

# The Oncological Outcomes of Robotic-assisted Radical Prostatectomy in a High Volume UK institution

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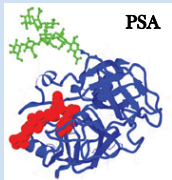
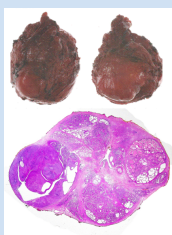
## INTRODUCTION

- Robotic-assisted laparoscopic prostatectomy (RALP) now preferred approach to radical prostatectomy (RP) in USA
- Increasing *daVinci* Surgical Systems in the UK suggests a similar trend.
- Growing number of competing treatment strategies:
  - Open, laparoscopic & robotic-assisted RP
  - Active surveillance,
  - Radiotherapy (conformal, intensity modulated, brachytherapy)
  - High intensity focussed ultrasound
  - Cryotherapy
- Aim of modern prostate cancer therapy:
  - Equal efficacy to open radical prostatectomy (i.e long term survival)
  - Positive margin rates
  - Biochemical disease free survival
  - Other definitions of stable disease for RT / HIFU etc
  - Reduced toxicity:
    - Early recovery from treatment & low complications
    - Urinary continence
    - Maintained erectile function
    - Unaltered / improved urinary function
- What is the current "standard"?
  - Largest UK series of ORP (n=1001) delivered a PMR of 52% [1].
  - Meta-analysis in the USA (n=22,164) PMR of 24% (reviewed in [1])
  - Limited large volume UK data [2].

Here we present our experience of 309 consecutive cases of RALP using the *daVinci S* Surgical System performed by a single primary surgeon in the UK. We focus on reporting the oncological results pending formal analysis of functional assessments.

### The RALP patient care pathway

- Patients discussed at multi-institutional multi-disciplinary meeting
- Suitable patients undergo pre-operative counselling, all options discussed
- Risks and benefits of robotic surgery are discussed
- Patients pre-assessed and relevant pre-operative investigations organised
- Pelvic floor exercises explained and started pre-op
- Functional assessment surveys completed (IPSS, IIEF, SF-36)
- Body mass index (BMI) / abdominal girth an important consideration
- Weight loss may be advised (ideally BMI <35 or <115KG) in order to reduce risks
- Admission on day of surgery
- General anaesthetic with transversus abdominis regional anaesthetic
- Standard *da Vinci* prostatectomy with 6 ports
- Standard antegrade nerve sparing and bladder neck sparing in suitable cases
- Enhanced recovery protocol i.e patients eat and drink normally and mobilise early
- Pelvic drain removed next morning
- Patient's expectations are geared towards discharge around 24 hours after surgery
- Urethral catheter removed 7 to 10 days post-op
- Review 4 weeks post-op
- PSA measurements 3-monthly during first year, six-monthly for the next year and then yearly



## RESULTS

**Study cohort**  
 309 Patients  
 Minimum of 6 months and mean of 14 months follow up

**Patient Demographics**  
 Ages 40-74, median 61 years  
 BMI 17 to 38 (mean 27.2) Co-morbidity present in 60.8% of patients.

**Pre-operative disease factors**  
 Presenting PSA 1.4ng/ml to 49ng/ml, mean 8.6ng/ml.  
 PSA ≥10ng/ml was present in 89/309 patients.  
 Diagnostic prostate biopsy Gleason score:

3+3=6 (n=143)	3+4=7 (n=122)
4+3=7 (n=25)	4+4=8 (n=6)
3+5=8 (n=2)	4+5=9 (n=6)
5+4=9 (n=1)	unknown = 4

Clinical stage: T1 in 234, T2 in 58, Tx = 16  
 MRI staging (215 patients): ≤T2 = 191, T3 / suspicious for T3 = 24  
 Sensitivity for pT3 - 54%, Specificity for pT2 - 80%

