Evolution of Penile Prosthesis Surgery in the Last 40 years

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The Most Important Evolution In Penile Prosthesis Surgery Concerns Device Infection.

1. Infection Retardant Coatings & other maneuvers have significantly reduced device infections
2. The bacteria causing device infection have changed
3. The opportunity for salvage surgery has been reduced
Initially rods, self contained, 2 piece were more popular with urologists.

Now IPP in 90% USA patients.

Pictures courtesy John Mulcahy.
The rods, unitary, 2 pc were more popular initially because IPP failed so often. Over 40 years the IPP has become the most dependable implant placed in humans\(^1\). The game changers: better connectors, better cylinder material, infection retardant coatings.

5 year survival IPP: infection <1\(\%\)^2 mechanical failure <5\(\%\)^1

2. Eid JF et al. Coated implants and “no touch” decreases risk in IPP to 0.46\(\%\). Urology 2012; 79: 1310
# 2 Evolution: Incision Location

Perineal > Infrapubic > Penoscrotal > Subcoronal

After 40 yrs ... a new incision ...

**SUBCORONAL**

Popular with physicians doing implants as outpatient (Valenzuela in USA), under local anesthesia (Park in Korea), and sliding procedures for lengthening (Egydio in Brazil)

Because of reservoir reluctance, the occasional implanter selects only easy anatomy

Traditional location
75% of IPP done by Drs who implant 4-10 IPP yearly. Only 20% USA urologists do 1/year.
1.5% USA urologists do >10% IPP
Occasional implanter selects anatomically correct patients.
Ectopic or abdominal wall placement can be done safely on anybody.


Low hanging fruit
Bad Things Can Happen During Retroperitoneal Placement

Intraperitoneal Reservoir
Reservoir in bladder
Reservoir hernia

Causes "blue leg"
Causes bowel fistula
Bleeding you can “hear”
Ectopic Means Intrabdominal Wall Placement of Reservoir aka High Submuscular

“Ectopic” reservoir first described in 2002 when lock out valves placed on IPP⁶
Perito made reservoir less palpable and less hernia when placed with nasal speculum⁷
Morey got it even higher with lung clamp… “high submuscular”⁸
We now know… “the higher and more medial, the better”
We have already seen low volume implanters double yearly

Implant volume after adopting new location for reservoir

Traditonal thinking was to undersize: Rods and AMS Ultrex cylinder Strategies

Repeated inflation of cylinders will act as tissue expander⁹

Deliberately oversized cylinders coincident with daily inflation gets bigger penis¹⁰ ¹¹

There is a documented trend in USA toward longer cylinders & fewer RTE¹²

Oversizing & aggressive post op inflation results in Longer cylinders & longer Penis¹¹

10. Sellers T et al. Vacuum prep, optimization cylinder length & daily inflation reduces complaints ... J Urol 2013 suppl
#5 Evolution: ED & Peyronie’s Treated with IPP
upwards of 40% need no Additional Adjunctive Measures

Modeling supplanted degloving & plaque removal/grafting with IPP
Dr Scott actually dreamed of modeling but his cylinder was not strong enough
Usage of implant will act as tissue expander correcting ≤ 30° & cicatrix
Effective in 83% - 98% of Peyronie’s patients.
Many physicians fretted about urethral damage & penis not completely straight

Critics to modeling complain penis not completely straight at conclusion of surgery

To achieve a completely straight penis immediately after IPP, these adjunctive procedures have lately been offered in lieu of modeling:

- IPP & plication.
- IPP & tunical incision.
- IPP & tunical scratch
- IPP plaque excision/grafting
- IPP & plaque excision/grafting with Tachosil®

17. Ralph et al. BJU int 2011; 108:1152
# 6 Evolution of Device Infection over Last 40 years

Infection retardant coatings introduced in 2001 (AMS) & 2002 (Coloplast)

Infection incidence has decreased from 4% to <1% in virgin implants -- (2.2%) diabetics

Infection incidence (with washout) has decreased from 10-18% in Revisions to 2% \(^{20}\)

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20. Wilson SK, Christine B. Current Thinking on Penile Prostheses. AUA Update 2010; lesson 40, 29: 405-416
Eid’s Study: 2000 total implants: both companies
Infection reduced from 5% to 2% with coated implants
Infection further reduced to .46% by “no Touch”

Stop washing with Betadine! Only Prep with Alcohol Based Solution

ChloraPrep® impregnated sponge

Cease the 10 minute wash with Betadine® soap and the Betadine solution painting
Simply shave site immediately before surgery and use two alcohol based prep swabs
Allow 3 minutes to dry and surgical site infections reduced 40%22

22. Dariouche RO. Chlorhexidine Alcohol vs povidone-iodine for surgical site antisepsis. NEJM 2010; 362:18
**Bacterial Formation of Biofilm Makes Prosthetic Infections Unique**

“Henry’s multi institutional studies changed the infection paradigm”

70% IPP patients have culture positive bacteria in implant spaces at revision surgery\(^{23}\)
Washout & component exchange decreases infection rate of revision surgery\(^{24}\)
Washout following prosthesis removal decreases positive culture at revision\(^{25}\)
Electron microscopy shows biofilm on all IPP components removed\(^{26}\)

\(^{23}\) J Urol 2004; 172:153
\(^{24}\) J Urol 2005; 173:89
\(^{25}\) J Urol 2006; 176:186
\(^{26}\) J Urol 2006; 176:1008
Today’s IPP Infections Are Different from Non Coated Implant Era  

Unfortunately, in the era of infection retardant coated implants, analysis of USA hospital records of 1557 device infections showed only 17.3% salvage attempt in USA


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New Series of Coated IPP infections Shows Drastic Change in Infecting Organisms & Poor Salvage results

High volume implanter (Kava) offered salvage aggressively
Only 47% were offered salvage (others too sick)
Only 2/3 were successful vs. >80% in non coated era

Less than 1/3 of all the infected patients had successful salvage

<table>
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<th>Cultures</th>
<th>First Time (N=14)</th>
<th>Revision (N=24)</th>
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<tr>
<td>Gram positive</td>
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<td>Strep. Intermedius</td>
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<td>Strep. pneumoniae</td>
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<tr>
<td>Staph epidermidis</td>
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<td>Staph aureus (3MSRA)</td>
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<tr>
<td>Staph aureus (2 MSRA)</td>
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<tr>
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<tr>
<td>No Growth</td>
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</table>

34 infections
38% skin organisms
62% toxic organisms

What is the take Home Message on IPP Infections?

Infections reduced drastically by retardant coatings, alcohol prep, no touch, & washout

In the era of the coated implant, infections are usually systemic & toxic to patients

While rare, today’s infections often caused by bad bugs and salvage usually not an option
For a Treasure Trove of Prosthetic Urology Videos

www.vjpu-isson.info or google VJPU

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