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 chorddee
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
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 ischæmia): 19.2%

Onlay island flap urethroplasty

- Urethral plate
- Preputial mucosa
- Vascular pedicle
Onlay / Duckett - results

- Elbakry (BJU 88: 590-595, 2001): 42% complications
  - 5 breakdowns (7%)
  - 17 fistulæ (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 - \textit{J Urol} 153: 1660-1663, 1995
  - Meatal stenosis (5)
  - Strictures (7)
  - Fistulae (2)
  - Breakdown (1)
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
Koyanagi

Major hypovirilization
Of the genital tubercle

30 to 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)
Step 3: Reconstruction of the penile radius

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

- 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
Urethral stone
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 mg / m²
  - 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

- ? 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 ...