Incision/excision & grafting is the optimal surgical technique for severe penile curvatures

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Disclosures

Consultant/Advisory Board Member

- Allergan
- Anteres
- Auxilium
- American Medical Systems
- Coloplast
- Endo
- Lilly
- Neri / Ixchelsis
- NIH
- Therologix
- Absorbent
- Abbott/Abvie
Peyronie’s disease

• A fibrotic wound-healing disorder of the tunica albuginea of the penis
• Characterized by penile curvature, palpable penile plaques, hourglass defect, penile hinging/instability, and penile shortening
• 2 phases of disease: acute and chronic
• Oral medications, topical agents, intralesional injections, mechanical stretching or vacuum devices, and ESWL are available options
• Surgery remains the gold standard
Surgical Approaches for PD

• Tunical shortening
  – Nesbit plication
  – Modified penile plication

• Tunical lengthening
  – Incision and grafting
  – Excision and grafting

• Penile prosthesis

• Autologous grafts
  – Dermis

• Vein grafts
  – Tunica albuginea
  – Tunica vaginalis
  – Temporalis fascia
  – Buccal mucosa

• Allografts
  – Cadaveric pericardium
  – Cadaveric fascia lata
  – Cadaveric dura mater
  – Cadaveric dermis

• Xenografts
  – Porcine small intestine submucosa
  – Bovine pericardium
  – Porcine dermis

• Synthetic grafts
  – Gore-Tex
  – Dacron

Hatzimouratidis K et al; Eur Urol 2012;62:543-52
Surgical Approaches for PD

1. Tunical Shortening – Reconstructive procedure on convex side (opposite to the plaque)

2. Penile Lengthening – Reconstructive procedure on concave side (same side as plaque) - incision & grafting

3. Penile Prosthesis - (manual modeling, multiple tunical incisions, incision/excision ± grafting)
Goals of surgery

- Straighten the penis
- Preserve penile length and girth
- Preserve erectile function
- Achieve overall patient satisfaction

- Set realistic expectations
- Thorough pre-op assessment is crucial
- Choose the right procedure
Preoperative Assessment (PD)

- Assessment of penile vascular (erectile) status allows for optimal surgical approach

- Penile duplex Doppler U/S: assesses structure of corpus cavernosum, tunica albuginea (plaque) & penile vascular function (collateral communications)
Plication

**Advantages**
- Simple procedure
- Minimally invasive
- Tends to preserve potency

**Disadvantages**
- Penile shortening
- May worsen an existing hour-glass or hinge effect, particularly if large plications are used

Ralph D et al; J Sex Med 2010;7:2359-74
Grafting

**Advantages**

- Less penile shortening
- Can repair hourglass deformity and greater penile curvatures

**Disadvantages**

- More complicated surgery
- More post-op ED (less with partial excision/incision)
- Decreased sensation
- Possible graft morbidity

Ralph D et al; J Sex Med 2010;7:2359-74
Case

- Previously sexually active 58 year old male with chronic Peyronie’s disease and a $90^\circ$ upward curve
- Mild ED responsive to medical therapy
## Prospective analysis of 103 PD men

<table>
<thead>
<tr>
<th>Surgical Procedure</th>
<th>No.</th>
<th>Age Mean (range)</th>
<th>Degrees Preop. Curvature Mean (range)</th>
<th>Mos. Followup Mean (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tunica albuginea plication</td>
<td>22</td>
<td>40 (21–68)</td>
<td>39 (30–90)</td>
<td>19.5 (3–39)</td>
</tr>
<tr>
<td>Incision or partial excision and dermal grafting</td>
<td>48</td>
<td>47 (16–67)</td>
<td>Dorsal 62, lateral 61, ventral 90</td>
<td>19.6 (3–48)</td>
</tr>
<tr>
<td>Tunica vaginalis grafting</td>
<td>4</td>
<td>41 (29–52)</td>
<td>55 (30–90)</td>
<td>33.0 (30–37)</td>
</tr>
<tr>
<td>Prosthesis placement</td>
<td>29</td>
<td>54 (40–75)</td>
<td>55 (0–90)</td>
<td>22.3 (3–45)</td>
</tr>
</tbody>
</table>

Levine LA and Lenting EL; J Urol 1997;158(1):2149-52
Post-operative results following tunica albuginea plication (n=22)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full erectile capacity</td>
<td>20 (91)</td>
</tr>
<tr>
<td>Complete straightening</td>
<td>20 (91)</td>
</tr>
<tr>
<td>Persistent curvature</td>
<td>2 (9)</td>
</tr>
<tr>
<td>Penile shortening</td>
<td>2 (9)</td>
</tr>
<tr>
<td>Decreased sensation</td>
<td>1 (4.5)</td>
</tr>
<tr>
<td>Erectile insufficiency</td>
<td>2 (9)</td>
</tr>
</tbody>
</table>

Curvature $\geq 90\%$

Levine LA and Lenting EL; J Urol 1997;158(1):2149-52
On linear regression analysis, increased curvature (by duplex and intraop erection testing) was a significant predictor of loss of penile length post-op.

