

Experience of Radical Robotic Prostatectomy using the DaVinci S Robot in Localised Prostate Cancer

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Overview

- History of Robotic-Assisted Laparoscopic Prostatectomy (RALP) in UK
- Current Literature
- Method
- Results
 - Patient demographics & Pre-operative data
 - Surgical Parameters
 - Oncological Outcomes
 - Functional Outcomes
 - Complications
- Summary of Results

History of RALP in UK

- 1st RALP performed at St Mary's Hospital in 2001 by a General Surgical Team, supervised by Anup Patel
- 1st Urological Team in UK to be recognised as competent to perform RALP by Intuitive was headed by Chris Ogden and included Omar Karim, David Hrouda and Justin Vale. It was performed at St Mary's Hospital on 22 November 2004¹ using a first generation robot.

History of RALP in UK

- Since, several centres have started their own programmes
- The 1st programme using the *Da Vinci S* Robot was started at the Royal Marsden Hospital (RMH) in 2006, led by Chris Ogden



Outcome Measure and Results for RRP

Study N (RALP)	Patient characteristics	Outcome Measure and Results for RRP							
		Functional Outcome		Surgical Parameters			Complications	Oncological Outcome	
		Urinary Function	Sexual Function	Operative Time (mean, mins)	Blood Loss (mean, mL)	Discharge ≤24h		PSA recurrence (≥ng/dL)	Positive Margin Rate
Badani et al. 2007¹ RALP earliest vs latest 200 2766	Presenting PSA 6.43 42.4% Gleason ≥7	93% ≤1 pad/day at catheter removal Median time to complete urinary control (< 1 pad/day) 3 weeks	79.2% successful sexual intercourse (SHIM Q2 ≥2) at 12 months	Surgical time 154 Console time 116	100	96.7%	24 1.5% blood transfusions	22 months, 7.3%	pT2 13.0% pT3 35.0%
Joseph et al. 2005² RALP vs LRP 50	Presenting PSA 7.3 100% Gleason 6 14% Clinical stage ≥T2a	90% continence at 3 months (no leakage, no pads/liner for security)		Surgical time 277 Console time 202	206				12%
Ball et al. 2006³ RALP vs ORP vs LRP 82	Presenting PSA 6.0 28% Gleason ≥7	At 3 months, 58% return to baseline	At 3 months, 35% return to baseline						
Tewari et al. 2005⁴ RALP vs ORP vs LRP 200	Presenting PSA 6.4 34% Gleason ≥7 Clinical stage ≥T2a 50.5%	At 44 days, 50% return of continence (using no pads/a liner for security)	50% return of erection at 6 months 50% return of intercourse at 28 months	Surgical time 160	153	93%	9	18 months, 8%	1% extensive, 5% focal

1: Evolution of robotic radical prostatectomy: assessment after 2766 procedures. Badani KK, Kaul S, Menon M. Cancer 2007 Nov 1;110(9):1951-8.

2: Robot-assisted vs pure laparoscopic radical prostatectomy: are there any differences? Joseph JV, Vicente I, Madeb R, Erturk E, Patel HR BJU Intl 2005 Jul;96(1):39-42

3: Prospective Longitudinal Comparative Study of Early Health-Related Quality-of-Life Outcomes in Patients Undergoing Surgical Treatment for Localized Prostate Cancer: A Short-Term Evaluation of Five Approaches from a Single Institution Adam J. Ball, Bethany Gambill, Michael D. Fabrizio, John W. Davis, Robert W. Given, Donald F. Lynch, Mark Shaves, Paul F. Schellhammer J Endour Oct 2006, 20(10): 723-731

4: A prospective comparison of radical retropubic and robot-assisted prostatectomy: experience in one institution A. Tewari, A. Srivasatava, M. Menon and members of the VIP Team BJU Intl. 2003 Aug;92 (3): 205-210

