ROBOTICS: WHAT DO THEY OFFER US?
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Monday December 1st Glaziers Hall

- Intuitive Surgical
- Ethicon/J&J
- GSK
- Takeda

Conflicts of Interest

- Active Surveillance
- (Robotic) Radical Prostatectomy
- Brachytherapy
- External Beam Radiotherapy + hormones
- Brachytherapy + EBRT (no hormones)
- Alternatives
  - HIFU
  - Cryotherapy
  - Focal Therapy

Robotic Prostatectomy

- The components and potential advantages
- Robotic surgical systems in the UK
- Morbidity of RARP
- The oncological outcomes
- The functional outcomes
- The challenges of robotics
- Training and mentoring in robotic surgery

NICE 2008/14 Guidance

Localised prostate cancer

<table>
<thead>
<tr>
<th>Treatment &amp; management options</th>
<th>pT2N0</th>
<th>pT3aN0</th>
<th>pT3bN0</th>
<th>pT1-3 N+</th>
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</thead>
<tbody>
<tr>
<td>Radical surgery (radical prostatectomy)</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Brachytherapy</td>
<td>✔</td>
<td>✔</td>
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<td>✔</td>
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<tr>
<td>Combined radical therapy</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Chemotherapy</td>
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<td>✔</td>
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<tr>
<td>High intensity focused radiation (HIFU)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>&lt; 1% mortality</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>20-30% blood transfusion</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>9-30% complications</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Hospital stay 6.4 days</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>&lt;10% incontinence</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>14-44% erectile dysfunction</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

Previous Gold standard

- Mortality <1%
- Bleed transfusion 20-30%
- Complications 6-30%
- Hospital stay 6-8 days
- Incontinence <10%
- Erectile dysfunction 14-44%

Radical Prostatectomy Issues

- Cancer control- Margins and PSA
- Continence
- Potency
- Complications
- Return to normal activity/ general wellbeing-quality of life

Open radical prostatectomy

- Previous Gold standard
- Data				
- Mortality <1%
- Bleed transfusion 20-30%
- Complications 6-30%
- Hospital stay 6-8 days
- Incontinence <10%
- Erectile dysfunction 14-44%
NICE 2014
Radical Prostatectomy

- Commissioners of urology services should consider providing robotic surgery to treat localised prostate cancer. [new 2014]
- Robotic systems are cost effective by basing them in centres expected to perform >300 RARP’s per year. [new 2014]
Randomised Controlled Trial: Comparing Laparoscopic and Robot-assisted Radical Prostatectomy, 2013

- 60 vs 60 pts Italy
- No difference in pathology: margins
- The continence rate was higher in the RARP group at every time point
  - 3 month 80% vs 61.6% LRP (p=0.044)
  - 1yr 95.0% vs 83.3%, respectively (p=0.042).
- Among preoperative potent patients treated with nerve-sparing techniques, the rate of erection recovery was 80.0% vs 54.2% LRP (p=0.020).

Vickers and Scardino, 2008

The evidence for...

Competing-Risks analysis of Survival

- After RP, RT and Observation
- 17 SEER registries on 404,604 localised prostate cancer pts
- Cancer-specific and other cause mortality
- In low and intermediate risk: RP best
- In high risk…


- Excellent (better than RRP) perioperative outcomes
- Equivalent (early and intermediate) oncologic outcomes
- Significantly better functional (continence and potency) outcomes

EBM for RARP: where are we?

- Excellent (better than RRP) perioperative outcomes
- Equivalent (early and intermediate) oncologic outcomes
- Significantly better functional (continence and potency) outcomes

Downsides of RARP

- Cost
- Availability
- Learning Curve
- Training
- Case Volume
- Team

Fellowship Training

Melbourne, Australia, supported by TUF grant.
Outcomes evaluated

- Perioperative:
  - operative time, blood loss, transfusion rate, overall complication rates

- Oncological:
  - positive surgical margins, bDFS, OS and CSS

- Functional:
  - urinary continence and potency recovery

Operative time: RARP series

Blood loss: RARP series

Transfusion rate: RARP series

Overall complications: RARP series
Overall complications: RARP Vs RRP

Novara G, Ficarra V. et al (unpublished data)