Greenfield JM et al; J Urol 2006;175(1):238-41
Location of curvature and shortening

Mean length loss (%)

<table>
<thead>
<tr>
<th>Location of curvature</th>
<th>Mean length loss (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dorsal</td>
<td>0.5</td>
</tr>
<tr>
<td>Lateral</td>
<td>1</td>
</tr>
<tr>
<td>D-L</td>
<td>1.1</td>
</tr>
<tr>
<td>V-L</td>
<td>4.3</td>
</tr>
<tr>
<td>Ventral</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Greenfield JM et al; J Urol 2006;175(1):238-41
TAP vs PEG +/- Traction


<table>
<thead>
<tr>
<th>SPL (cm)</th>
<th>TAP TT+</th>
<th>TAP TT-</th>
<th>PEG TT+</th>
<th>PEG TT-</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,85</td>
<td>0,24</td>
<td>1,48</td>
<td>0,53</td>
<td>-0,53</td>
</tr>
</tbody>
</table>

Erectile Dysfunction (n=218)

<table>
<thead>
<tr>
<th></th>
<th>Tunica albuginea plication</th>
<th>Plaque excision with grafting</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases</td>
<td>103</td>
<td>115</td>
<td></td>
</tr>
<tr>
<td>Average preoperative curvature (degrees)</td>
<td>49</td>
<td>75</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Presence of hinge effect on duplex ultrasound (%)</td>
<td>30</td>
<td>54</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Preoperative erectile function (out of 10)</td>
<td>8.8</td>
<td>8.7</td>
<td>0.47</td>
</tr>
<tr>
<td>Follow-up (months)</td>
<td>84</td>
<td>91</td>
<td>0.06</td>
</tr>
</tbody>
</table>

No difference in rates of ED among patients who underwent tunica albuginea plication or plaque excision with grafting

Taylor FL et al; J Sex Med 2012;9(1):296-301
Size of defect during PEG and ED

<table>
<thead>
<tr>
<th>Tunical defect</th>
<th>Necessity for PDE-5 Inhibitors</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>Total</td>
</tr>
<tr>
<td>≥3cm</td>
<td>5 (41.7)</td>
<td>7 (58.3)</td>
<td>12</td>
</tr>
<tr>
<td>&lt;3cm</td>
<td>20 (77)</td>
<td>6 (23)</td>
<td>26</td>
</tr>
</tbody>
</table>

P=0.033

Additional procedures on the opposite side of the lesion might be required in these instances

Kozacioglu Z et al; J Urol 2012;80:1051-55
### Comparative outcomes

<table>
<thead>
<tr>
<th></th>
<th>Tunical shortening procedures</th>
<th>Tunical lengthening procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nesbit</td>
<td>Plication</td>
</tr>
<tr>
<td>Penile shortening (%)</td>
<td>4.7-30.8</td>
<td>41-90</td>
</tr>
<tr>
<td>Penile straightening (%)</td>
<td>79-100</td>
<td>58-100</td>
</tr>
<tr>
<td>Persistent or recurrent curvature (%)</td>
<td>4-26.9</td>
<td>7.7-10.6</td>
</tr>
<tr>
<td>Postoperative erectile dysfunction (%)</td>
<td>0-13</td>
<td>0-22.9</td>
</tr>
<tr>
<td>Penile hypoesthesia (%)</td>
<td>2-21</td>
<td>0-21.4</td>
</tr>
</tbody>
</table>

Hatzimouratidis K et al; Eur Urol 2012;62:543-52
Graft morbidity

- Historically, total excision of the plaque & grafting resulted in unacceptably high rates of ED, contractures & infections
- Incision and grafting studies report 77% partner satisfaction and 79%-100% rigidity adequate for coitus
- Pericardial grafts contract minimally and have virtually no reported infections or rejections
- SIS grafts with approximately 5% infection rate
- Future: stem cell therapy/tissue engineering

Egydio P et al; Urology 2002;59:570-4
Taylor F and Levine LA; J Sex Med 2008;5:2221-8
Kovac JR and Brock JM; J Sex Med 2007;4:1500-8
Breyer BN et al; J Urol 2007;177:589-91
Gokce A et al; Andrology 2014;2:244-51
94.2% retain full erectile capacity, and 92.2% achieve complete straightening.
Take home message: I & G better option for severe PD curvatures
Thanks
Goals of surgery

- Preserve erectile function
- Straighten penis
- Preserve penile length and girth
- Achieve overall patient satisfaction
- Set realistic expectations
- Thorough pre-op assessment is crucial
- Choose the right procedure
Case report

- 58 y/o man
- Mild arterial hypertension
- 5-10 cig./day
- Slightly overweight, BMI: 28
- Good erections. IIEF: 25
- No stable relationship
- Unable to penetrate
94.2% retain full erectile capacity, and 92.2% achieve complete straightening.
90° penile curvature: patch or corporoplasty?

Speakers: Prof. Wayne Hellstrom (patch)
Prof. Arthur Burnett (corporoplasty)

XVI ISSM World Meeting. Sao Paulo.
Case report

- 58 y/o man
- Mild arterial hypertension
- 5-10 cigarettes/day
- Slightly overweight, BMI: 28
- Good erections. IIEF: 25
- No stable relationship
- Unable to penetrate
## Surgical treatment options

<table>
<thead>
<tr>
<th>Tunica plication</th>
<th>Plaque Incision/Partial Excision and grafting</th>
<th>Penile prosthesis implantation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Curvature $&lt;60–70^\circ$</td>
<td>• Curvature $&gt;60–70^\circ$</td>
<td>• Indicated when the man with PD has ED that does not respond to medical therapy (confirmed by duplex)</td>
</tr>
<tr>
<td>• No destabilizing hour-glass or hinge</td>
<td>• Destabilizing hinge</td>
<td></td>
</tr>
<tr>
<td>• Predicted loss of length $&lt;20%$ erect length</td>
<td>• Gross morphologic abnormality e.g. ring or waisting</td>
<td></td>
</tr>
</tbody>
</table>