Pioneering Robotic-Assisted Laparoscopic Prostatectomy in The Pretoria Urology Hospital and the South African urological environment:

Dr. Lance Coetzee

Pretoria Urology Hospital
SOUTH AFRICA
Selection of candidates:

- Minimum of 15 cases in preceding 6 months
- Simulator exercises (#35) – 90% score in each
- 4-day orientation in wet lab and live dissection
  - Alst/Belgium – Mottrie
  - Istanbul/Turkey – Kural
- Case supervision with a proctor for the first 10 cases (or more).
- 3 Proctored cases within 30 days of completing da Vinci training – otherwise continue proctoring at surgeons expense
- Submission of supporting documentation
- Careful case selection until comfortable
Establishing da Vinci steering committee

- Determining the physician credentialling

- Monitoring:
  - Case numbers
  - Progression through the learning curve
  - Outcomes/complication rates
Da Vinci marketing strategy

Numbers important – keep the momentum going

- Media marketing team
- Patient education talks
- Funders on board – Keep da Vinci surgery competitive
- Establish Pretoria Urology Hospital as a center of excellence for training.
Funding of the individual training program per surgeon:

- Private Hospital group vs. Independent surgeon who may be just below the minimum requirement for training

- If the surgeon meets the minimum no. cases of 15/yr. training gets refunded
Console times - all surgeons
n=180
In this single-surgeon analysis, **RARP had a relatively long learning curve with inferior outcomes initially but then progressively superior sexual, early urinary, and pT2 PSM outcomes**.

Rafael F. Coelho a,b,c, Kenneth J. Palmer a,b, Bernardo Rocco a,b,d, Ravendra R. Moniz e, Sanket Chauhan a,b, Marcelo A. Orvieto a,b, Geoff Coughlin a,b, Vipul R. Patel a,b,*

χ² (for linear for trend), p = 0.0034
The Learning Curve Of A Complex Procedure is “S” Shaped
The Learning Curve In Open Surgery

- 5-year probability of freedom from BCR (%) vs. Surgeon experience (number of prior surgeries)
Pentafecta: A New Concept for Reporting Outcomes of Robot-Assisted Laparoscopic Radical Prostatectomy

Vipul R. Patel a, *, Ananthakrishnan Sivaraman a, Rafael F. Coelho a,b,c, Sanket Chauhan a, Kenneth J. Palmer a, Marcelo A. Orvieto a, Ignacio Camacho a, Geoff Coughlin a, Bernardo Rocco a,d

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b Hospital Israelita ALBERT EINSTEIN, Sao Paulo, Brazil
c State of Sao Paulo Cancer Institute, University of Sao Paulo School of Medicine, Sao Paulo, Brazil
d Istituto di Urologia - Universita degli studi di Milano, Ospedale Policlinico-Fondazione Ca’Granda

Complications
Positive Margin Rate
Trifecta
Cancer Control
Continence
Potency
## Oncological outcomes

**PSM**

<table>
<thead>
<tr>
<th></th>
<th>AUA</th>
<th>LRP</th>
<th>RRP</th>
<th>RALP</th>
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<tr>
<td>Cumulative analysis (WMD)</td>
<td>n.s.</td>
<td></td>
<td></td>
<td>RR 1.58 p&lt;0.00001</td>
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<td>Sensitivity analysis (WMD)</td>
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<td>RR 1.90 p=0.003</td>
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<table>
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<tr>
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<th>LRP</th>
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<th>RALP</th>
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<tbody>
<tr>
<td>Weighted means pT2/pT3</td>
<td>12.4%/39.2%</td>
<td>16.8%/42%</td>
<td>9.6%/37.1%</td>
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<table>
<thead>
<tr>
<th>Authors</th>
<th>Year of Publication</th>
<th>Patients (N)</th>
<th>Pathologic staging</th>
<th>Positive surgical margins</th>
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<tr>
<td></td>
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<td>pT2 (%)</td>
<td>pT3 (%)</td>
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<td>2006</td>
<td>325</td>
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<td>Zorn</td>
<td>2007</td>
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<td>-</td>
</tr>
<tr>
<td>Borin</td>
<td>2007</td>
<td>400</td>
<td>73.5</td>
<td>26.5</td>
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<tr>
<td>Tewari</td>
<td>2008</td>
<td>700</td>
<td>83.5</td>
<td>13.6</td>
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<tr>
<td>Ham</td>
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<tr>
<td>Weighted means</td>
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<td></td>
<td>78.7</td>
<td>20.5</td>
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PSM pT2 9.6%
PSM 13.6% overall

