Penile Prosthesis Implantation
Fried Symposium
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Management of ED

All Patients

Sexual/Medical History

Physical Exam

Laboratory Tests

Discuss Options

Noninvasive Tx
  (Oral, VED, MUSE, PEP)

Additional Tests
  (NPT, Doppler, DICC)

Surgical/Invasive Tx
Penile Prosthesis History

- Bogaras (1936) - Rib cartilage
- Frumkin (1943) - Rib cartilage
- Scardino (1950) - Acrylic stent
- Goodwin & Scott (1952) - Acrylic stent
- Lash (1964) - Silicone implant
- Pearman (1967) - Trimable silicone implant
- Morales (1973) - Intracavernosal implant
- Small & Carrion (1973) - Intracavernosal implant
- Scott (1973) - Inflatable implant
Types of Prostheses

• Malleable/semirigid
  – AMS, Coloplast, Jonas

• Mechanical rod
  – AMS Dura II

• Inflatable
  – 2-piece – AMS Ambicor
  – 3-piece –
    • AMS 700 (CX, CXR, LGX)
    • Coloplast (Alpha-1, Titan, Narrow Base)
Penile Prosthesis Modifications

• Single tubing connectors
• Lock-out valve in fluid reservoir or pump to prevent autoinflation
• Parylene Coating
• Pump Improvements
  – MS (AMS)
  – OTR (Coloplast)
• Prevention of infections
  – Antibiotic-impregnated coating (InhibiZone™, AMS)
  – Hydrophilic/anti-adherence surface (Titan, Mentor)
Penile Implant Indications

- Oral drug (PDE5 inhibitor) failure
- Radical Prostatectomy
- Diabetes mellitus
- Cardiovascular
- Scarred penis
  - Priapism
  - Previous implant
  - Trauma
- Peyronie’s disease
- Severe venous leak
Issues Regarding Informed Consent

- Size of penis—usually slight loss in penile length
- Possible need for revision surgery
  - Infection
  - Malfunction
  - Tissue damage
- Sensation
- Ejaculation
- Discuss alternative treatments, eg, vacuum constriction device (VCD), Medicated Urethral System for Erections (MUSE), Pharmacologic Erection Program (PEP), etc
- Variety of prostheses
- Reduced erectile function if device removed
## Reliability—Device Survival

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Device</th>
<th>Survival Rate</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milbank pre1992</td>
<td>Ultrex</td>
<td>78%</td>
<td>5 years</td>
</tr>
<tr>
<td>Levine</td>
<td>Ambicor</td>
<td>93%</td>
<td>3-5 years</td>
</tr>
<tr>
<td>Choi</td>
<td>CXM</td>
<td>90%</td>
<td>5 years</td>
</tr>
<tr>
<td>Carson</td>
<td>CX</td>
<td>86%</td>
<td>5 years</td>
</tr>
<tr>
<td>Montorsi</td>
<td>AMS700</td>
<td>96%</td>
<td>5 years</td>
</tr>
<tr>
<td>Wilson</td>
<td>Mentor Alpha-1</td>
<td>93%</td>
<td>5 years</td>
</tr>
<tr>
<td>Govier</td>
<td>3 Piece Impant</td>
<td>91%</td>
<td>3 years</td>
</tr>
<tr>
<td>Dubocq</td>
<td>Mentor</td>
<td>96%</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td>AMS</td>
<td>84%</td>
<td>5 years</td>
</tr>
</tbody>
</table>
## Patient/Partner Satisfaction

<table>
<thead>
<tr>
<th></th>
<th>Patient</th>
<th>Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carson</td>
<td>93%</td>
<td></td>
</tr>
<tr>
<td>Levine</td>
<td>96%</td>
<td>91%</td>
</tr>
<tr>
<td>Montorsì</td>
<td>98%</td>
<td>96%</td>
</tr>
<tr>
<td>Chiang (Taiwan Series)</td>
<td>87%</td>
<td>71%</td>
</tr>
<tr>
<td>Montorsì (Peyronie’s)</td>
<td>79%</td>
<td>75%</td>
</tr>
</tbody>
</table>
Satisfaction Questions

• “Would you undergo the procedure again?”
  – Yes: 154 (86.5%)
  – No: 20 (11.2)
  – Not sure: 4 (2.2)

• “Would you recommend implant surgery to a friend?”
  – Yes: 157 (88.2%)
  – No: 19 (10.7)
  – Not sure: 2 (1.1)

Carson et al J. Urol 2000
Reasons for Dissatisfaction With Penile Implant

• Loss of penile length
• Loss of sensation
• Mechanical malfunction
• Reduced sexual spontaneity
• Unrealistic expectations
• Cost
### Table 2. Predictors of post-operative penile length

