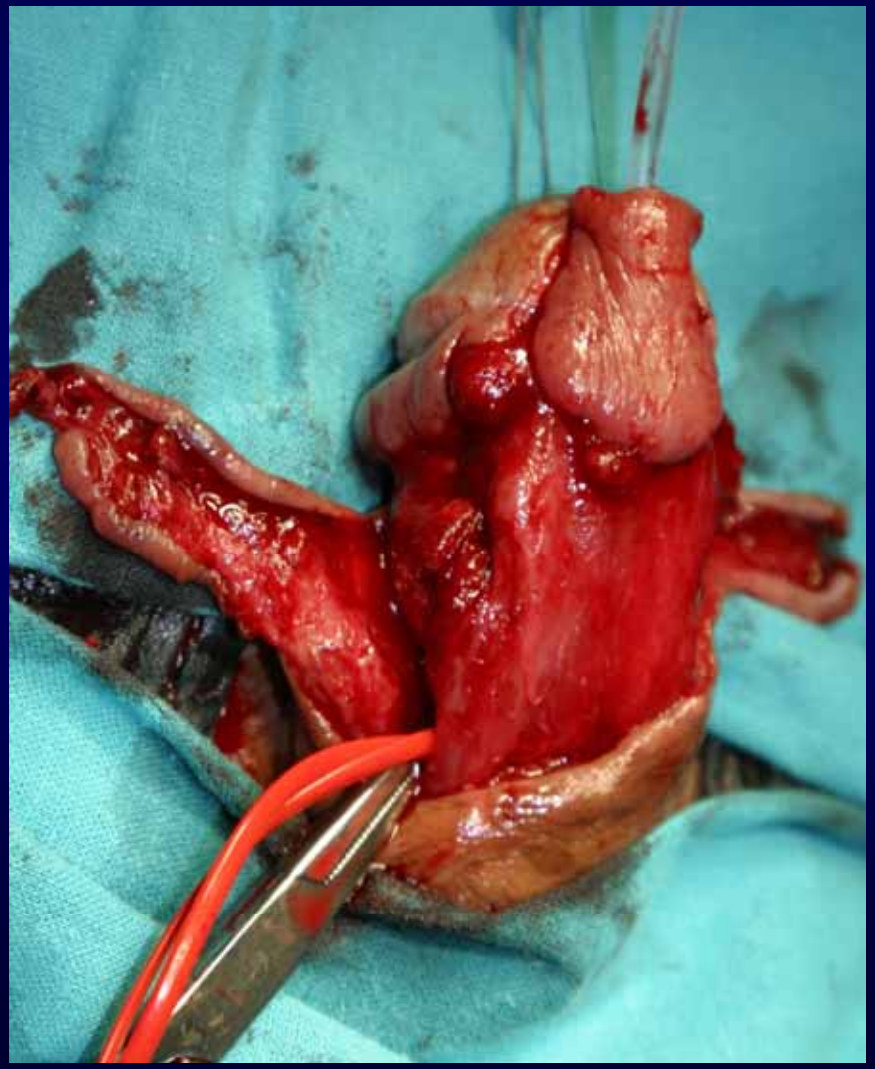
Failed hypospadias repair – Duplay repair with spongioplasty

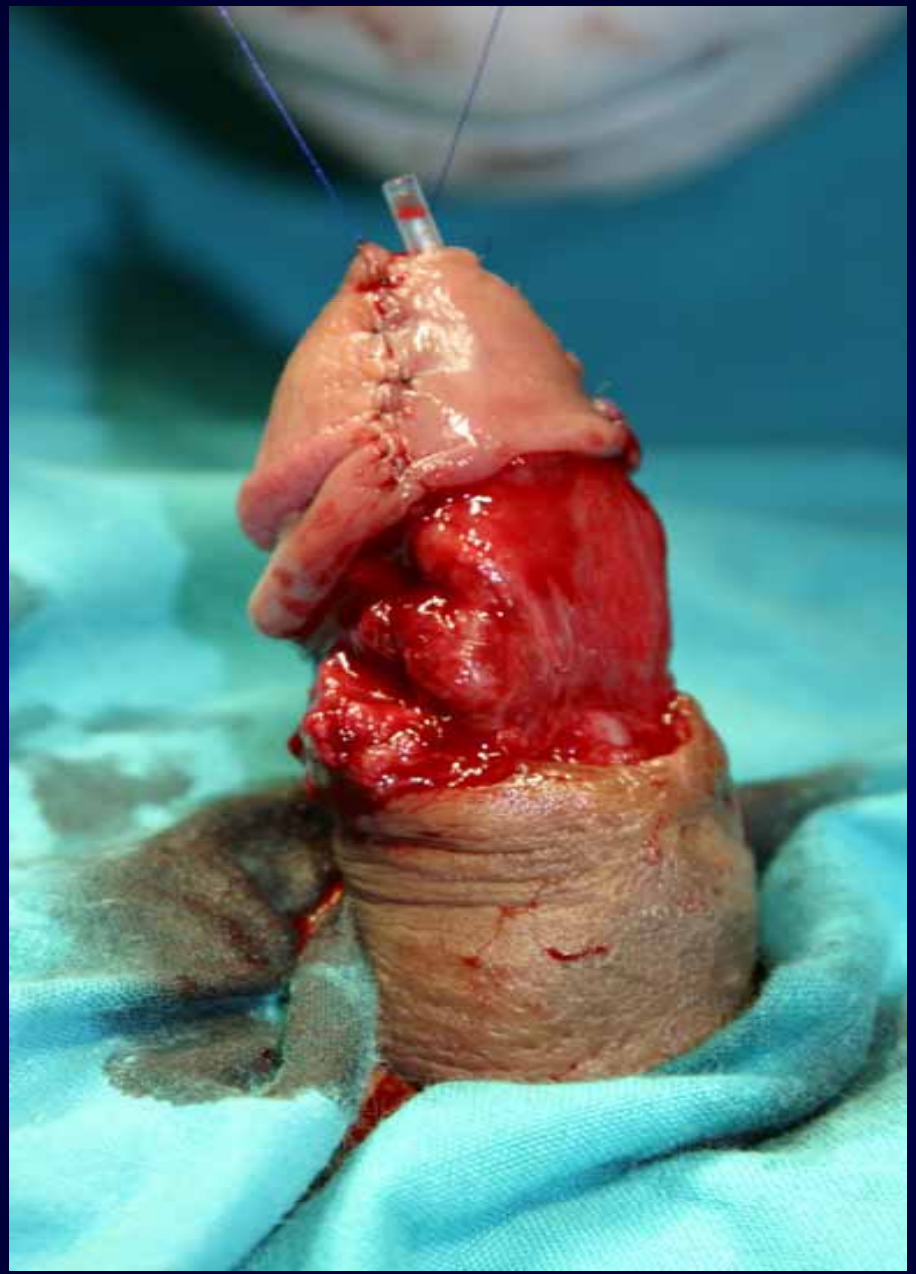


Failed hypospadias repair – Double faced flap urethroplasty









PENILE SKIN RECONSTRUCTION

- Thin, elastic epithelium and dartos fascia
- Usually significantly reduced and scaring
- Wide degloving and mobilization of penile skin with preservation of its vascularization

- **Scrotal skin is the second choice**
  - Proper flap mobilization and separation from testicular fascia
  - Understanding and preserving of scrotal skin vascularity
  - Scrotal hair – usually minor problem
- **Formation of proper peno-scrotal and peno-pubic angle**
- **Tension control by subcutaneous sutures**

