Post-prostatectomy Incontinence

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Unresolved Issues in the surgical management of PPI

- Definition of PPI
- Patient selection
- Nuances of surgical technique
- Treatment of PPI

Loughlin and Prasad J Urol 2010, 183, 871-7

Continence Status and Satisfaction after RP

- 143 men at > 6 months (av 37 months), 12 question self-administered Q.
- 44% continent, 48% “socially continent” (<2 UI per day), 8% incontinent
- Although leakage incidence was 56%, 89% of men were satisfied (would have RP again)

Demirkesen et al, Int Urol Nephrol, 2007, 531-6

Note: this is a similar dry rate to TVT/TOT/AUS

Discrepancies in perception of UI between patient and physician after robotic assisted radical prostatectomy (RARP)

Of 238 consecutive men who had had RARP
Method: 66 men entered
- IOIQ-SF
- Physician interview about number of pads used and considered complete continence to be equivalent of no pads or safety liners
Results: 66 patients
- Physician reported 34 (52%) complete continence
  - of 34, only 5 reported no leakage
  - of 34, 11 patients who wore no pad did have leakage (small/moderate) at least once per day

Lee et al Yaisei Med J 2010 51 883-7

Continence definition after RP

Liss et al, J Urol 2010, 183, 1464-8

- 500 men after RALP
- Asked about
  - daily pad usage (0, security, 1, >1)
  - urine leakage (daily, once week, <once week, none)
  - urinary control (none, frequent dribble, occ dribble, total control)
  - AUA SS
  - urinary QoL
- Results
  - no pad SS 5.8 QoL 1.6
  - security pad SS 7.6 QoL 2.8
  - 1 pad SS 9.2 QoL 3.4
- Conclusion: continence should be defined as no pads

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Types of UI after RP

- Types of incontinence
  - SUI: most prevalent
  - UUI
  - Mixed (SUI/UUI): common
  - Post micturition dribble, rarely mentioned

- Most papers do not distinguish between UUI and SUI


- 92 men had pre-op UDS and completed 1 year follow-up after RP
- 64 had no UD abnormality: only 2 had UI post-op
- 28 had abnormal urodynamics: 11 had UI after RP
  - DO in 12
  - “weak sphincter mechanism” in 9
  - both DO and weak sphincter in 7: 4 had UI post-op
- Majoras et al NAU 2006, 25, 2-7 also found that higher pre-operative MUCP and voluntary squeeze predicted continence in a group of 63 men
- Thiel et al Urology 2007, 69, 315-9 found no predictive clinical or urodynamic factors of poor outcome (failure > 1 pad/day)

Pre-existing OAB/DO and RP

- Some evidence that persistence of OAB after TURP related to
  - severity of OAB pre-operatively
  - age of patient
- No evidence for cancer patients
  - need pre-op surveys using simple questionnaires like ICIQ SF
  - need pre-op UD studies in large group to investigate mechanisms
  (Porena et al, Review in Eur Urol 2007)

Effect of preoperative urodynamic detrusor overactivity on post-prostatectomy incontinence: a systematic review and meta-analysis.

METHODS:
- The period of search: January 1989 to December 2014.
- A total of nine articles met the eligibility criteria for this systematic review.
- The eligible studies included a total of 457 patients with a median number of 58 patients per study (range 17-92). Of the nine studies, five conducted open retropubic radical prostatectomy (RRP), two performed robot-assisted laparoscopic prostatectomy (RALP), and two others utilized multiple modalities.
- PPI was more likely to occur in patients with preoperative DO (pooled odds ratio (OR) 2.30; 95% confidence interval (CI) 1.39-3.82; studies 9; participants 419), as compared to patients who were DO negative.

CONCLUSIONS:
- Meta-analysis results suggest that preoperative DO is another possible underlying mechanism for PPI.
- Urodynamic detrusor overactivity (DO) contributes to post-prostatectomy incontinence (PPI).