Overall complications: RARP Vs LRP

Novara G, Ficarra V. et al (unpublished data)

Outcomes evaluated

- Perioperative
  - operative time, blood loss, transfusion rate, overall complication rates

- Oncological
  - positive surgical margins, bDFS, OS and CSS

- Functional
  - urinary continence and potency recovery

PSMs rate in pT2 tumors: RARP series

Positive surgical margins: RALP Vs RRP

Novara G, Ficarra V. et al (unpublished data)

Positive surgical margins: RALP Vs RRP

Sensitivity analysis in pT2 prostate cancers

Novara G, Ficarra V. et al (unpublished data)

Positive surgical margins: RALP Vs LRP

Novara G, Ficarra V. et al (unpublished data)

Oncological Results: 5-year bDFS


95% 91% 86% 81%


95% 91% 86% 81%
**Oncological Results: bDFS**

20,166 patients having surgery in 15 Centers

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Sooriakumaran P. et al J Urol 2011; 165: 4 (suppl 1); e 263

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20,166 patients with low risk cancer

Adjusted HR for RARP: 0.77; p = 0.262

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7,543 patients with low risk cancer

Adjusted HR for RARP: 0.77; p = 0.262

Adjusted HR for RALP: 0.64; p = 0.001

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7,387 patients with intermediate risk cancer

Adjusted HR for RALP: 0.64; p = 0.001

Adjusted HR for RALP: 0.68; p = 0.004

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2,969 patients with high risk cancer

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Outcomes evaluated

- Perioperative - operative time, blood loss, transfusion rate, overall complication rates

- Oncological - positive surgical margins, bDFS, OS and CSS

- Functional - urinary continence and potency recovery

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**Urinary continence recovery: non comparative RALP series**


12-mo continence rate

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**Potency recovery: non comparative RALP series**

Potency recovery: RARP Vs RRP

Novara G, Ficarra V. et al (unpublished data)

Potency recovery: RARP Vs LRP

Novara G, Ficarra V. et al (unpublished data)

Functional Outcomes: limitations

- Major methodological and surgical issues may affect continence rate (definition, use of questionnaires, time of assessment, surgical details)
- Most of the available studies do not report erectile function recovery in the appropriate way

Potential disadvantages of minimally invasive radical prostatectomy: Costs

| Variables                        | RRP   | LR P | M
|----------------------------------|-------|------|---
| Dorsal leaf, inferior vena cava  | 6522  | 6200 | 6099
| Radical prostatectomy cost (S3)  | 3340  | 3000 | 2735
| Additional cost, hormone (USD)   | 419   | 370  | 370
| Medicare, Medicare (USD)         | 2070  | 1001 | 1001
| Hospital stay, Medicare (USD)    | 205   | 103  | 103
| Mean stay, Medicare              | 329   | 197  | 197
| Mean PSA                          | 9.1   | 0.5  | 0.5
| T2/T3 positive margin rate (%)   | 7.8   | 27.3 | 27.3
| Rate of biochemical free recurrence (%) (4 yrs) | 96 | 96 | 96 | 96%
| 200 patients (97%) had good erections (IIEF > 20) + PDE5 inhibitor post operatively | |
| There were 2 cases of incontinence requiring an AUS and one male sling (1.27%). |

Guy’s Younger Pts < 55 years

- 236 cases
- Mean age 51 years (range 45-55 years)
- Mean PSA 9.1 (0.5-46.0)
- T2/T3 positive margin rate of 7.8%/ 27.3%
- Rate of biochemical free recurrence 96% (4 yrs)
- 200 patients (93%) had good erections (IIEF >20) + PDE5 inhibitor post operatively
- There were 2 cases of incontinence requiring an AUS and one male sling (1.27%).

What can Robotics Offer us?

- Case volume is Key
- The robot is here to stay
- MIS:
  - Less blood loss/transfusion
  - Less pain
  - Faster return to work
  - At least as good oncological results
  - Better functional results
- Choose your surgeon wisely

Is robotics the future?

- Robotics in urology has raised the bar
- Patients demand it
- High volume results excellent
- Can we afford it?
- Can we afford not to?