Residual curvature with short penile skin – one stage repair

Trapped Penis – Dorsal webbing after hypospadias repair

33-year-old patient with short penile skin

Penile skin reconstruction using remaining penile and scrotal skin

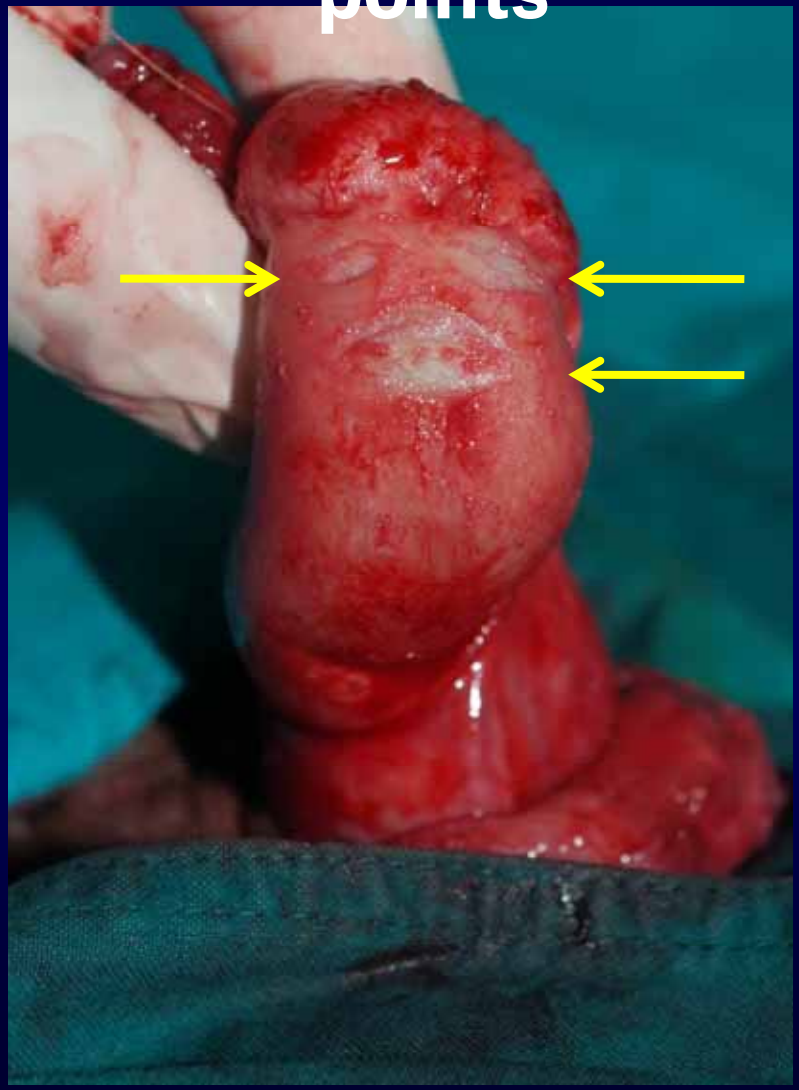
Outcome after 1 year

COMPLEX RECONSTRUCTION

59-year-old patient with 7 previous surgeries - one stage repair

Artificial erection shows severe ventral curvature

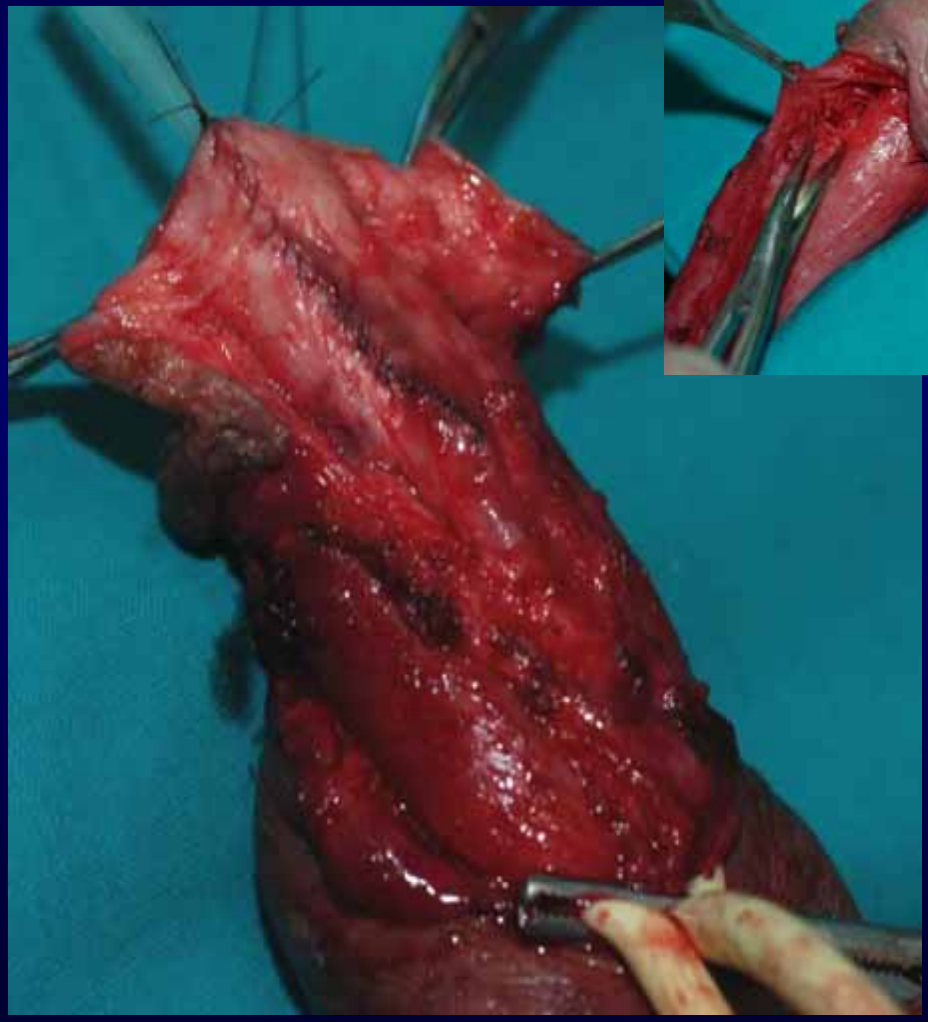
Elipsoid excision of longitudinal layer of albuginea at several points