<table>
<thead>
<tr>
<th>Authors</th>
<th>year</th>
<th>Patients (N)</th>
<th>Median/ Mean Age</th>
<th>Follow-up (months)</th>
<th>Immediate</th>
<th>1 month</th>
<th>3 month</th>
<th>5 month</th>
<th>12 month</th>
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<tr>
<td>Joseph [15]</td>
<td>2006</td>
<td>325</td>
<td>60</td>
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<td>24%</td>
<td>56%</td>
<td>93%</td>
<td>96%</td>
<td>-</td>
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<tr>
<td>Mcnon [39]</td>
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<td>1142</td>
<td>60.2</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>92.00%</td>
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<td>184</td>
<td>62</td>
<td>6</td>
<td>43%</td>
<td>-</td>
<td>95%</td>
<td>-</td>
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<tr>
<td>Borin [20]</td>
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<td>400</td>
<td>61.2</td>
<td>6</td>
<td>76.5%</td>
<td>88%</td>
<td>97%</td>
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<tr>
<td>Zom [40]</td>
<td>2007</td>
<td>300</td>
<td>59.4</td>
<td>24</td>
<td>79.00%</td>
<td>47.00%</td>
<td>66.00%</td>
<td>50.00%</td>
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<td>500</td>
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<td>-</td>
<td>89%</td>
<td>95%</td>
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<td>214 (NR)</td>
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<td>Tewari [35]</td>
<td>2008</td>
<td>304 (AR)</td>
<td>62.8</td>
<td>13</td>
<td>27%</td>
<td>59%</td>
<td>76.0%</td>
<td>85.0%</td>
<td>91.2%</td>
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<tr>
<td></td>
<td></td>
<td>182 (TR)</td>
<td>61.2</td>
<td>6</td>
<td>38.4%</td>
<td>83.6%</td>
<td>91.3%</td>
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<td>Murphy [27]</td>
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<td>306</td>
<td>60.2</td>
<td>&gt;18</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>91.40%</td>
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<td>Krambeck [26]</td>
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<td>204</td>
<td>61</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>91.8%</td>
</tr>
<tr>
<td>Rocco [28]</td>
<td>2009</td>
<td>120</td>
<td>63</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>70%</td>
<td>93%</td>
<td>97%</td>
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<tr>
<td>Van der Poel [41]</td>
<td>2009</td>
<td>121</td>
<td>63</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>70% (any loss of urine)</td>
</tr>
</tbody>
</table>

**Weighted Means**

- 25.7% @ 1 month
- 53.2% @ 3 months
- 78.6% @ 12 months
Urinary Continence vs. time: (<1 pad/day) – (n=520)

![Bar chart showing urinary continence over time (3, 6, 9, 12 months). The percentages are 54%, 88%, 96%, and 99% respectively.](chart)
### Functional outcome
#### 12 months Erectile function

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<td>Cumulative analysis (WMD)</td>
<td>NA*</td>
<td></td>
<td>NA*</td>
</tr>
<tr>
<td>Sensitivity analysis (WMD)</td>
<td>NA *</td>
<td></td>
<td>NA *</td>
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<td>Weighted means (bil NS)</td>
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<td>60.6%</td>
<td>93.5%</td>
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*for the available comparative studies, the data using validated questionnaires are limited*
Trifecta Outcomes
Select Population: SHIM >21, Full Nerve Sparing

Continence, potency and oncological outcomes after robotic-assisted radical prostatectomy: early trifecta results of a high-volume surgeon