Pelvic Floor Thickness: predicts UI after RP?
Kagebayashi, Hinyoikika Kiyo, 2010, 56:147-50

- 49 men
- MRI used to measure pre-op thickness
- At 3 and 6 months difference between men with and without UI (p=0.006 and p=0.02)
- Conclusion: Thin pelvic diaphragm may predict a slower recovery in continence
  - likely to affect OAB too if PFE less effective
Changes in Urodynamics after RP

- 66 men, 44 reinvestigated 8 months after RP
- DO found in 32%: no case of UI due to DO post-op
- UPP was "significantly reduced" in all men post-op
- Sphincter deficiency principal cause of UI after


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- Stricture dilated UI worsened
- Using Convene day and night

WHAT NEXT?

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- Antimuscarinics failed
- BTXA failed
- Physio failed
- Referred for video UDS
- On exam: good pelvic floor contraction

MH Voiding

MH Video
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- Urodynamic question: is he suitable for an AUS or sling?
- Management?
  - Investigations?
  - Therapy?
- What’s the evidence?

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Management of PPI

- Conservative: PFEs for 12 months
- Drug treatment: Duloxetine
- Surgical treatment

Resolution of UI and ED 12 months after RP (MAPS Study)

- 691 of 742 men with UI 6 weeks post-op
- At 12 months
  - open RP: 76% had UI, 81% had ED
  - lap RP: 79% had UI, 78% had ED
- 411 with UI entered an RCT of 4 physiotherapy sessions in 3 months or standard management
- No difference 76% and 77% in UI prevalence at 12 months

Glazener et al, Lancet 2011, 378, 9788

Management of PPI

- Conservative: PFEs for 12 months
- Drug treatment: Duloxetine
- Surgical treatment

Duloxetine for mild to moderate Post Prostatectomy

Incontinence: preliminary results of a RCT
Cornu et al Eur Urol 2011:59,148-54

- 31 men
  - UI episodes: -52% dulox versus +19% placebo
  - Qu 3 ICIQ-SF, p<0.02 in duloxetine group
- Conclusion: duloxetine is effective in treatment of UI and improves QoL in SUI after RP
Management of PPI

- Conservative: PFEs for 12 months
- Drug treatment: Duloxitine
- Surgical treatment

PPI: Urodynamic Technique

- Video
- UPP or ALPPs
- Outcome of studies
  - show USI
  - show DOI
  - show USI and DOI
  - negative findings?

SUI Surgery after RP

- AUS remains gold standard
  - ICUD Consultation on Incontinence 2012
  - ICI-RS review paper NAU 2015
- Other treatments
  - slings: retropubic, obturator, and adjustable
  - ACT balloons
  - injectables
- Need for RCTs to show efficacy of other treatments (NICE Guidelines for Male Incontinence 2010, updated 2014)

Male Slings

- No RCTs
- Types of Male Slings
  - Bone anchored
    - Invance
  - Adjustable
    - Argus®, Reneex®, ATOMS®
  - Fixed Transobturator
    - Advance (XP)®, (I-STOP) TOMS®

Argus Surgical System

(1) Argus adjustable male sling
(2) Washer Positioners
(3) Needles
(4) Washers
(5) Ruler

In case it is necessary to improve the performance of the device, the manufacturer reserves the right to modify the technical specifications without prior notice.

Male sling reports in PubMed 2013-2015 (to 1.5.2015)

12 papers:
- Mini Quick Anchor plus: 8 men
- TOMS: 40 men
- Argus (adjustable): 17men
- ATOMS (adjustable): 99 men
- AdVance: 2 men

None of these were RCTs, all were case series, with variable follow-up, definitions of success and outcome measures.

Therapeutic durability of the male transobturator sling: midterm patient reported outcomes.

- RESULTS:
  - A telephone survey and chart review
  - Quantitative success was defined as a decrease to 2 or fewer pads per day.
  - RESULTS:
    - Quantitative success decreased from 87.3% to 62.5% and pad use doubled from a mean±SD of 0.8±1.7 to 1.7±2.5 pads per day. Patient determined success was 53.6% at 2 years.
    - A subgroup of 25 patients interviewed at 7 and 29 months after sling surgery had quantitative success significantly decrease by 20% (p=0.03), subjective success decrease by 4% (p=0.56) and pad use significantly increase (p=0.01) from 1.4±2.2 to 2.3±3.2 pads per day.

- CONCLUSIONS:
  - Most patients receiving the AdVance sling did see improvement in post-prostatectomy incontinence and a decrease in pad use, but in 20% of patients, this benefit decreased with time. Nevertheless, patients remained satisfied and perceived the treatment as successful.
Continence and complications rates after male slings as primary surgery for post-prostatectomy incontinence: a systematic review.