**Peri-operative data**  
 Previously described [3]: Median operative time = 255 mins  
 Median console time = 145 mins  
 Median fluid loss = 200ml  
 Median inpatient stay = 2 days

Complications	N
Migration of haemolock clip	12
Bladder neck stricture	6
Prolonged troublesome incontinence	3
Blood transfusion	7
Conversion to open (Cardiac event)	1
Rectal injury and diversion (now repaired)	1
Laparotomy for bleeding	1
Port site hernia	1
Pulmonary embolism	1
Prolonged drain output	2

### Histopathology

- Specimens examined by a Consultant Uro-Pathologist
- Specimens were analysed in a standardised fashion

Prostate weight 12 to 142g (mean 52g)

### Pathological details

Gleason Sum	N	Pathological stage	N
6	75	T2	252
7	212	T3a	37
8	8	T3b	16
9	11	T4	1
Unobtainable	3	Unobtainable	3

### Positive margins

Patients with organ-confined disease 44/252 (18.1%)  
 Patients with extracapsular disease 29/54 (53.7%)

### Cancer outcomes

22/309 (7.1%) patients have developed biochemical / clinical recurrence to date

3/13 patients with biopsy Gleason 8 / 9 disease have recurred

- 1 has died from metastatic disease
- 1 other has metastatic disease – on hormones
- 15 treated – hormones and salvage prostate bed radiotherapy (2 now have rising PSA)
- 3 on hormones pending salvage radiotherapy
- 2 on surveillance and considered to have residual benign prostate tissue

**Patient death from disease**  
 (pT3a, Gleason 9, positive margins, early recurrence with bone and brain metastases managed with hormones unsuccessfully)

### Influence of margin rate on biochemical failure

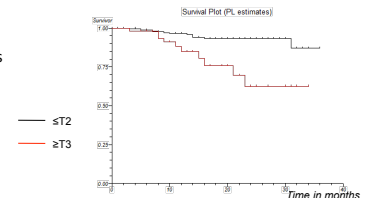
	pT2 – 3.9%	≥pT3 – 16.3%
-ve margin	7/210=3.3%	3/25=12%
+ve margin	5/42=11.9%	7/29=24.1%

### Biochemical recurrence associated with high grade disease

Gleason 6 - 1 patients, Gleason 7 - 16 patients, Gleason 8 - 2 patients, Gleason 9 - 3 patients

### Kaplan-Meier Survival Analysis

Log rank test for equivalence of death rates show poorer survival for pT3 patients  
 Chi square = 12.50 p = 0.0004



## METHODS

- Prospective clinical database maintained
- Updates through electronic medical records, GP and telephone follow-up
- All consecutive patients from the beginning of the Royal Marsden Robotic radical prostatectomy programme included from Jan 2007 to September 2009
- Cohort has a minimum of 6 months follow-up
- Data optimised by individual case review
- Missing data were completed by direct contact with the patient, GP or other specialist

## CONCLUSIONS

- Robotic radical prostatectomy delivers safe, short stay treatment with minimal morbidity
- Early oncologic outcomes are excellent with minimal biochemical failures at present
- pT3 patients appear to have higher incidence of biochemical failure as expected
- Longer follow-up required to determine long-term cure from surgery in pT3 but surgical cure appears possible in more than 50% of pT3 patients

## REFERENCES

1. Bott, S.R., et al., Radical prostatectomy: pathology findings in 1001 cases compared with other major series and over time. *BJU Int*, 2005. **95**(1): p. 34-9.
2. Mayer, E.K., et al., Robotic prostatectomy: the first UK experience. *Int J Med Robot*, 2006. **2**(4): p. 321-8.
3. Experience of Radical Robotic Prostatectomy using the DaVinci S Robot in Localised Prostate Cancer. Rashid TG, Dudderidge T, Zahur S, Kini M, Jameson C, Ogden CW BAUS annual meeting, Manchester, June 2008.