Published Studies from UK

Study (N, RALP)	Patient characteristics	Outcome Measure and Results for RRP						
		Functional Outcome	Surgical Parameters			Complicatio ns	Oncological Outcome	
			Operative Time (mins)	Blood Loss (mL)	Hospital Stay		PSA recurrence	Positive Margin Rate
Mayer <i>et al.</i> ¹ 2004 50	Median PSA 6.3 94% Gleason \leq 7 84% \leq T2c		Median 369.5	Median 700	Median 4 days	10 12% blood transfusion		22%

1: Robotic prostatectomy: the first UK experience. Mayer EK, Winkler MH, Aggarwal R, Karim O, Ogden C, Hrouda D, Darzi AW, Vale JA. Int J Med Robot. 2006 Dec;2(4):321-8

Our Experience

Method

- Functional questionnaires pre-operatively
SF36-v2 and UCLA Prostate Cancer Index; IIEF; IPSS
- Admission night before/morning of surgery
- Theatre staff trained in robotics
- Technique: Transperitoneal approach
Bilateral nerve-sparing
- Post-Operative Management
 - Drain removal <24 hours
 - Discharge within 24-48 hours
 - TWOC and ROC 7-10 days (Day Unit)
 - First F/U 2/52 post-op
 - PSA 3-monthly intervals
 - Functional questionnaires 3-monthly intervals

Results

Patient Demographics

- 100 consecutive cases
 - 1 surgeon, Chris Ogden

- Age (yrs)

median 61

range 40-74

- BMI

mean 28.2

range 25.1-33.2

Co-morbidities	%	Examples
None	54	
Cardiovascular/Vascular	22	CABG, MI, intermittent claudication, MIA, TIA, AVR
Endocrine	2	Diabetes
Respiratory	6	Asthma, TB
Abdominal/Surgical	12	Appendicectomy, hernia repair, ulcerative colitis, diverticular disease
Renal/ Urological	12	BNI, TURP, nephrectomy,
Psychiatric	6	Depression, chronic fatigue syndrome
Dermatological	2	Psoriasis
Warfarin	1	
Obese	2	
Multiple Morbidities	12	

Pre-operative data

- Presenting PSA (ng/mL)

mean 8.3 ± SD 4.5

range 1.7-34.0

- **29%** **PSA ≥10**
- **47%** **GI ≥7**
- **25%** **Stage ≥ T2**

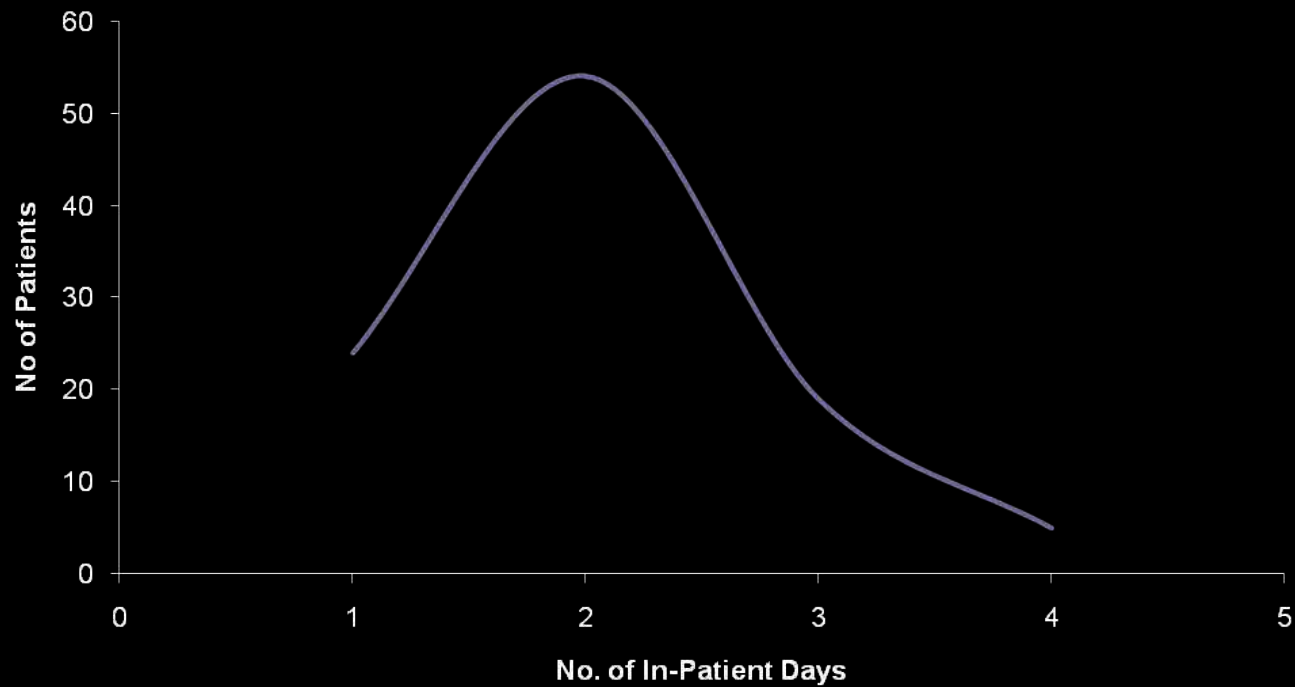
		%
Presenting PSA (ng/mL)	0-4.0	10
	4.1-10.0	58
	10.1-20.0	27
	>20.0	1
	unavailable	4
GI score (n=100)	3+3	49
	3+4	33
	3+5	2
	4+3	8
	4+4	3
	4+5	1
	other	2
	unavailable	2
Clinical Stage (n=100)	T1	52
	T2	25
	T3	0
	post-biopsy change	1
	unavailable	22

