

Surgery of hypospadias in 2006 – Techniques & outcomes

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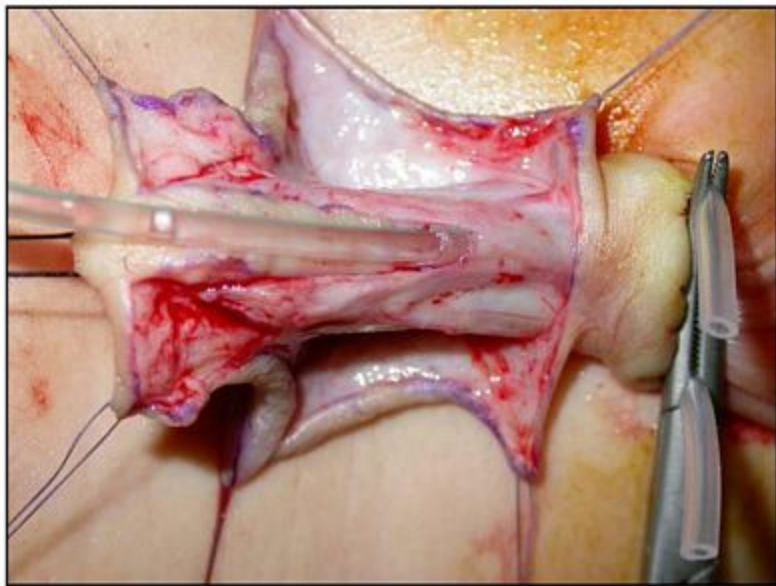




Hypospadias: Principles of treatment

- Correction of chordee
- Urethroplasty
- Reconstruction of the ventral radius of the penis with or without preservation of the foreskin