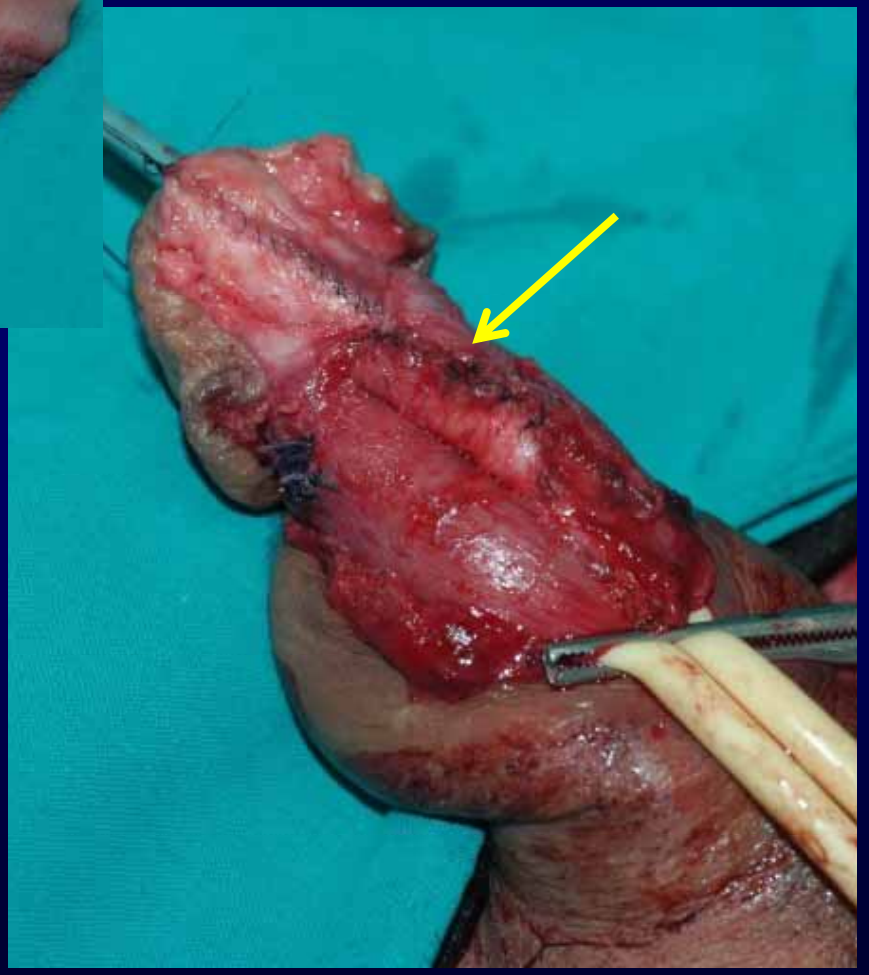


Running suturing of wounded surfaces (PDS 3-0)

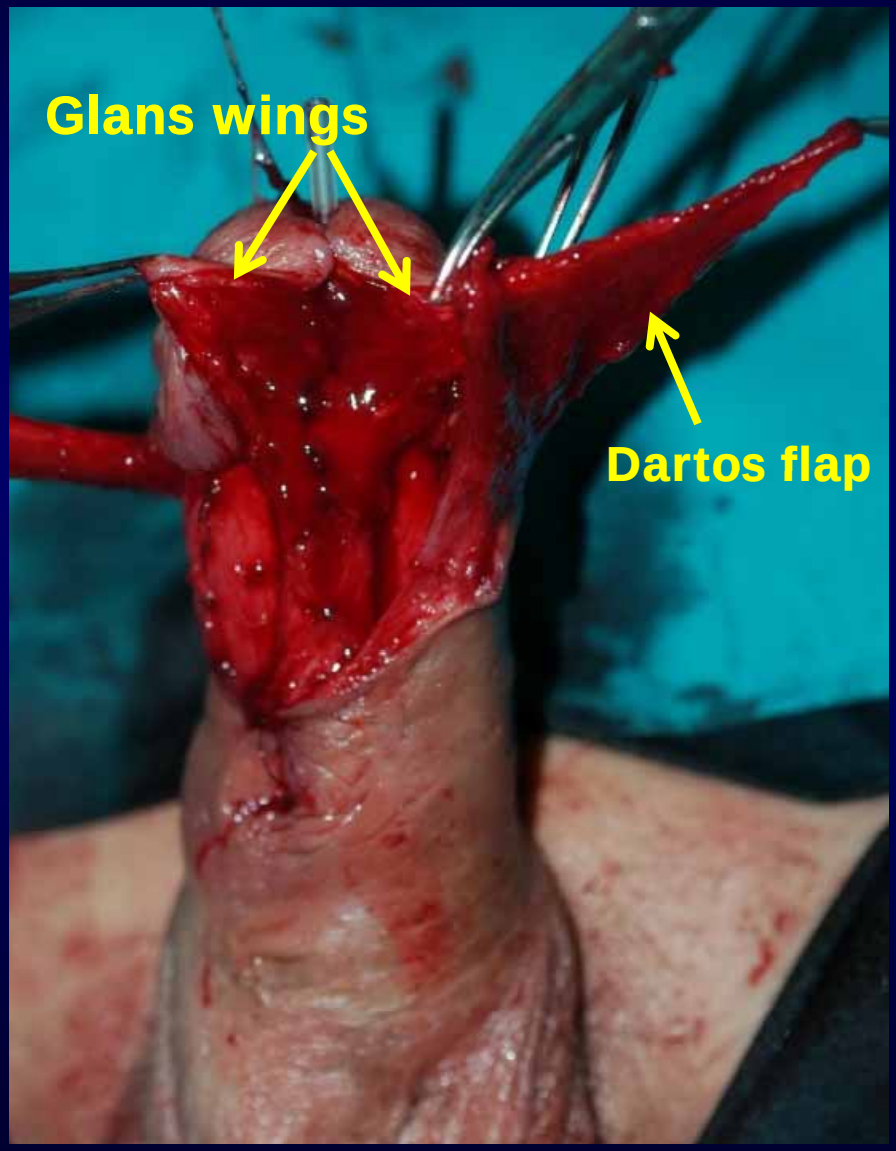
Complete penile straightening

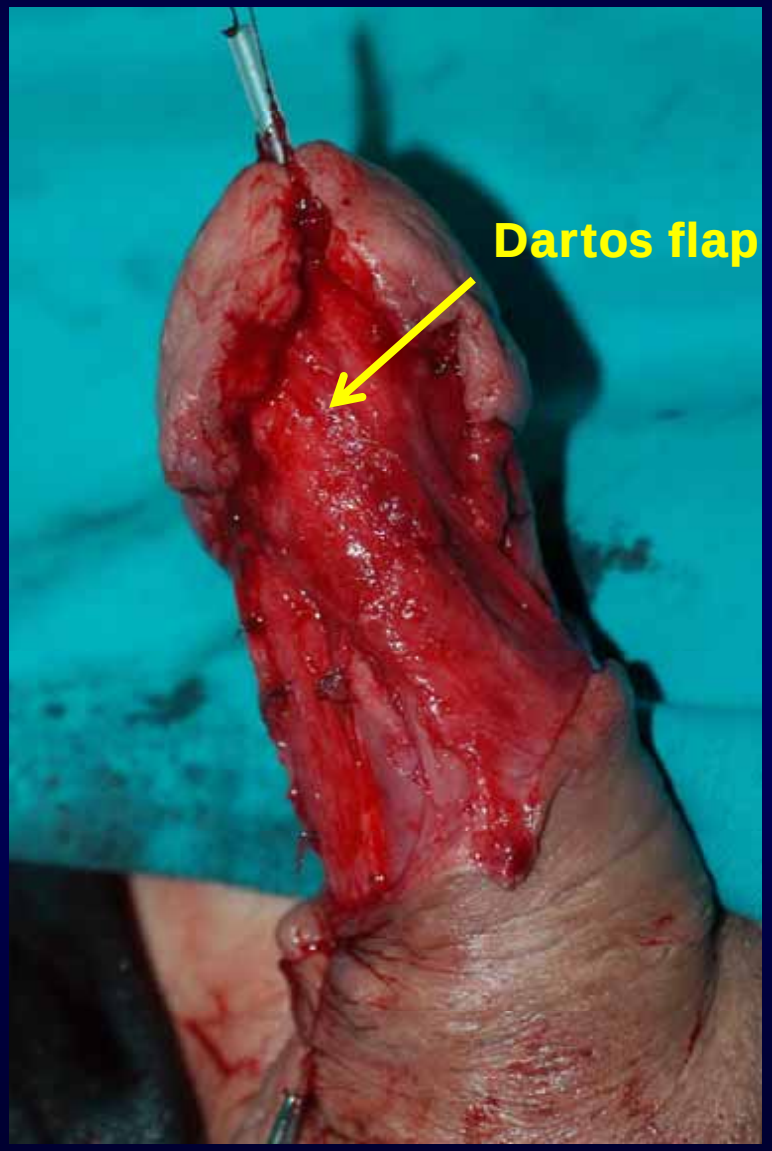
Neourethral reconstruction and “spongioplasty” (arrow)