Surgical Parameters

- Operating Time Median 255 mins
Range 170 – 410 mins¹
- Console Time Median 142 mins
Range 90 – 253 mins¹
- Fluid loss Median 138mls
Range 30-500mls¹
- Catheter time not included in analysis
- In-patient stay Median 2 days
Range 1-4¹

1: Excluding one outlier (discussed)

Surgical Parameters



■ In-patient stay

Median 2 days

Range 1-4¹

Pathological data

Considerable up-staging as reported in previous studies¹

- 65% ≥ GI 7
- 78% ≥ pT2c

Stage	Grade								Total
	1+3	3+3	3+4	3+5	4+3	4+5	5+4	ductal	
pT1c		1							1
pT2a		11	5					1	17
pT2b			3						3
pT2c	1	17	33	1	4	1	1		58
>pT2c		4	8	1	3	2	1		19
unclear					1				2
Total	1	33	49	2	9	3	2	1	100

- Actual prostate wt (g) median 47.0
range 12.0-103.0

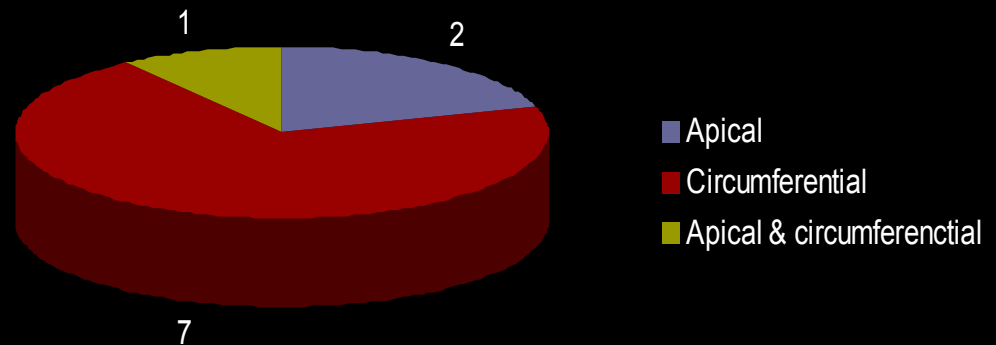
1: Significant upgrading affects a third of men diagnosed with prostate cancer: predictive nomogram and internal validation. Chun FK, Briganti A, Shariat SF, Graefen M, Montorsi F, Erbersdobler A, Steuber T, Salonia A, Currlin E, Scattoni V, Friedruch MG, Schlomm T, Haese A, Michl U, Colombo R, Henzer H, Valiquette L, Rigatti P, Roehrborn CG, Huland H, Karakiewicz PI. BJU Int. 2006 Aug;98(2):329-34