Dissection of the ventral radius



Step 1: Correction of chordee

Dissection of the urethral plate and dorsal neurovascular bundle



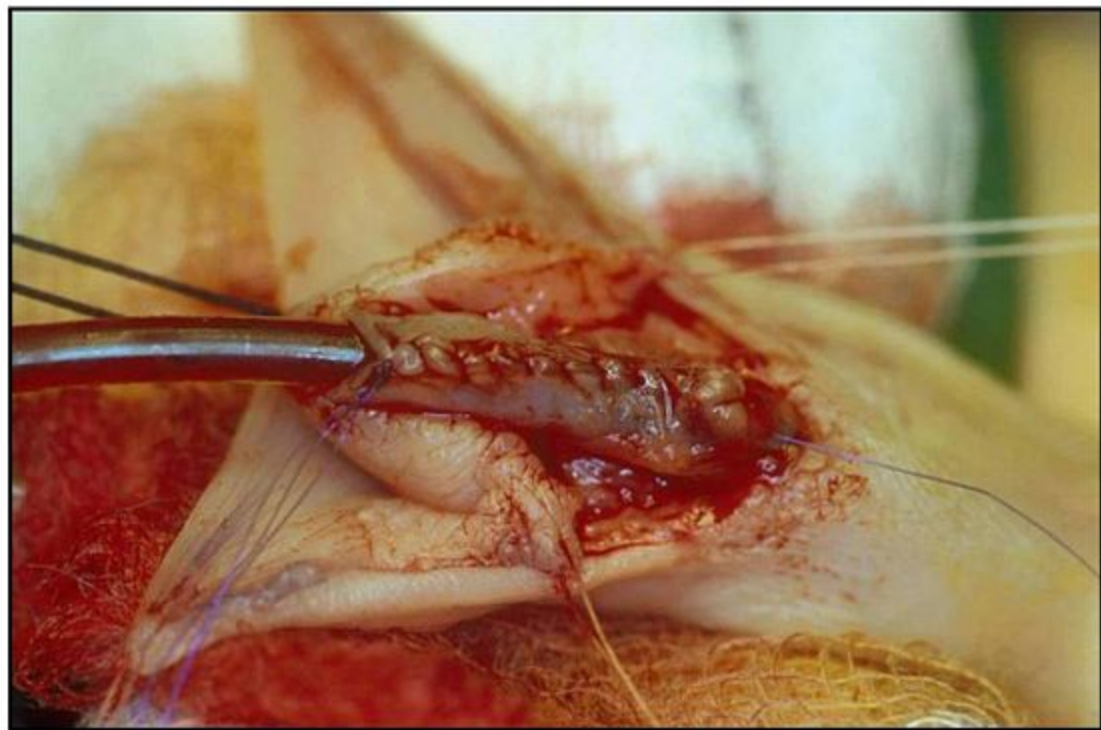
Step 1: Correction of chordee



Step 2: Urethroplasty

- Quality of urethral plate:
 - Wide and healthy: Duplay
 - Not wide enough and healthy:
 - Short urethroplasty
 - Snodgrass
 - Mathieu
 - Koff
 - Long urethroplasty
 - Onlay
 - Buccal
 - Poor
 - Asopa – Duckett tube
 - 2-stage urethroplasty (Cloutier Bracka)
 - Koyanagi

Wide and healthy urethral plate



THIERSCH - DUPLAY



Results Duplay - Snodgrass

- Distal repair: Fistulae: 2%
- Glans dehiscence: 3%
- General review of literature (2035 pts): 9%
 - 5% fistulae
 - 3% metal stenosis
 - 9% dehiscence
 - 2% stricture
- Proximal Snodgrass: 21% fistulae
- Redo Snodgrass: 25% complications
- Snodgraft (buccal inlay graft)

Mathieu procedure



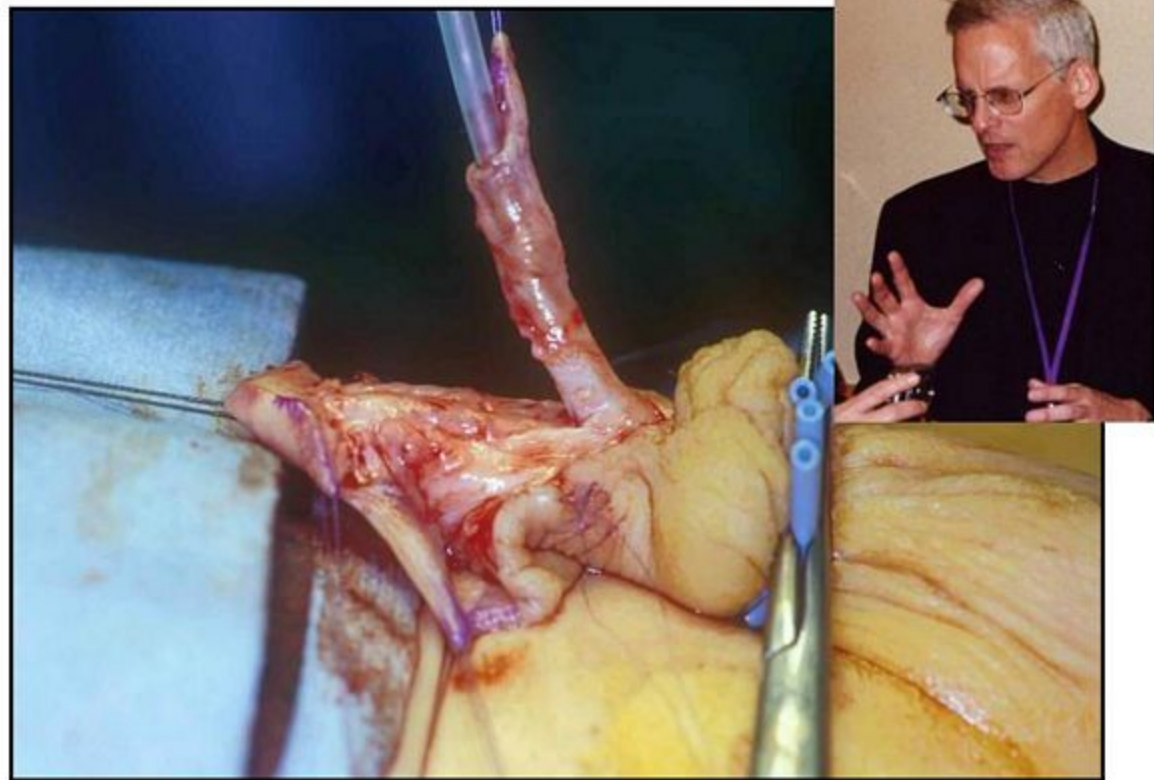
Not wide enough and healthy urethral plate