Creation of abundant dartos flap for suture line covering (arrows)





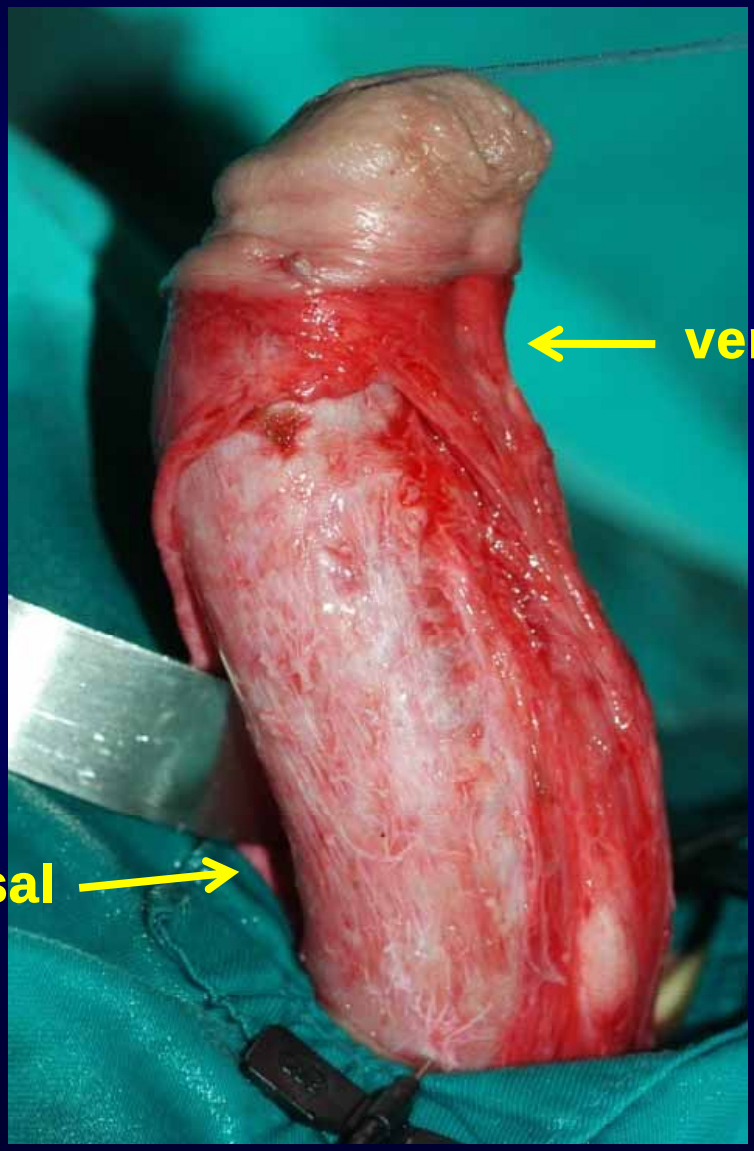
Aspect at the end of surgery

Outcome after one year

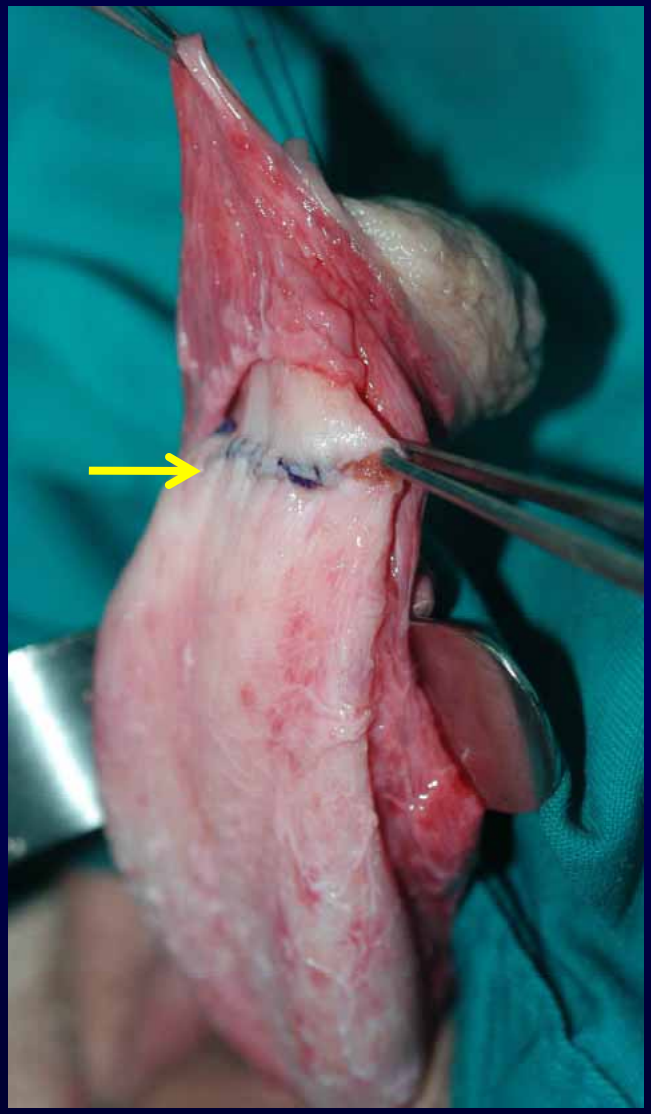
34-year-old patient with 6 previous surgeries - one stage repair

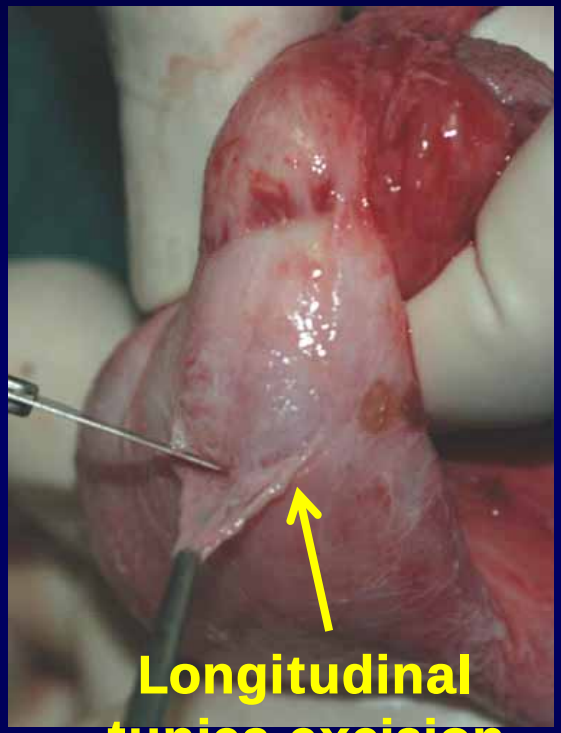
Diverticular skin urethra

Double - "S" curvature (arrows)