Oncological Outcome

Oncological Outcomes

- PMR (extensive/focal) 12.7% (10/79)
in organ-confined prostate cancer

- 1 pT2b G3+4
- 2 pT2c G3+3
- 7 pT2c G3+4



Oncological Outcomes

- PMR

Cases 1-25	14.3%
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Cases 75-100	5.5%
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Oncological Outcomes

PMR

\geq pT3

Stage	n	Margin positive	%
pT3a	12	5	41.7%
pT3b	6	5	83.3%
pT4	1	1	100%

Oncological Outcomes

- Undetectable PSA <0.2ng/dL
 - 78% had follow-up PSAs measured at RMH
 - Different labs have different cut-offs (<0.2, <0.1, <0.05, <0.01)
 - RMH nadir <0.04ng/dL

Months	3	6	9	12
n	80	55	34	18
% undetectable PSA	97.5% ¹	100%	100%	100%

¹2 patients required further treatment (androgen deprivation, IMRT), both G9 with extra-prostatic spread but pre-operative biopsies G7

Functional Outcome

Sexual Function

Graph demonstrating % change in total IIEF score with time
(months post-operatively)

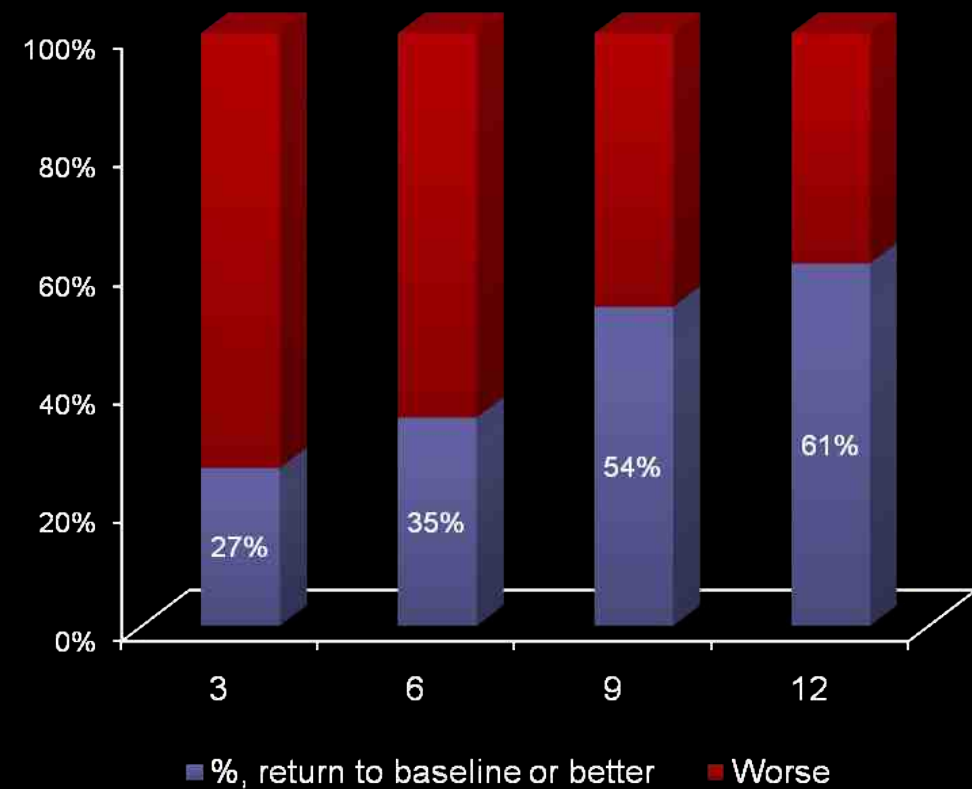
- 18-24 months to recover EF
- 53 patients had some degree of ED at baseline, i.e. IIEF score <25