Mathieu results

- Distal stricture: 1%
- Fistula rate: 5 - 10%
- Half moon urethral meatus
- It is actually almost a free skin graft urethroplasty
- One of the rare procedures with long-term outcome (1932)
- Reoperation rate after Mathieu: Low
Minevich - J Urol 162: 2141-2143, 1999

Short urethroplasty – healthy urethra



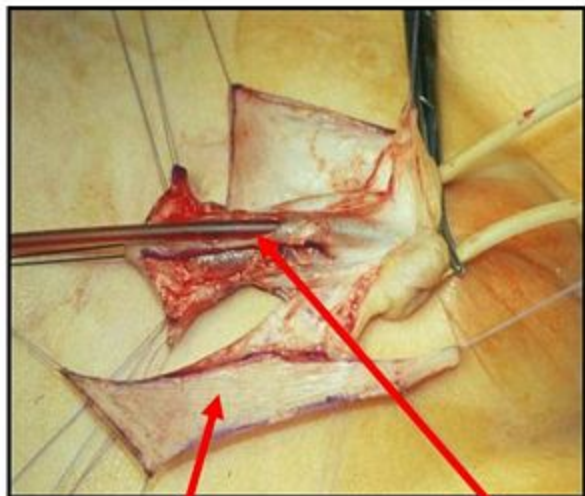
KOFF



Koff results

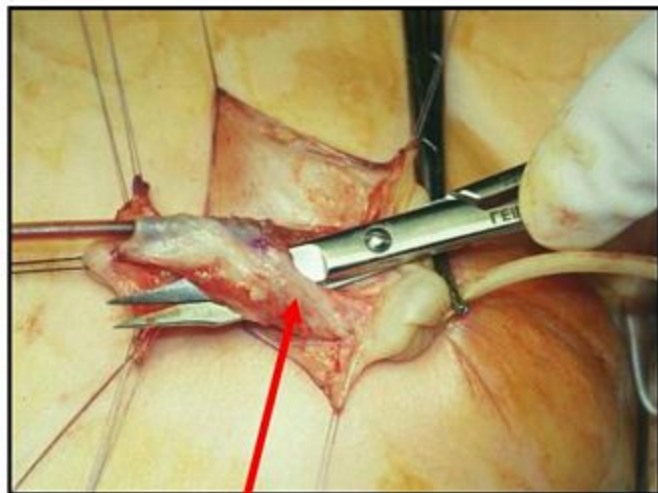
- Short urethral defect (< 2cm)
- No non-urethral tissues
- Very low fistula rate
- Meatal stenosis (distal ischaemia):
19.2%
- Mouriquand P. et al - Progrès en Urologie 11: 1327-1330, 2001

Onlay island flap urethroplasty



Preputial mucosa

Urethral plate



Vascular pedicle

Onlay / Duckett - results

- Elbakry (BJUI 88: 590-595, 2001): 42% complications
 - 5 breakdowns (7%)
 - 17 fistulae (23%)
 - Urethral strictures (9%)
 - Urethral diverticulæ (4%)
- Asopa / Duckett tube
 - 3.7% (El-Kasaby J Urol 136: 643-644, 1986)
 - 69% (Parsons BJU 25: 186-188, 1984)
 - 15% (Duckett - 1986)



Buccal graft urethroplasty



Buccal - Results



- 57% complications (30 patients) after 5 year FU Duckett - J Urol 153: 1660-1663,1995
 - Meatal stenosis (5)
 - Strictures (7)
 - Fistulae (2)
 - Breakdown (1)