- METHOD: A MedLine search using specified search terms was done on January 23, 2012. This research rendered 160 records.

- RESULTS: No controlled trial was available for analysis. The majority of papers dealing with outcome and complications came from a few centres. At a median follow-up of 15 months the pooled cure rates for all kinds of slings was 77.4%; in the AdvanCe group the pooled cure rates was 72.5%; in the InVance group it was 74.2% while in the Remex group it was 84.3%.

- CONCLUSIONS: The pooled overall cure rates is high but, the statistically pooled results obtained should be interpreted with caution because of several limitations due to several study selection limitations: observational study design, few number of analysed studies, heterogeneity, lack of outcome definition and standardisation, between-study variability, high risk of bias.

Injectable technique

- Retrograde
- Antegrade


EVIDENCE ACQUISITION:
- Inclusion criteria were: number of patients higher than 30, mean follow up longer than 12 months and definition of a successful outcome as the use of 0 to 1 safety pads a day.

EVIDENCE SYNTHESIS:
- 113 papers underwent primary review. 51 papers met the inclusion criteria with a total sample size of 4022 patients.
- Efficacy (0-1 safety pads) was on average 65.7% for AUS, 48.2% for Invance Sling, 48.4% for Advance Sling, 64.2% for ProACT. Twenty four hour pad test and QOL questionnaires were respectively available only in 4 and 18 studies.
- The overall complication rate was 19.43% for AUS, 7.4% for Invance Sling, 12.3% for Advance Sling, 12.3% for ProACT.

CONCLUSIONS:
- Due to the poor overall quality of available studies, it was impossible to identify or refute clinically important differences between the alternative surgical procedures.
- Although our data seems to suggest that AUS has the highest efficacy in the treatment of SUI following RP it is also associated with the highest complication rate, but this may be due to the longest follow up.
- Larger rigorous trials are needed in order to support this evidence.

What are US surgeons choosing?

N=1246
AUS: 35% (stable)
Sling: 36% (15% to 51%)
Bulking: 29% (52% to 16%)
SUI Surgery after RP

- AUS remains gold standard
  - ICUU Consultation on Incontinence 2008
  - ICI-RS review paper NAU 2010
- Other treatments
  - injectables
  - slings: retropubic, obturator, and adjustable
  - ACT balloons
- Need for RCTs to show efficacy of other treatments (NICE Guidelines for Male Incontinence)

PPI: AUS v Male sling

- Which is the best operation?
- WE DO NOT KNOW!

Problems in agreeing the protocol for an RCT

- “AUS is overtreatment for mild/moderate SUI”
- “Slings don’t work in moderate/severe SUI”
- Measuring urine loss, which pad test, or just the patient’s statement?
- Defining cure, measuring QoL and assessing satisfaction

Designing an RCT for the surgical treatment of SUI after RP

- AUS is the gold standard, but which other device should be compared?
- What should be the primary outcome measure be, subjective or objective?
- What objective measures should be used?
- How should QoL and patient satisfaction be assessed?
Male synthetic sling versus Artificial urinary Sphinicter Trial for men with urodynamic stress incontinence after prostate surgery: Evaluation by Randomised controlled trial (MASTER)

MASTER: Planned inclusion/exclusion criteria

Inclusion criteria
1. Adult men who have decided in discussion with their urologist to have surgery for urodynamic stress incontinence (USI) resulting from prostate surgery.
2. Men who are willing to be randomised between male sling and AUS.

Exclusion criteria
1. Men who have had previous male sling or AUS surgery.
2. Men with unresolved bladder neck contracture or urethral stricture after prostate surgery.
3. Men who do not consent to be randomised (these men will be asked to consent to follow up).
4. Men with insufficient manual dexterity to operate AUS device.
5. Men who are unable to give informed consent or complete trial documentation.

MASTER: Objectives

Principal objectives
1. What is the clinical effectiveness of implantation of the male sling compared with AUS in terms of self-reported incontinence at 12 months?
2. What is the cost effectiveness of a policy of primary implantation of the male sling compared with AUS, measured by incremental cost per quality-adjusted life-year (QALY) at 24 months?

