Penile Implants for the Surgical Correction of ED Complicated by Peyronie’s Disease

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Definition

“A wound-healing disorder occurring in genetically susceptible men whose tunica albuginea responds inappropriately to trauma leading to a fibrotic, inelastic scar and penile deformity”

History

- Described in 1743
  - *induratio penis plastica*
- Physically and psychological devastating
- Poor understanding of pathophysiology
- Remains a therapeutic dilemma
Risk Factors

- Dupuytren’s contracture
- HLA-DQ5
- Paget’s disease
- Family history of PD

Genetic

- Intercourse
- Vacuum erection devices (VED)
- Penile invasive procedures
- Urethritis
- Prostatectomy
- Injection therapy (vasoactive drugs) for ED
- Catheterization

Trauma

- Diabetes
- Hyperlipidemia
- Hypertension
- Heart disease
- Smoking

Vascular

- Alcohol
- Low testosterone
- Older age

Other

1. Bjekic MD et al. BJU Int. 2006;97(3):570-574.
Clinicians should assess patients as candidates for surgical reconstruction based on the presence of stable disease. (Clinical Principle)
Natural History

- **Acute (active)**
  - Progression in plaque size and curvature deformity
  - Painful plaque and erections

- **Chronic (stable)**
  - Stable plaque size
  - Stable curvature deformity
  - Decrease of absence of pain

The psychosocial impact of PD (distress, self-image, sexual relationships, etc.) can span both phases
History Taking

- Detailed history of symptoms including onset, duration, severity, and exacerbating factors
  - Pain
  - Curvature deformity
  - Changes in length/girth
  - Distal flaccidity
- Inciting event
  - Trauma ("cracking" sensation or ecchymosis???)
- Prior treatments employed
- Evaluations by other HCPs
- Sexual history/erectile function (e.g., IIEF)
Assessment of Curvature

Clinicians may offer penile prosthesis surgery to patients with Peyronie's disease with erectile dysfunction (ED) and/or penile deformity sufficient to prevent coitus despite pharmacotherapy and/or vacuum device therapy. *(Moderate Recommendation; Evidence Strength Grade C)*

Moderate Recommendation (Grade C): Benefits > Risks/Burdens (or vice versa), Net benefit (or net harm) appears moderate, Applies to most patients in most circumstances but better evidence is likely to change confidence.
Peyronie’s Disease

Chronic Phase

Stable disease (12 mo. without pain)
Compromised or inability to engage in intercourse

No erectile dysfunction
ED responsive to medical therapy

Reconstructive Surgery

Curvature < 60°
No destabilizing deformity
Predicted length < 20%

Tunical Shortening Surgery
Nesbit Procedure
Modified Nesbit Procedures

Acute Phase
(Chronic Phase not meeting the criteria for surgery)

Medically and minimally invasive therapies

ED nonresponsive to medical therapy

Inflatable penile prosthesis (IPP)

Severe Penile curvature
Severe deformity
Severe penile shortening
>2 cm tunical defect after plaque incision

Tunical Lengthening
(Incision and grafting)
Graft materials
Autologous Grafts
Allografts
Xenografts
Synthetic Grafts

IPP alone
IPP with modeling
IPP and grafting
IPP and plication

Kadioglu A. Nat Rev Urol. 2011;8:95-106
Indications for Surgical Reconstruction

- Stable disease (> 6 months)
- Painless deformity
- Compromised/unable to engage in coitus (2o/2 deformity and/or inadequate rigidity)
- Failed conservative therapy
- Extensive plaque calcification
- Desire most rapid and reliable result
PD—Surgical Algorithm

- When rigidity adequate +/- pharmacotherapy
  
  1) Tunica plication techniques
     - Simple curve < 60 degrees
     - No hourglass or hinge-effect
     - When length ↓ <20% total erect length
  
  2) Incision/Partial Excision and Grafting
     - Complex curve > 60 degrees
     - Destabilizing hourglass or hinge

Drawbacks for Tunica Plication for PD

- Does not correct shortening
- May ↑ length loss
- Does not address hinge or hourglass
- Pain, knots, sensory changes possible
- ALL SHORTEN THE LONG SIDE OF THE PENIS!
- For every 15° of correction you lose ~ 1cm!
Drawbacks for Incision and Grafting Procedures

- May worsen pre-operative ED
  - 5-53% ED rate!
- Curvature may recur
- Penile/glans numbness a risk
- Plication sutures may still be necessary
- Prolonged recovery in some cases
- Rare, reported cases of avascular necrosis and wound healing problems
Drawbacks for IPP’s

- Infection (1-2% with coated implants)
- Penile shortening (not all from implant!)
- Mechanical failure
- Difficulty with device operation
- Diminished sensitivity (rare)
- Persistent curvature

However……..
<table>
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<th>Author</th>
<th># Pts/Time</th>
<th>Patient</th>
<th>Partner</th>
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<td>Levine (2-piece)</td>
<td>146 (1999-2004)</td>
<td>85%</td>
<td>76%</td>
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</table>

Pre-operative Consent

Set expectations regarding outcome

- **Persistent/Recurrent Curvature**
  - Goal “Functionally Straight” $< 20^\circ$
  - Insure stable disease pre-op

- **Change in length (VERY IMPORTANT)**
  - $\downarrow$ length from PD + $\downarrow$ length from IPP = 😞

- **Diminished rigidity**

- **Use implants with maximum rigidity!**

- **Decreased Sexual Sensation**
  - Rare and doesn’t usually compromise orgasm/ejaculation
Artificial Erection

- Determine direction and severity of the deformity

- My Protocol:
  - 10 cc’s of 2% lidocaine with 50 cc’s of NS
  - Manual compression

