Management of Penile Curvature (Chordee) at CHOP

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Hypospadiology:
Noun. hy–po-spayd’-ee-ah-low-gee

1. The study of boys with hypospadias and the outcomes we witness.

2. A difficult science that is humbling and energy consuming

Constellation of hypospadias:

- Ectopic urethral meatus
- Dorsal hooded foreskin
- Ventral penile curvature
Constellation of hypospadias:

• Ectopic urethral meatus
• Dorsal hooded foreskin
• Ventral penile curvature
The key to a satisfactory (and lifelong) repair

1. Correct curvature
2. Ensure that there is good growth potential for long term outcome → through adulthood
   a. Supple ventral shaft skin
   b. A urethral plate that is not going to tether the penis
   c. Correct any corporal body disproportion
3. There is significant morbidity associated with poorly corrected curvature as boys age
Correcting ventral penile curvature: How?

1. Penile shortening procedure → Dorsal plication

2. Penile lengthening procedure → Corporal lengthening
Correcting ventral penile curvature: How?

Dorsal plication
  – Nesbit plication\(^3\)

  – Baskin plication\(^4\)

  – Zaontz modification of the Nesbit plication\(^5\)

\(^3\)Nesbit RM, 1965
\(^4\)Baskin LS et al, 1998
\(^5\)Dean GE et al, 2000
Dorsal plication: Baskin Technique (midline plication)

- Midline incision through the tunica
- Absorbable vs non-absorbable suture
- Dartos is closed over permanent sutures
- Curvature is re-assessed to confirm correction
Correcting ventral penile curvature: How?

Corporal lengthening

- Autologous tissue\textsuperscript{6}
  - Dermal graft
  - Tunica vaginalis flap
  - Tunica vaginalis graft
- Non-autologous tissue
  - Small intestinal submucosa (SIS) graft
    - Single-ply vs 4-ply\textsuperscript{7}
- Multiple ventral corporal incisions ("Fairy cuts")\textsuperscript{8}

\textsuperscript{6}Braga LH et al, 2007
\textsuperscript{7}Weiser AC et al, 2003
\textsuperscript{8}Devine CJ, 1983
Correcting penile curvature: Dorsal plication vs lengthening procedure

Limited data on a direct comparison of the two approaches

• Higher risk of recurrent curvature when plication is used in the absence of urethral plate division\textsuperscript{6}

• Decreased complication rates when 2-stage repair used vs single stage repair (plication)\textsuperscript{9}

\textsuperscript{6}Braga LH et al, 2007

\textsuperscript{9}Pippi Salle JL et al, 2016
### Correcting ventral penile curvature: Corporal lengthening vs Plication

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<tr>
<th>Repair</th>
<th>Pros</th>
<th>Cons</th>
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<tr>
<td>Dorsal plication</td>
<td>- Quicker procedure</td>
<td>- Risk for recurrence of curvature if incorrectly utilized</td>
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<td>- Single stage repair</td>
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<td>- Minimal/non risk for ED</td>
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<td>Penile lengthening</td>
<td>- More effective for severe curvature</td>
<td>- ? Risk for erectile dysfunction</td>
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<td>- Results in longer penis</td>
<td>- Longer procedure</td>
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<td>- Commits the patients to a 2-stage procedure</td>
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Concern for proximal hypospadias

- Penis is degloved, chordee tissue is resected

**No residual curvature**
- Urethroplasty

**Mild curvature, <30°**
- Division of urethral plate
- Dorsal plication
- Single stage repair
- Consider corporal lengthening procedure

**Moderate-severe curvature, ≥30°**
- Division of urethral plate
- Dorsal plication
- Single stage repair
- Corporal lengthening, 2-stage repair
Determining the degree of curvature

- Curvature is assessed after complete degloving
- Artificial erection is performed with a penile tourniquet
- Goniometer to obtain an objective measurement
Persistent ventral curvature >30 after urethral plate division
Corporoplasty with dermal graft

- Tunica albuginea incised horizontally on the ventrum of the penis, opposite the point of maximal curvature
- Incision should be carried laterally so the penis is “unhinged”
- Care must be taken to avoid injury to the neurovascular bundle
- Defect is measured so an appropriately sized graft can be harvested (either dermal or tunica vaginalis)
Corporoplasty with dermal graft

• Excess graft is excised then secured in place with a running, water tight anastomosis
• Groin incision is closed with minimal scar
Corporoplasty with dermal graft

Repeat artificial erection is performed to confirm that curvature has been completely corrected.
Correcting penile curvature: Concerns

• Potential long-term efficacy (adulthood) of penile straightening procedures
  – Recurrent curvature
  – Erectile dysfunction

• What degree of curvature should be the dividing line for pursuing plication vs a lengthening procedure?
  – 20°, 30°, 45°, 60°?

• Which technique is best for penile lengthening?

• Should chordee even be corrected, i.e. at what point is it worthwhile to fix penile curvature?
THANK YOU