Sexual Function

Total IIEF scores:
return to baseline or better (n=45)

By 3 months 27%

By 12 months 61%



Sexual Function

Graph Demonstrating % of Patients who are sexually active and potent



- At 6 months

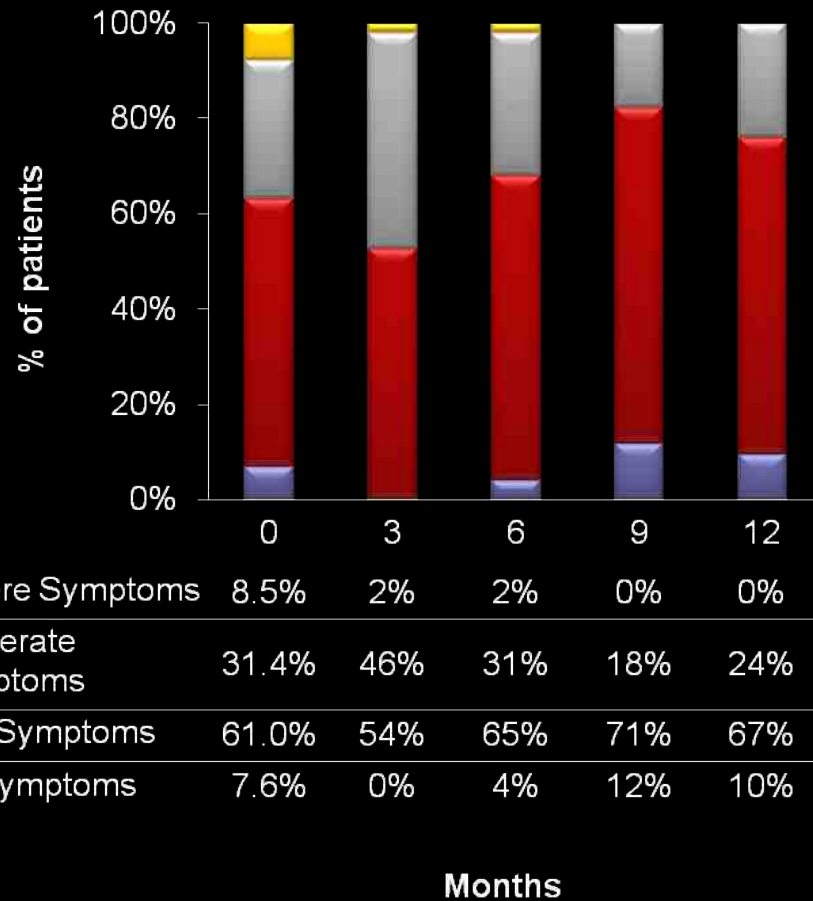
35% recovered baseline orgasmic function

50% satisfied with erectile function

- At 9 months

60% no longer "bothered" by their symptoms

Urinary Function



By 9 months (n=30) :