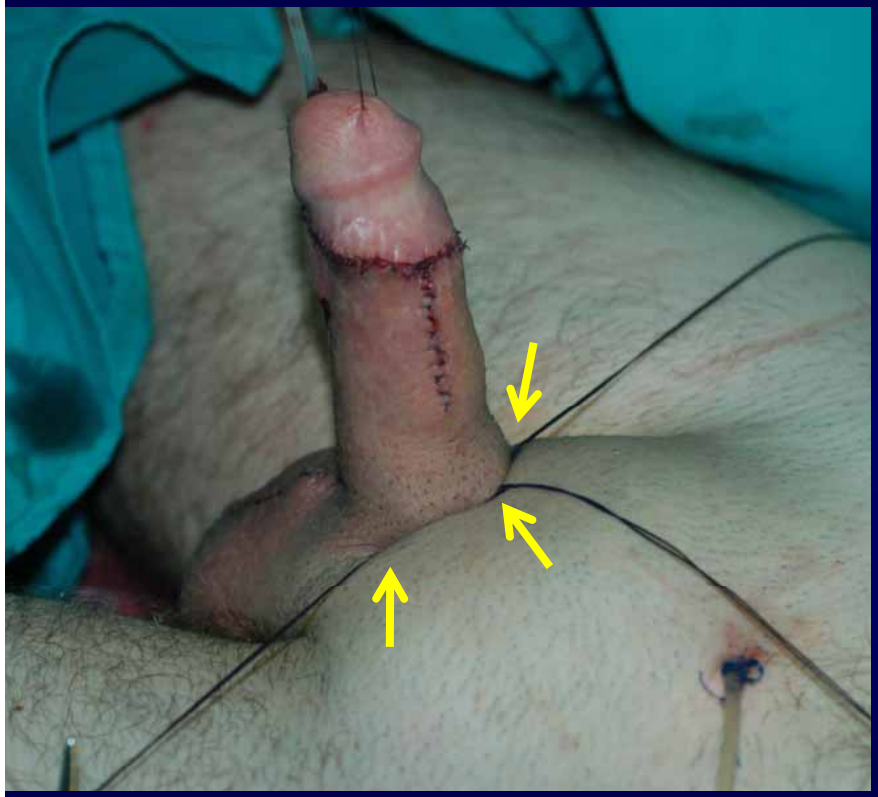
Ellipsoid excision of longitudinal tunical layer and plication at two points (arrows)





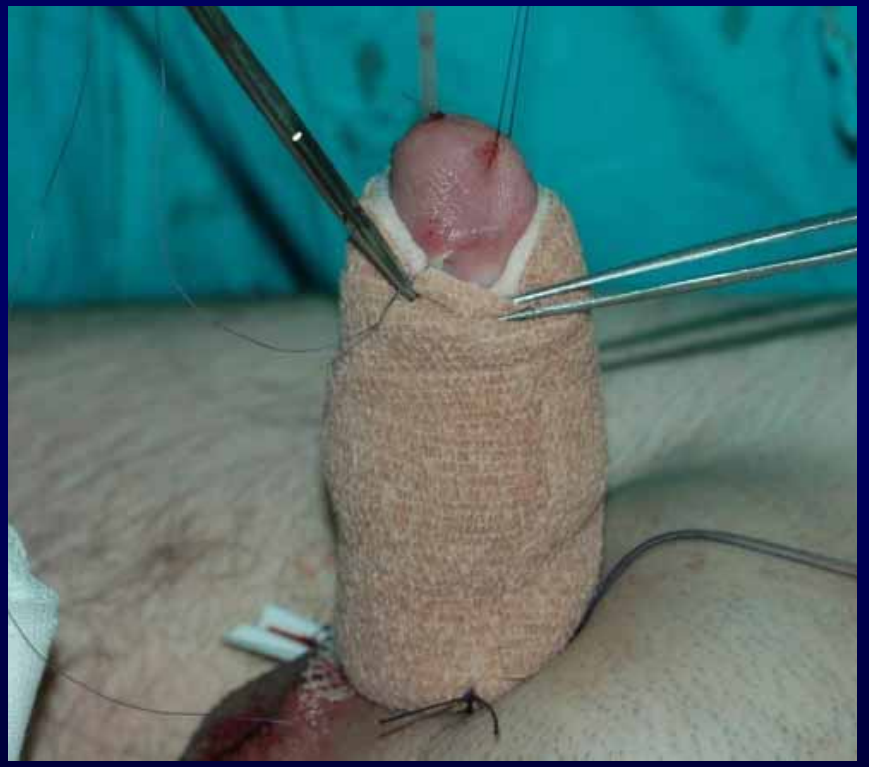
Urethral tailoring by external plication