Cloutier Bracka



Proximal division of the corpus spongiosum



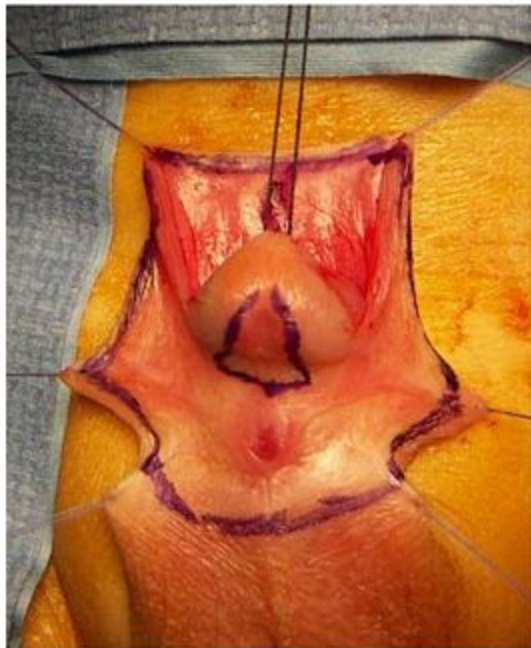
2-stage procedures

- 1st stage: Correction of chordee + grafting of the ventral radius using skin or buccal mucosa
 - 81% complete take
 - 19% focal scar / contracture
- 7% stricture rate
- Bracka A. BJU (Suppl. 3) 31-41, 1995
- Cloutier A. Plast Reconstr Surg 30: 368-373, 1962

Koyanagi

Major hypovirilization
Of the genital tubercle

30 à 50% complications



Hypospadias - Procedures for cripple hypospadias

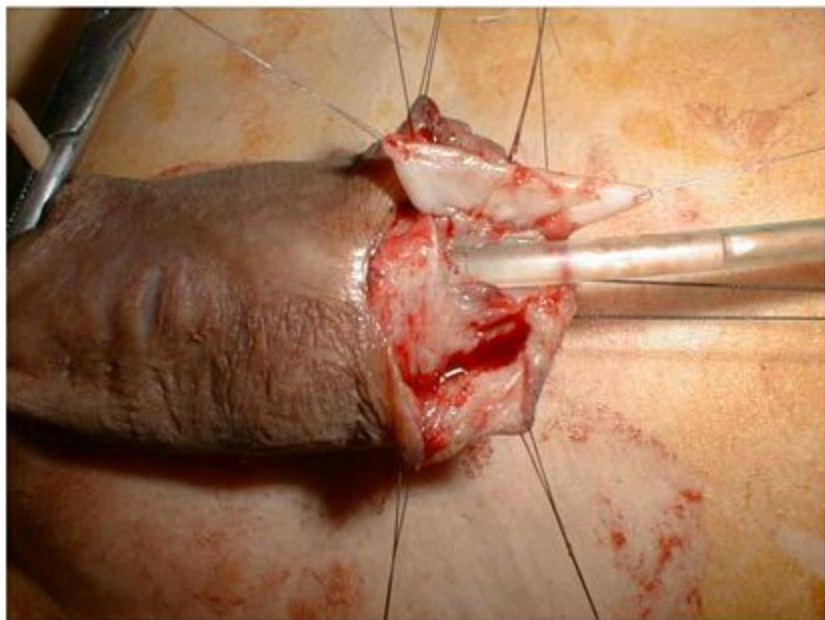
- No standardized procedures
- Personal experience of the surgeon
- Importance of a uro-endocrine approach of complex cases to increase the healing abilities of the penile tissues



Buccal (redo)



Buccal (redo)



Koff Redo

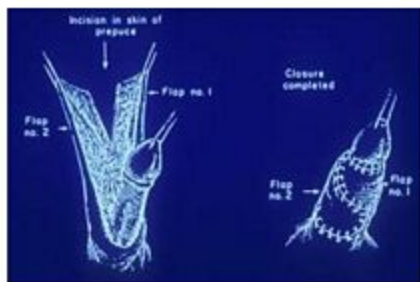
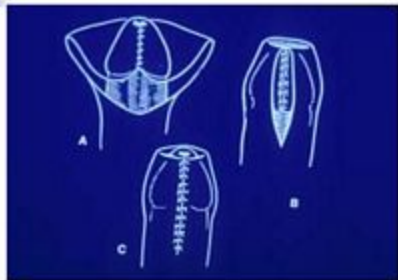




Step 3: Reconstruction of the penile radius

- Spongioplasty
- Meatoplasty
- Glanuloplasty
- Skin cover
- Circumcision or preservation of the foreskin