*Global Robotics Institute, Florida Hospital Celebration Health, University of Central Florida School of Medicine, Celebration, FL, USA, **Unidade de Urologia, Hospital das Clínicas, Faculdade de Medicina da Universidade de São Paulo, São Paulo, Brazil, and **Divisione di Urologia, Istituto Europeo di Oncologia, Milano, Italy
Potency data:

Prof. J Kelly et al UCH London:
- 25% bilateral nerve sparing – 75% Potency @ 12 months
- 40% Unilateral – 45% Potency @ 12 months
- 35% Non nerve sparing – Council for vaurect/injection therapy pre-operatively

Our series:
- 68% bilateral nerve sparing- 78% @ 9 months
- 20% Unilateral nerve sparing – 40% @ 12 months
- 12% Non nerve sparing
Potency vs. Time following RARP:

<table>
<thead>
<tr>
<th>Months</th>
<th>Potency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>38%</td>
</tr>
<tr>
<td>6</td>
<td>69%</td>
</tr>
<tr>
<td>9</td>
<td>78%</td>
</tr>
<tr>
<td>12</td>
<td>78%</td>
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IIEF >= 18 (n=134)
Institutional guidelines for salvage Robotic Radical Prostatectomy (following Brachitherapy/external beam radiation):

- Patient selection
  - No sandwich therapy
  - Appropriate Gleason grade/stage prior to initial Rx.
- Minimum of 100-120 cases successfully completed (Personal communication Patel, Annerstedt, Murphy)
- Console times consistently below 2.5hrs
- Cancer and functional outcomes in line with international standards
- Proctoring with experienced surgeon
Problems after signing off surgeons:

- Minimum case load 15/yr. (Renown medical center Reno, NV – 10 cases/year)
  - How do you restrict privileges when these numbers drop off?
    - No cases for 3 months – Proctored for 2-3 cases
    - If minimum requirement is not met – mandatory review of the next 5 cases – depending on the outcome a mandate - further training at the surgeons own expense
Maintaining credentials:

- 15 cases per year
  - Problem is policing this. Hospital groups are becoming aware that they are vulnerable. By issuing the guidelines If the surgeon acts outside of the guidelines he takes responsibility

- No cases for 3 months – proctor present
- No cases for 6 months - Proctored for 3-5 cases at the discretion of the proctor

  - OR

- Console times regularly over 2,5 hours? Complication rates start increasing
Conclusions

- Safe introduction of robotic surgery to multiple surgeons
  - Excellent early cancer control
  - Relatively high proportion of intermediate & high risk cases
  - Acceptable continence and potency rates
- Outcomes comparable to other large international series
- Compared to open RP in SA; RALP shows:
  - Significantly reduced length of stay (3.2 vs 6 days) i.e. 47% shorter LOS
  - Overall complication rate (11% vs 20%)
  - Clavien–Dindo complications Grade 3 or 4
  - RALP 1.6% vs 4.8% for open RP
Conclusions

Key points in transitioning learning curve
- Adequate simulation time
- Quality of tableside assistance
- Individual surgeon case volume
- Surgeons benefit from assisting tableside

Majority of complications occur in first 30 cases

Careful selection for nerve sparing procedures
- Cancer control was first priority

Importance of good mentoring

Team approach- developed excellent teams
Robotic Partial Nephrectomy:

- Minimum 50 Robotic Radical Prostatectomies
- Proctored for minimum 3 cases
- Patient selection
- Experienced assistant
- Limited to high volume centres
- Xi vs. Si platform
Patient selection:

- Obese vs. thin patients?
- Tumor limited to 4-5cm to start until minimum 10 cases successfully completed
- CT angiogram routinely.
- Tumor position in the kidney (ant vs. Post and Hilar masses)
- Lower volumes therefore fewer surgeons through their learning curve
Indications:

- Young patients where Nerve sparing is an issue
- Women where specimen can be removed through the vagina
- Intracorporeal orthotopic bladder
- Low volume, fewer surgeons – fewer centres of excellence.
- Is the cost justifiable for an extracorporeal conduit?
Thank you