Reconstruction of penile skin using remaining penile skin and scrotal flaps

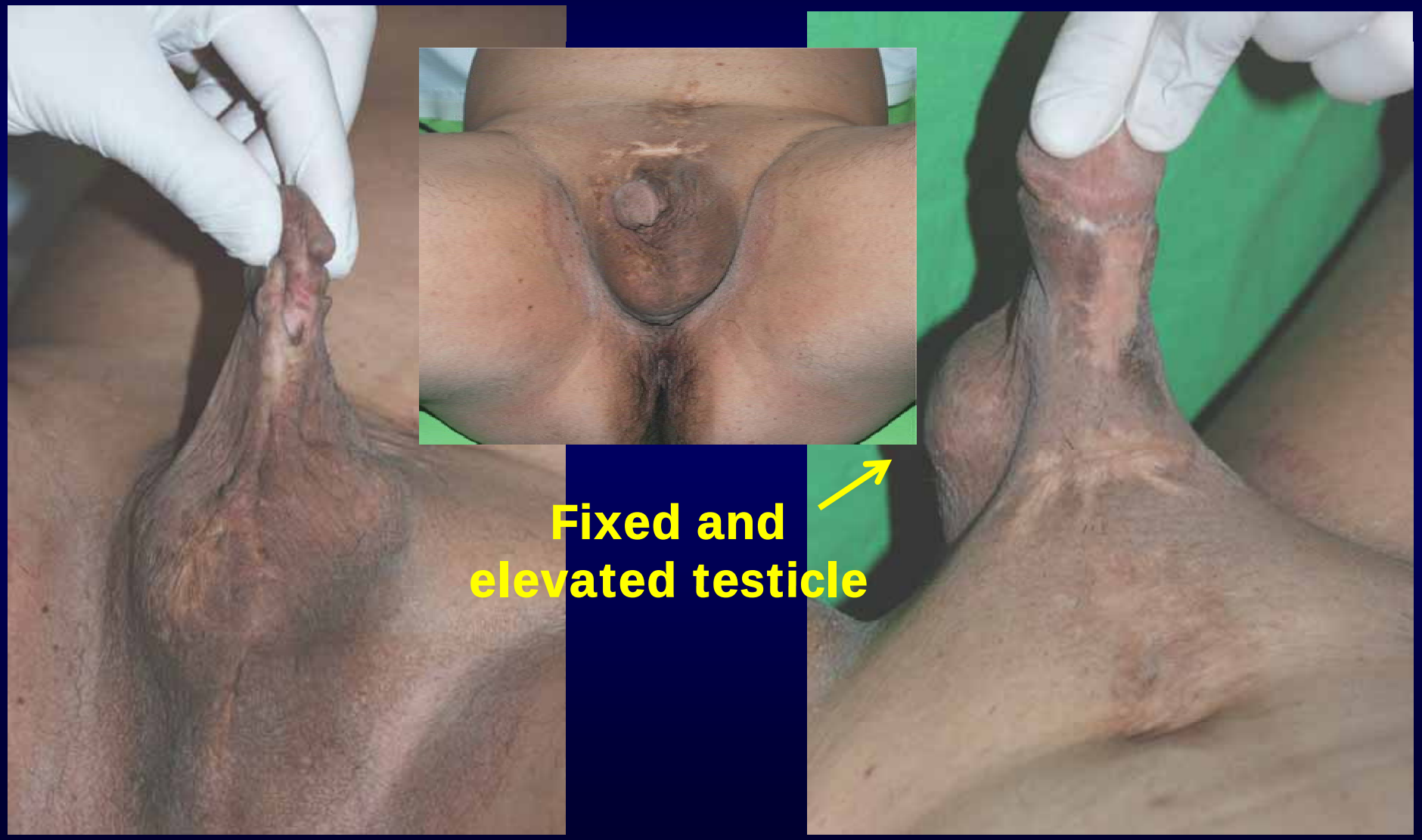


Peno-pubic and peno-scrotal angles are formed by tacking penile base skin to the albuginea (arrows)

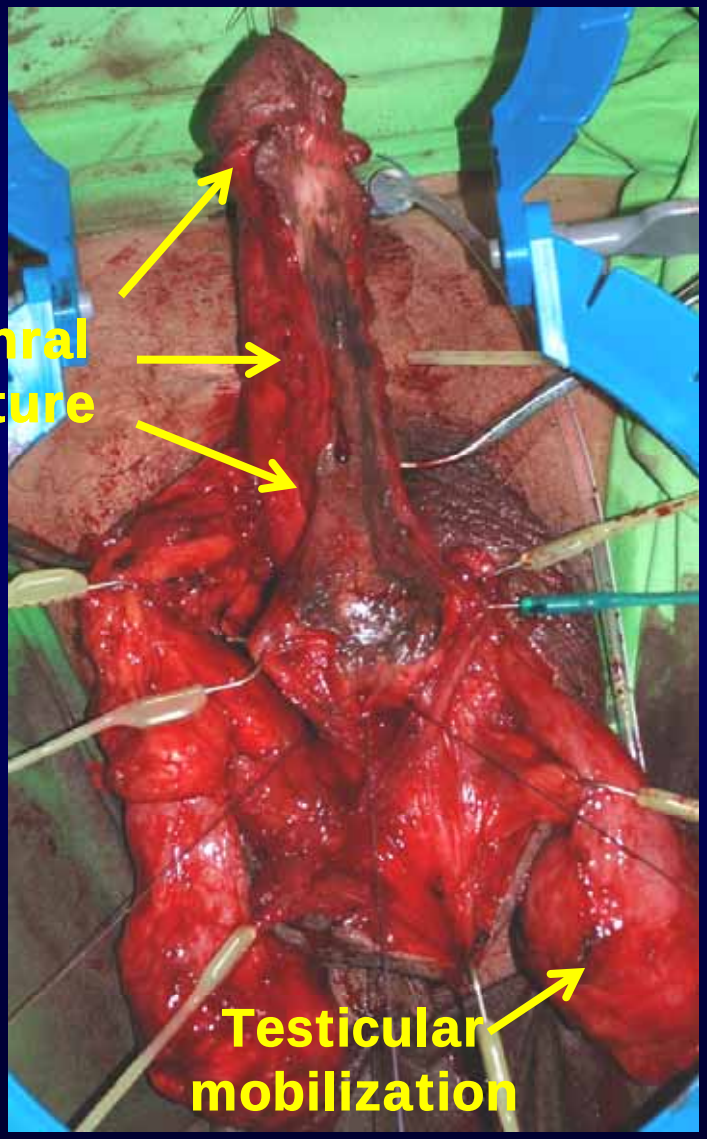
Fixation of loose compressive dressing at the base and at subcoronal level