Secondary objectives
3. What are the harms of each type of surgery?
4. What are the costs of the benefits and harms of each treatment policy?
5. What subsequent NHS services (including repeat surgery) are needed for men with persistent or recurrent problems?
6. What are the differential effects of the operations on other outcomes such as quality of life and general health?
7. How satisfied are the men with each procedure?

MASTER: PROTOCOL SUMMARY

• QUESTION ADDRESSED
Is a male sling or an artificial sphincter better for men with urodynamic stress incontinence (USI) after prostate surgery?

• CONSIDERED FOR ENTRY
Men with USI after prostate surgery (radical prostatectomy or TURP), for whom surgery is judged appropriate

• POPULATION
Men with USI after prostate surgery

• TRIAL ENTRY
Eligible and consenting men. Consent will be obtained from men after written and oral information has been provided.

• INTERVENTIONS
1. Male Sling (MS)
2. Artificial Urinary Sphincter (AUS)

• OUTCOME ASSESSMENT
All men who consent – Postal questionnaires and urinary diaries at 6, 12 and 24 months after the date of their incontinence surgery. Health care utilisation questions at 6, 12 and 24 months
Randomised men only – 24 hour pad test at 12 months following surgery.
**ICIQ-UI Short Form**

6 When does urine leak? (Please tick all that apply to you)

- never – urine does not leak
- leaks before you can get to the toilet
- leaks when you cough or sneeze
- leaks when you are asleep
- leaks when you are physically active/exercising
- leaks when you have finished urinating and are dressed
- leaks for no obvious reason

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- Prevention of PPI: nuances of RP surgical technique

*Loughlin and Prassad J Urol 2010, 183, 871-7*

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**Prevention of PPI: Nuances of RP surgical technique**

- Approach: open, LARP, and RARP
- Preservation of:
  - pubo-prostatic ligaments
  - bladder neck
- Rocco stitch to reconstruct the posterior reconstruction of the rhabdosphincter
- Peroperative preservation of the intraprostatic rhabdosphincter
- Preservation of the neuro-vascular bundles

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**ORIGINAL RESEARCH**

Comparison of open and robotic-assisted prostatectomy: The University of British Columbia experience

<table>
<thead>
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<th></th>
<th>Open</th>
<th>Robotic</th>
<th>P value</th>
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<tbody>
<tr>
<td>Incontinence</td>
<td></td>
<td></td>
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<tr>
<td>(&gt;1 pad per day)</td>
<td></td>
<td></td>
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<tr>
<td>At 6 months</td>
<td>18/160 (11.3%)</td>
<td>24/169 (14.2%)</td>
<td>0.5091</td>
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<tr>
<td>At 12 months</td>
<td>7/145 (4.8%)</td>
<td>7/152 (4.8%)</td>
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Stimulation of the Neurovascular Bundle Results in Rhabdosphincter Contraction in a Proportion of Men Undergoing Radical Prostatectomy.

MATERIALS AND METHODS:
- Nerve conduction studies were performed before and after prostate removal.
- The St Mark’s pudendal electrode was used for pudendal (control) stimulation. The ProPep Nerve-Monitoring System® (ProPep Surgical, Austin, TX), was used to stimulate the neurovascular bundle at the level of the prostate base, mid and apex.
- ProPep® needle electrodes inserted into the rhabdosphincter were used to measure evoked compound motor action potential response.
- Results were only included if a valid pudendal control was elicited.

RESULTS:
- Seventeen men in total underwent investigation. Valid measurements were obtained after initial quality control in seven of seventeen men.
- In two cases, evidence of sphincteric activation was observed, providing evidence to support neurovascular bundle innervation of the rhabdosphincter.
- In the other five patients, no intrapelvic nerve supply was demonstrated.

CONCLUSION:
- Somatic nerve supply to the rhabdosphincter is variable.
- Direct intrapelvic supply to the rhabdosphincter may exist in some men.
- This may be one explanation as to why some patients unexpectedly develop severe urinary incontinence post-operatively.

Conclusions
- PPI is underestimated
- More research is needed to prevent and predict PPI
- Case series consistently exaggerate success rates.
- Patient reported outcomes must be used and include satisfaction
- There needs to be agreed definitions of success
- There needs to be better evidence for alternatives to AUS
- Only RCTs provide high quality data