<table>
<thead>
<tr>
<th>Predictors of postoperative inflated penile length</th>
<th>Linear regression</th>
<th>P-value</th>
<th>Spearman correlation coefficient</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stretched penile length</td>
<td>0.71</td>
<td>&lt; 0.001</td>
<td>0.8</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Pharmacologically induced erect penile length</td>
<td>0.83</td>
<td>&lt; 0.001</td>
<td>0.9</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Median PSV</td>
<td>-0.04</td>
<td>0.66</td>
<td>-0.07</td>
<td>0.76</td>
</tr>
<tr>
<td>Median EDV</td>
<td>-0.05</td>
<td>0.97</td>
<td>0.08</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Abbreviations: EDV, end diastolic velocity; PSV, peak systolic velocity.
Penile Prosthesis

Pros

• High patient satisfaction rate
• 7 to 10 years average functional prosthesis life
• Higher spontaneity than medications
• Discreet, normal appearance
• Erection longevity controllable
• Significant clinical data on procedure and results
• Erection hard enough for penetration, allowing patient to complete sexual intercourse
Penile Prosthesis

Cons

• Potential for infection, device malfunction
• Major surgery
• Postoperative pain
• Irreversible
• Additional surgery at product end-of-life
• Potential decreased sensation, glans sensitivity, ability to ejaculate/reach orgasm
• Complications: infection, device malfunction with replacement/salvage surgical procedure
• Cost/insurance reimbursement
Implant Surgical Technique

• Infrapubic approach
  – Familiar surgical approach for urologists
  – Easy placement of reservoir
  – Potential injury to dorsal penile nerve

• Penoscorpotal approach
  – Easy dissection and corporal dilation
  – Penile nerves not in surgical field
  – Blind placement of reservoir sometimes difficult
## AMS 700 CX: Surgical Approach

<table>
<thead>
<tr>
<th>Approach</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penoscrotal</td>
<td>161</td>
<td>43.3</td>
</tr>
<tr>
<td>Infrapubic</td>
<td>204</td>
<td>54.8</td>
</tr>
<tr>
<td>Unknown</td>
<td>7</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Carson et al J. Urol 2000
Challenging Problems with Penile Implants

- Distal cylinder erosion
- SST deformity
- Proximal cylinder erosion
- Severe Corpus cavernosum fibrosis
- Implant Infection
Difficulty dilating corpora

- Fibrotic Corpora due to
  - Peyronie’s Disease
  - Priapism
  - Pharmacologic Erections
  - Secondary Implant
  - Trauma
  - Infection
What do you do if you have a fibrotic corpora?

- Virgin Corporotomy site
- Mid/distal corporal incision
- Multiple corporotomies
- Excise fibrotic core
  - Urethratome
  - Corporal resection
- Use a single cylinder
- Cavernosal Reconstruction
- Narrow Base Cylinders
Corporal Fibrosis

Instruments

- Metzenbaum scissors
- Curved and straight Mayo scissors
- Large Kelly Clamp
- Brooks dilators
- Hegar dilators 8 – 16mm
- Dilamezinsert instrument
- Rossello Cavernotomes
- Otis Urethrotome
Corporal Fibrosis

Options to consider

- Have all instrument available at outset
- Resection of fibrous cavernosal tissue
- Additional Distal corporotomy
- SIS/Tutoplast graft
- Windsock (Goretex/Dacron)
- RTE suture
Corporeal Perforation

- Can occur distal, proximal, lateral
- What do you do?
- Wind sock (Gortex, Dacron, Tissue)
- Repair Corpora
- Suture in rear tip
Proximal Perforation

- Weak Tunica proximally
- Surgeon perforates near crus
Distal (corporal and urethral) Perforation

- Occurs during dilation of corpora
- Fix with distal corporoplasty
- Single cylinder implantation (plug)
- Allow urethral perforation to heal over catheter and re-operate 2+ months
- May place NB cylinders if due to fibrosis
Cylinder/Pump Erosion

- Due to urethral catheters
- Decreased penile sensation
- Irradiation
- Cortisone
- Urethral strictures
- Previous erosion
- Infection
Infection

Incidence

• 1-3% - Primary procedures
• Up to 10% - Secondary procedures
• How (Signs and symptoms)
  – Persistent pain
  – Fixation of pump
  – Purulent drainage
  – Exposed foreign body
• Rarely
  – Fever
Salvage Irrigations

- Antibiotics – Vancomycin + Gentamicin
- ½ Strength Hydrogen Peroxide
- ½ Strength Betadine

Pressure Wash with Vancomycin-Gentamicin Solution

- ½ Strength Betadine
- ½ Strength Hydrogen Peroxide
- Antibiotics Vancomycin +
Summary: Penile Implant Surgery

- Available (malleable and inflatable types) less than 40 years
- For men who fail less invasive ED treatment
- Relatively expensive and invasive
- Provide the highest rate of long-term satisfaction for patients and partners of all ED treatments
- Recent product modifications provide higher patient success, satisfaction and longevity rates
- Surgical implantation of penile implants for severe ED likely to remain in urologist’s treatment armamentarium