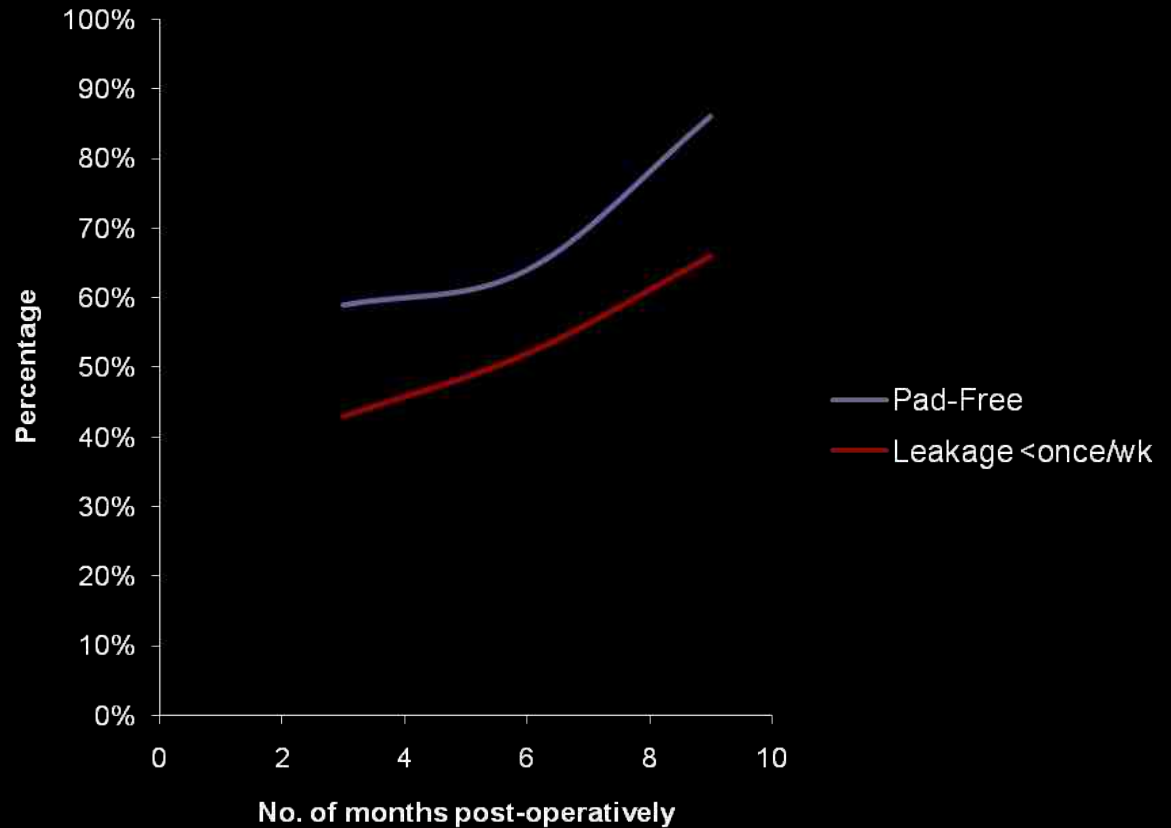
- Return to baseline or better 60%
- No longer “bothered” by symptoms 80%

Continence

- Continence defined as leakage < once/wk
no pad usage
- Pre-operatively all patients were continent
- 3 months (n=44) 59% were pad-free, 43% leaked \leq once a week
- 9 months (n=29) 86% were pad-free, 66% leaked \leq once a week
those wearing pads wore 1-2 pads/day

Continence

Graph demonstrating continence post-operatively, defined by urinary leakage and pad usage



3 months

75% (QOL, n=46)

Complications

- 1 conversion to open
 - on-table cardiac arrest*
 - complete heart block requiring pacing*
- 1 blood transfusion
 - port-site bleed*
- 3 Weck clip removals
- 1 bladder neck stricture requiring dilatation (LA)
- 0 bladder neck strictures requiring resection

Table summarising functional and oncological outcomes from this study

N (RALP)	Patient characteristics	Outcome Measure and Results for RRP							
		Functional Outcome		Surgical Parameters			Complications	Oncological Outcome	
		Urinary Function	Sexual Function	Console Time (median, mins)	Fluid Loss (mL)	Hospital Stay (days)		PSA recurrence	PMR
100	Median age 61yrs Mean BMI 28.2 65% ≥G1 7 78% >pT2c	3 months: 60% returned to baseline (symptoms) 43-59% continent	3 months: 27% return to baseline 12 months: 61% return to baseline	142	138	2	1 conversion 1 blood transfusion 3 Weck clip removal 1 dilatation	2 patients required further treatment At 12 months, 0%	12.7% (organ-confined)

Thank you
for listening