- This provides:
  - Information regarding the degree of deformity
  - Dilation of the corporal bodies
  - Post-operative analgesia
IPP Only for PD

- **Results**

- **Mulhall et al. 2004**
  - 20/22 pts corrected to <10° when <45°

- **Chaudhary et al. 2005**
  - 18/46 pts corrected to <10°

- **Chung et al. 2012**
  - 127/138 pts corrected to <10°

- **Does not matter if penoscrotal or infrapubic**

Chaudhary et al. Urology 65(4),2005
Clinicians may perform adjunctive intra-operative procedures, such as modeling, plication or incision/grafting, when significant penile deformity persists after insertion of the penile prosthesis. *(Moderate Recommendation; Evidence Strength Grade C)*

Clinicians should use inflatable penile prosthesis for patients undergoing penile prosthetic surgery for the treatment of Peyronie's disease. *(Expert Opinion)*

**Expert Opinion:** A statement, achieved by consensus of the Panel, that is based on members' clinical training, experience, knowledge, and judgment for which there is no evidence.
PD—Prosthesis/Manual Modeling

- Described by Steve Wilson in 1994
- Requires high-pressure cylinder
  - Coloplast Titan or AMS CX (Never LGX!)
- Place prosthesis first—close corportomies
- Protect pump—shod tubing
- Bend and hold x 60-90 sec
  - If <30 degrees, no additional measures needed
- Repeat PRN
IPP Modeling

Rate of urethral disruption is \(~4-5\%\)
Manual Modeling Tips

- Make certain the cylinder + RTE are same
- Leave some fluid in the cylinders (30-40%) for the first 30 days
- ~4-5% risk of urethral injury
  - If injury occurs, only remove that cylinder
- Warn patients that some curvature will persist when the penis is flaccid, but the erection will be straight.
<table>
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<th>Study (year)</th>
<th>Procedure</th>
<th>No. pts</th>
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<th>Straight (%)</th>
<th>Shortening (%)</th>
<th>Infection (%)</th>
<th>Need for revision</th>
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<td>&gt;35</td>
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<td>62</td>
<td>2</td>
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</tr>
</tbody>
</table>
IPP + Plication

- First described 2004
- Best for curvature between 30-60 degrees
- Advantages
  - Less operative time
  - ↓ risk of numbness, urethral injury, wound breakdown (no circumcision required)
  - Immediate correction of curvature
  - Quicker recovery compared to grafting

Rahman NU et al. J Urol 2004;171:2346-9
IPP + Plication

Surgical Technique

IPP + Plication

Results

A = Change in Penile Curvature?
B = Change in penile length?
C = Adequate for penetration?
D = Improvement?

IPP + Relaxing Incision

- **Techniques**
  - Relaxing Incision
  - Transcorporal Plaque Incision
  - “Scratch” Technique

- **Advantages**
  - No loss of length
  - No need for graft material or plication suture

- **Risks**
  - Penile numbness if NVB mobilized
  - Cylinder herniation
IPP + Relaxing Incisions

Surgical Technique: Incision without Grafting

Montorsi F et al. J Urol 1993;150:1819-21
IPP + Relaxing Incisions

Surgical Technique: Transcorporal Incision

Sheer O. J Sex Med 2011;8:589-93
Perito Scratch Technique

Can also use Metzenbaum scissors or a Heaney curette

IPP + Grafting

- Rarely necessary

- Main Indications
  - Severe curvature > 60 degrees
  - Large dorsal plaques
  - Ventral curvature
  - Presence of residual curve after modeling and tunical incision
  - All relaxing incisions > 2 cm

- Must warn patients about glans numbness!
IPP + Grafting

Surgical Technique

- Place the implant
- Mobilize the NVB or corpus spongiosum
- Mark and incise the plaque (Bovie < 35 W)
- Graft Material (dealer’s choice)
  - Biologics: Tachosil, SIS, Tutoplast, Acell, etc.
  - Synthetic: GoreTex (1 mm)
  - Autologous: Saphenous vein, fascia lata, etc.
- Suture: 4-0 PDS or GoreTex
- Drain with a TLS drain
IPP + Grafting
Surgical Technique

Courtesy of L. Levine
IPP + Grafting

Surgical Technique

Courtesy of L. Levine
IPP + Grafting

Surgical Technique

Courtesy of L. Levine
IPP + Grafting

Surgical Technique

Courtesy of L. Levine
Dorsal-Ventral Patch
“The Sliding Technique”

- First described in 2012
- Based on 3 key elements
  - Sliding maneuver for restoration of length
  - Ventral or dorsal incisions for ↑ girth
  - With or without graft (SIS)
  - Buck’s fascia used to close tunical defects rather than SIS Graft

Egydio PH et al. BJUI 2015: PMID: 25644141
Dorsal-Ventral Patch
143 consecutive patients (77 with PD and ED)

Mean age 56 (40-72)

Operative Time
- Malleable Implant (n=133), 93 (64–122) min
- Inflatable (n=10), 121 (100–164) min

Mean length improvement 3.1 cm (2-7 cm)

No infections, 3 hematomas

IIEF ↑ from 24 at baseline to 60 at 6 mo.

Egydio PH et al. BJUI 2015: PMID: 25644141
Take Home Points

- PD is not a rare disorder -- >10% of men over 50!
- PD frequently associated with ED -- 50-90%
- There is no non-surgical “cure” for PD
  - Surgical treatments are imperfect
- Psychological issues in every patient
- Diagnosis is easy, treatment remains a challenge
- Informed consent is critical
- Don’t over promise!
Questions?

Thank goodness for IPPs!!!