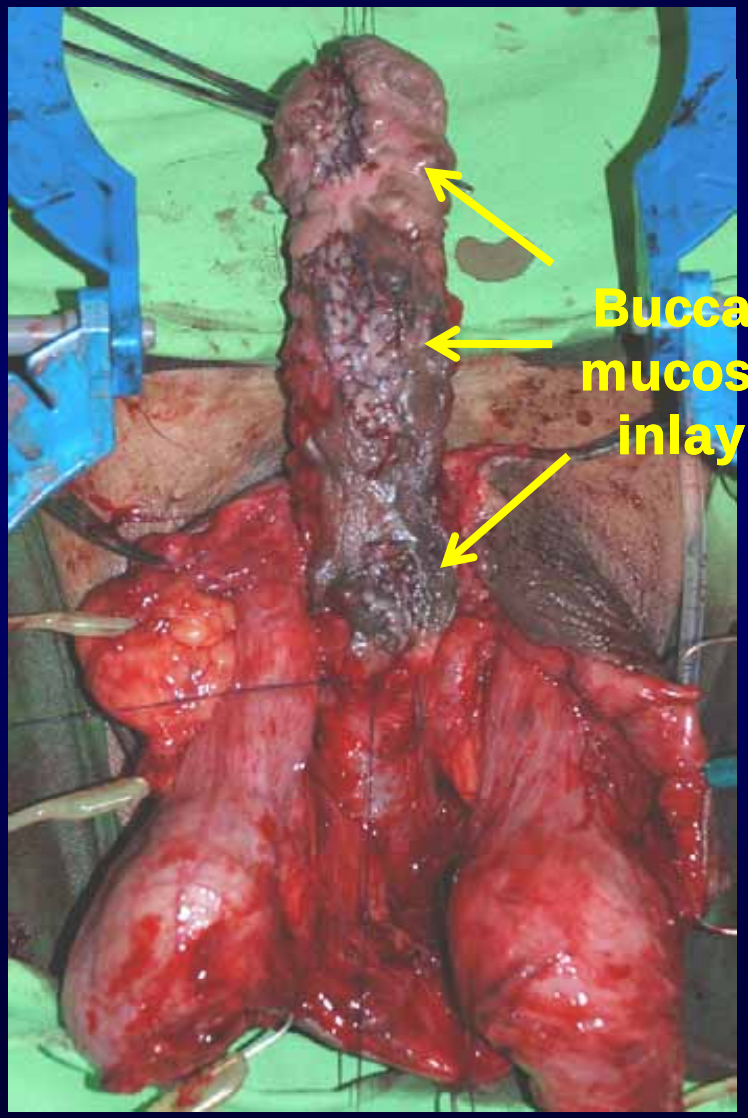


39-year-old patient with 33 previous surgeries - Two stage repair

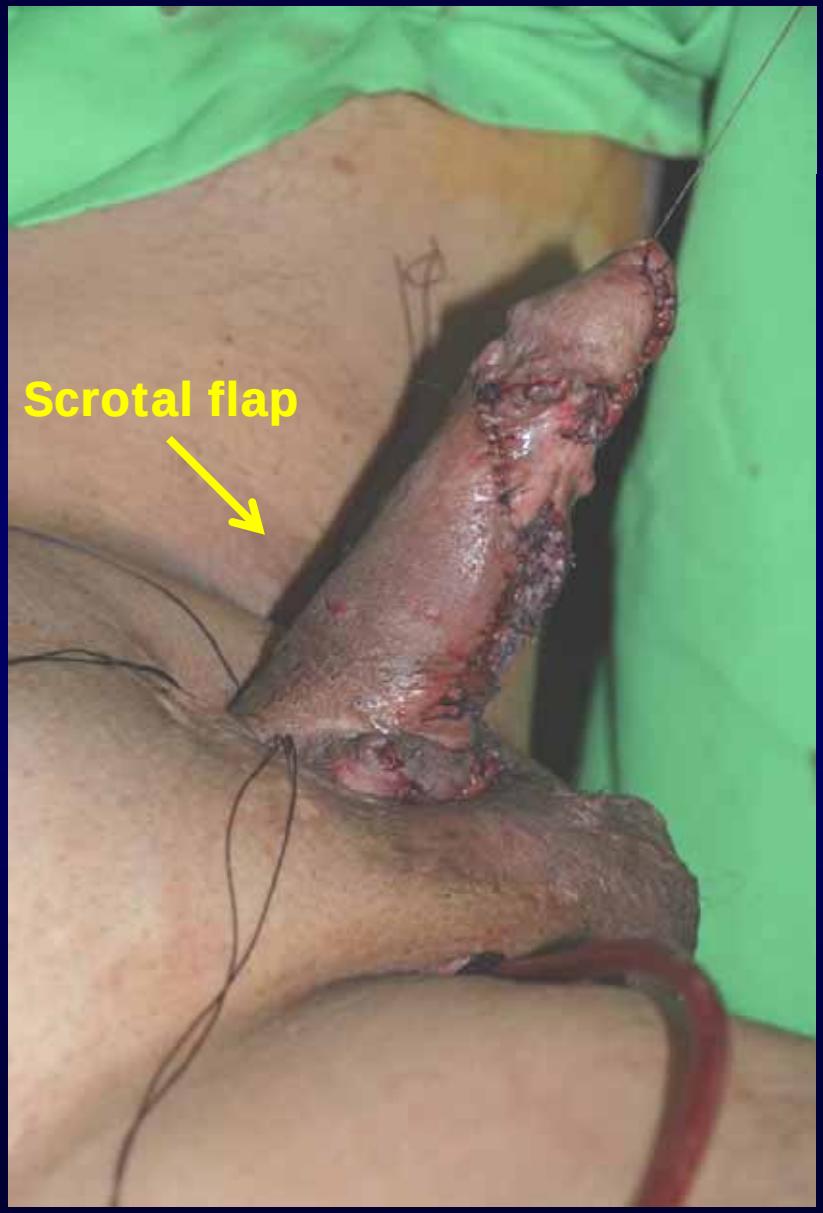


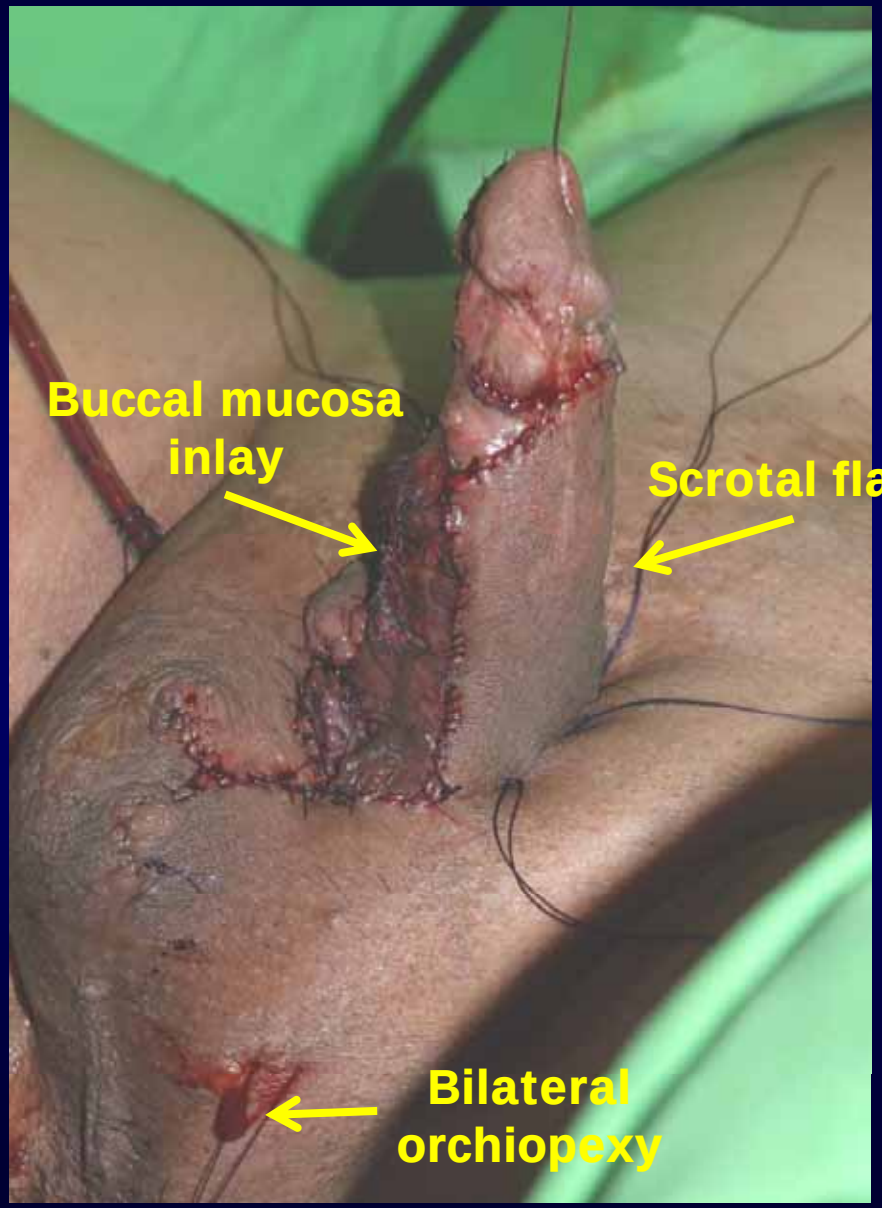
Extensive degloving and partial urethral augmentation with buccal mucosa