Skin cover





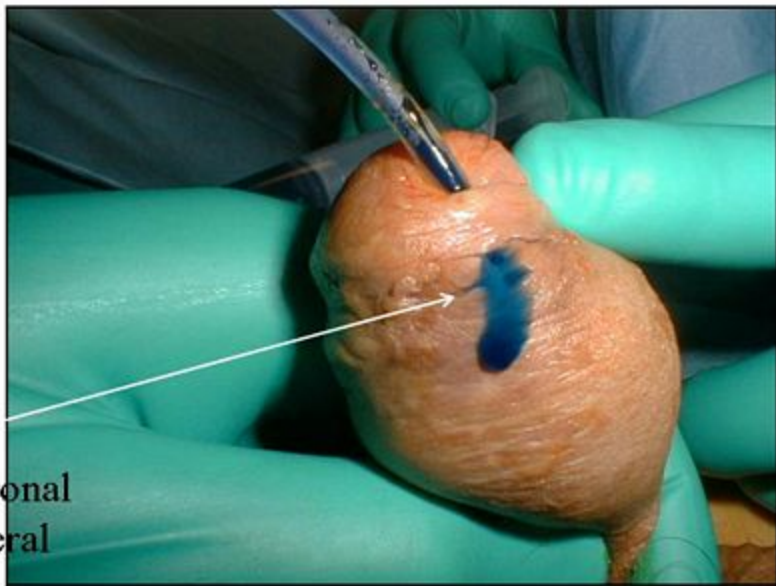
Hypospadias - Complications

- Unsatisfactory cosmetic result: +++
 - Excess of ventral skin
 - Skin blobs
- Fistulæ: 4 to 20 %
 - Blood supply
 - Infection
 - Intrinsic tissular growth factors
 - Technique used
 - Experience of the surgeon



Bad cosmetic result

Fistula



Often coronal
Often lateral

Treatment of isolated fistulæ

- Rectangular skin incision around the fistula orifice, often lateral
- Dissection and excision of the fistula tract
- Urethral suture
- Multilayer cover with well-vascularized tissue (tunica vaginalis, dartos, dorsal subcutaneous flap ...)
- Problem: coronal fistula +++: Prefer redo urethroplasty
- Suprapubic diversion ?
Elbakry



Hypospadias - Complications

- Urethral stenosis: 1 to 10%
 - Less frequent since the onlay procedure (= no circular anastomosis)
 - Less frequent since we avoid skin urethroplasties
 - Urethral dilatation badly accepted by children
 - Redo-urethroplasty often necessary especially for proximal stenosis
 - Meatal stenosis quite common with the Koff procedure (? distal ischaemia)
- Diagnosis: not easy - Urine flow almost always abnormal after urethroplasty. Importance to see the child peeing

Urethral stenosis + urethrocele





Treatment of urethrocele

- Excision of redundant tissue: Is that enough ?
- Often associated with distal obstruction or FUNCTIONAL obstruction due to a DIFFERENCE of COMPLIANCE between the native urethra and the reconstructed urethra
- Mucosa better than skin



Hypospadias - Complications

- Fistula + stenosis: +++
- Urethral dehiscence
- Persistent chordee
- Urethrocele (bladder mucosa)
- Urethral prolapse
- Urethral stones (hairy scrotal skin)
- Balanitis xerotica obliterans
- Disasters