Penile skin reconstruction using scrotal flap



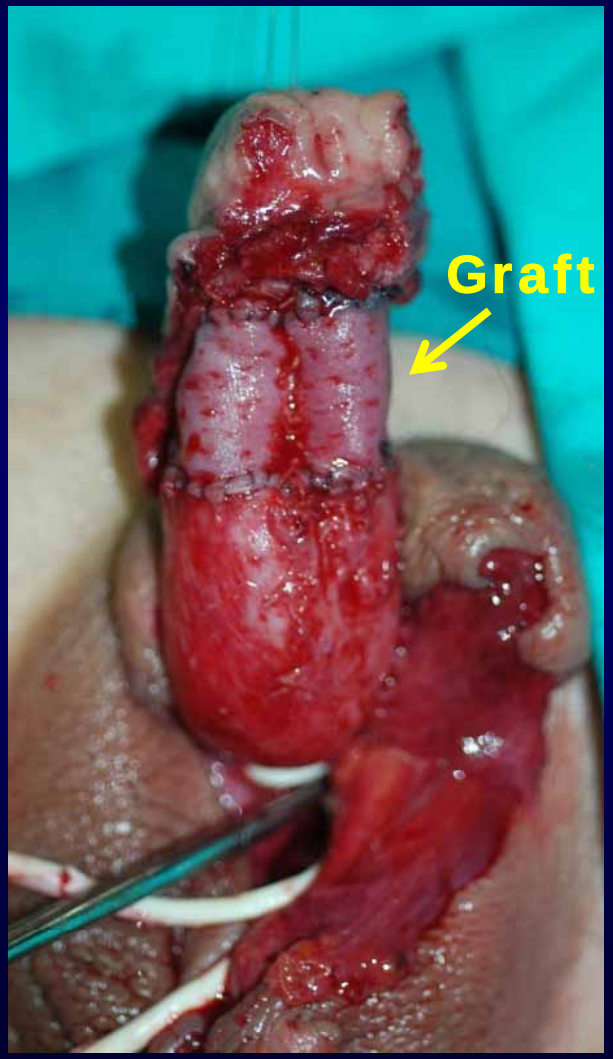


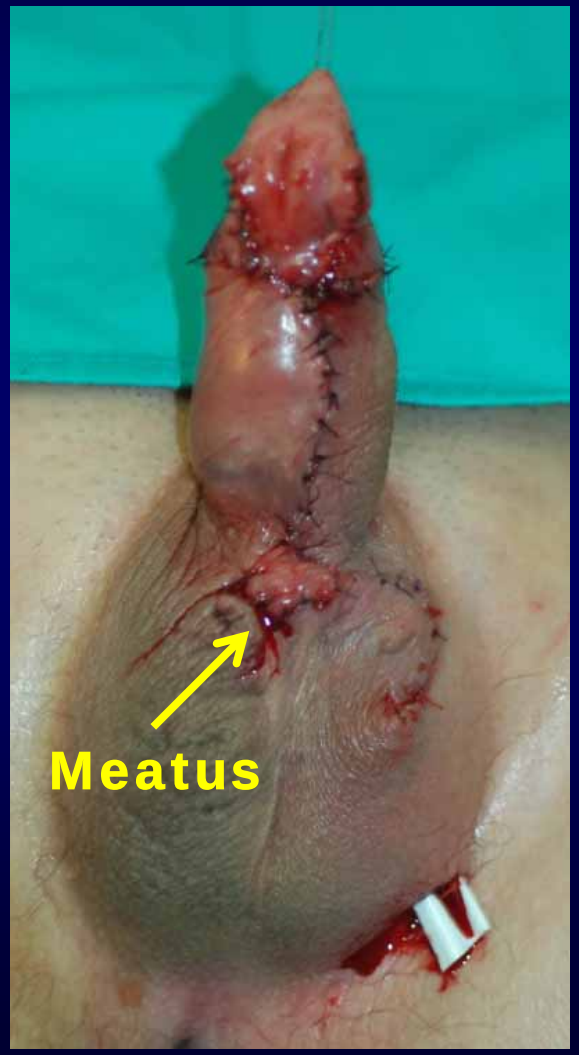
Second stage urethroplasty after 6 months - buccal mucosa tubularisation, glans, penis and scrotum plasty

CRIPPLED PENIS: Severe curvature and short, strictured, fistulous neourethra with small, deformed glans

Severe curvature and short, strictured, fistulous neourethra and small deformed glans

I-stage: Penile lenghtening by ventral grafting (InteXen® 3x7cm)



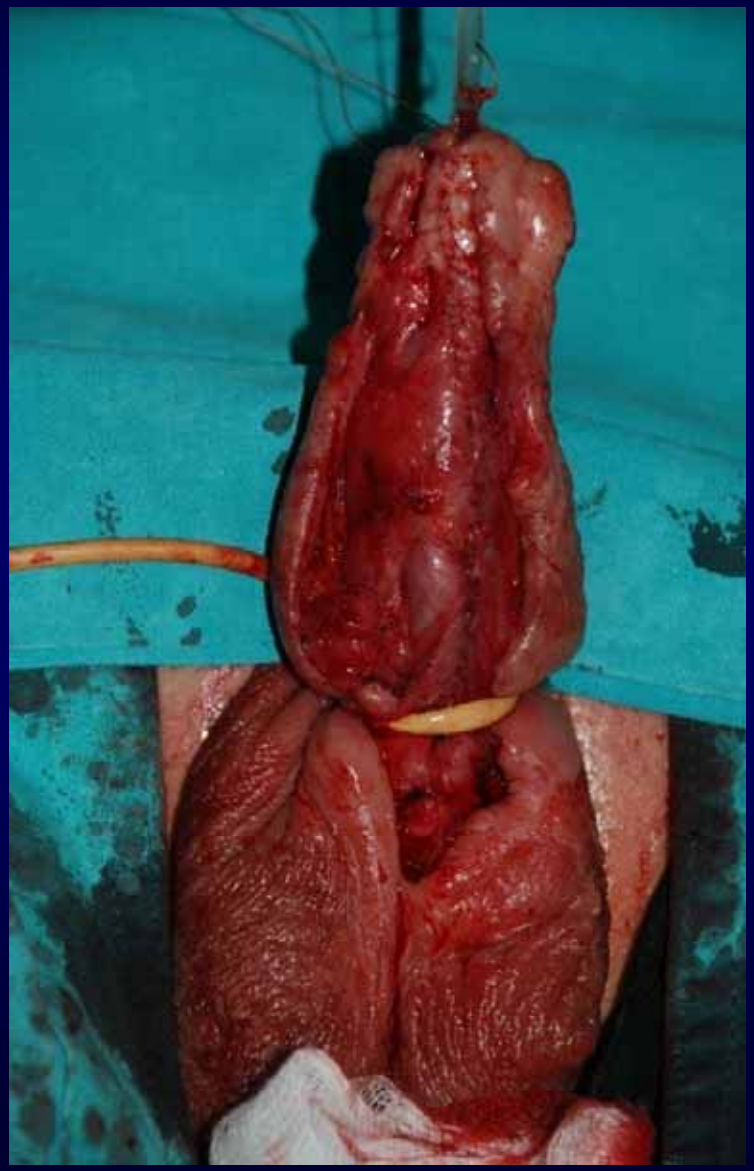


II-stage: Excessive buccal mucosa graft quilting

III-stage: Tubularizing urethroplasty

Completely straightened and lenghtened penis

Glanular and urethral reposition; skin reconstruction



Outcome after 14 months

TAKE-HOME MESSAGE

- Treatment of failed hypospadias is both surgery and an art with creativity and flexibility being key component for successful outcome

- Proper clinical and surgical assessment is crucial for appropriate treatment

- **Urethroplasty is important but not the only goal of repair - equally important is creation of long and straight penis to enable unobstructed voiding and normal sexual life**

- **Reconstruction of penile skin is often the most difficult and major problem for successful treatment**

This is complex surgery, and is best to be undertaken only in an appropriate environment by skilled surgeons fully educated and trained in the technique