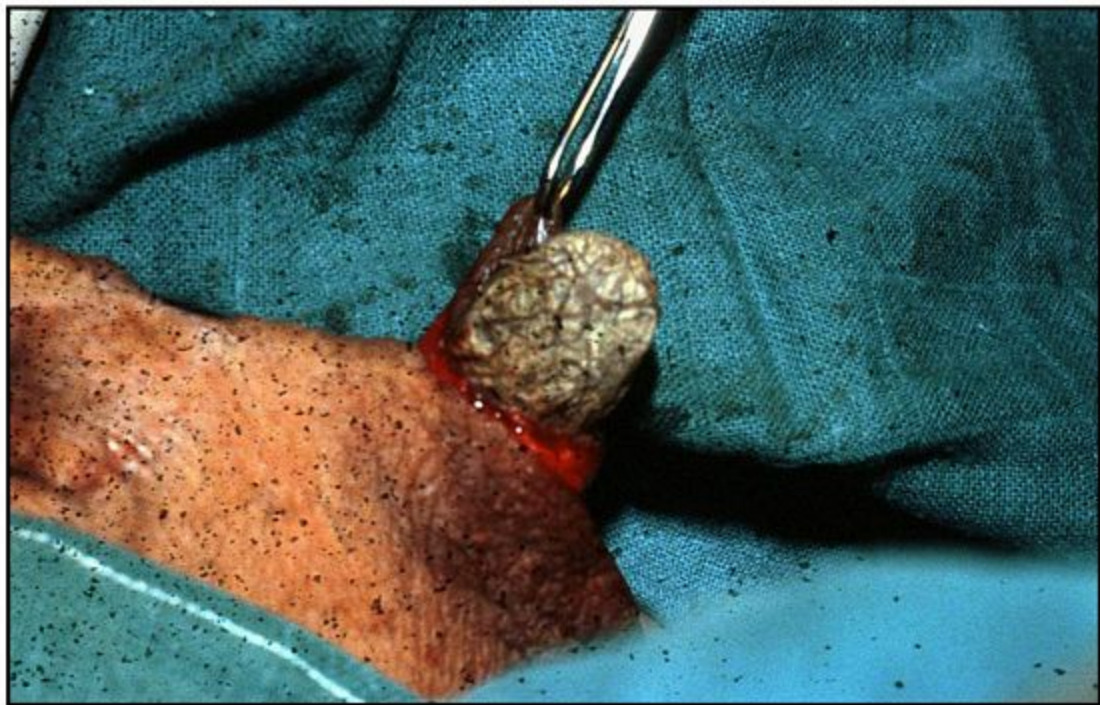
Glans scab



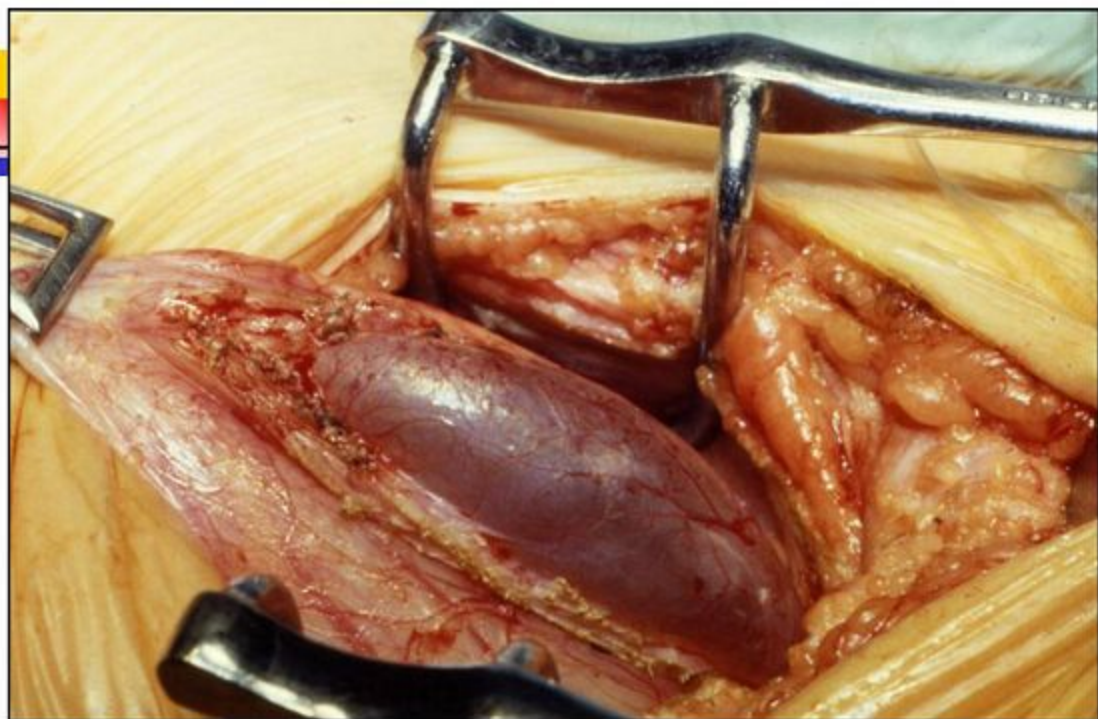
infection



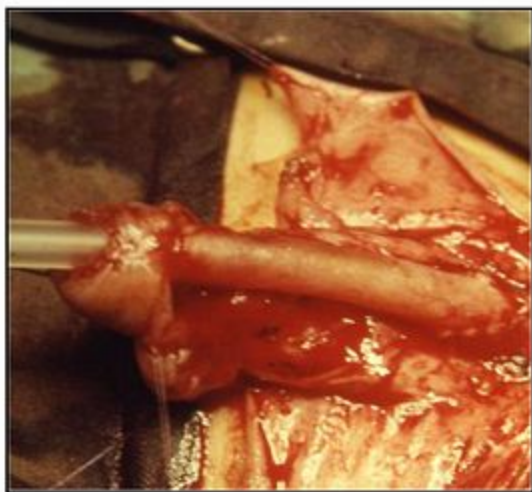
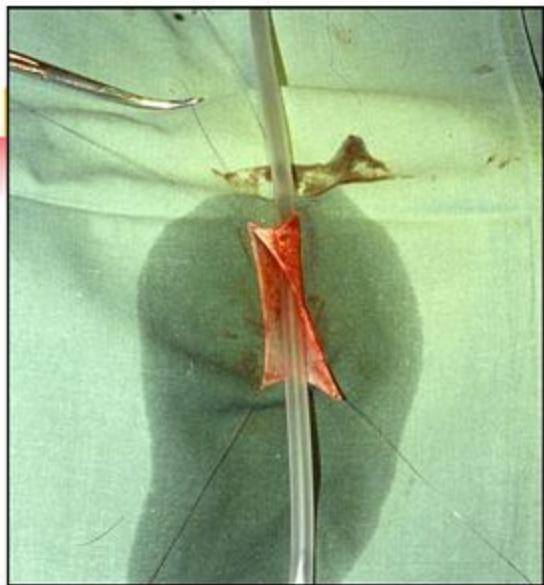
infection



Urethral stone



Bladder graft mucosa



Bladder graft mucosa



Hypospadias - Age and preparation for surgery

- Mostly 15-18 months
- Possible earlier
- Between 2 and 4 years should be avoided for psychological reasons
- Pre-op endocrine treatment:
 - Testosterone: $100 \text{ mg} / \text{m}^2$
 - DHT cream
 - GH ?
- Redo: Not before 6 months after 1st op.

Age for surgery

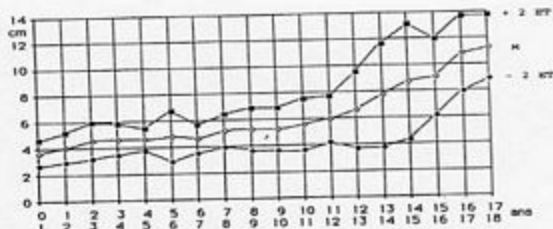


Fig 1. Courbes d'évolution de la longueur de la verge en fonction de l'âge. M: valeurs moyennes; ET: écart type; en abscisse, âge des enfants et adolescents: 0 à 1 an, 1 à 2 ans... 17 à 18 ans.

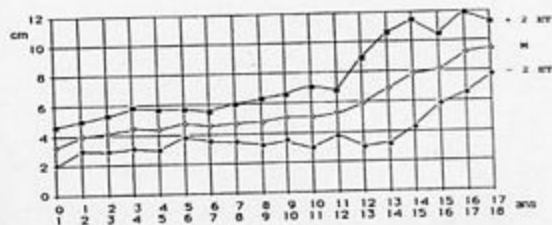


Fig 2. Courbes d'évolution de la circonférence de la verge en fonction de l'âge. M: valeurs moyennes; ET: écart type; en abscisse, âge des enfants et adolescents: 0 à 1 an, 1 à 2 ans... 17 à 18 ans.



Hypospadias - Sexuality

- Mureau M.A. et al. J Urol 154: 1351, 1995
- Mureau M.A. et al. J Urol 154: 1902, 1995

- ? Delayed sexuality



Hypospadias - Conclusions

- Hypospadias surgery remains a surgical challenge
- Long-term results are poorly reported
- Essential joint uro-endocrine approach
- Psychological consequences poorly assessed
- Informing parents is crucial: 50% of all hypospadias will require further surgical attention during their life.
- Research: Essential role of the placenta / Penile growth factors / healing factors / blood supply ...