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Robotic prostatectomy for high risk locally advanced prostate cancer: techniques and outcomes from the highest volume UK centre

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Level 1 evidence for treatment of high-risk locally-advanced prostate cancer supports ADT plus EBRT

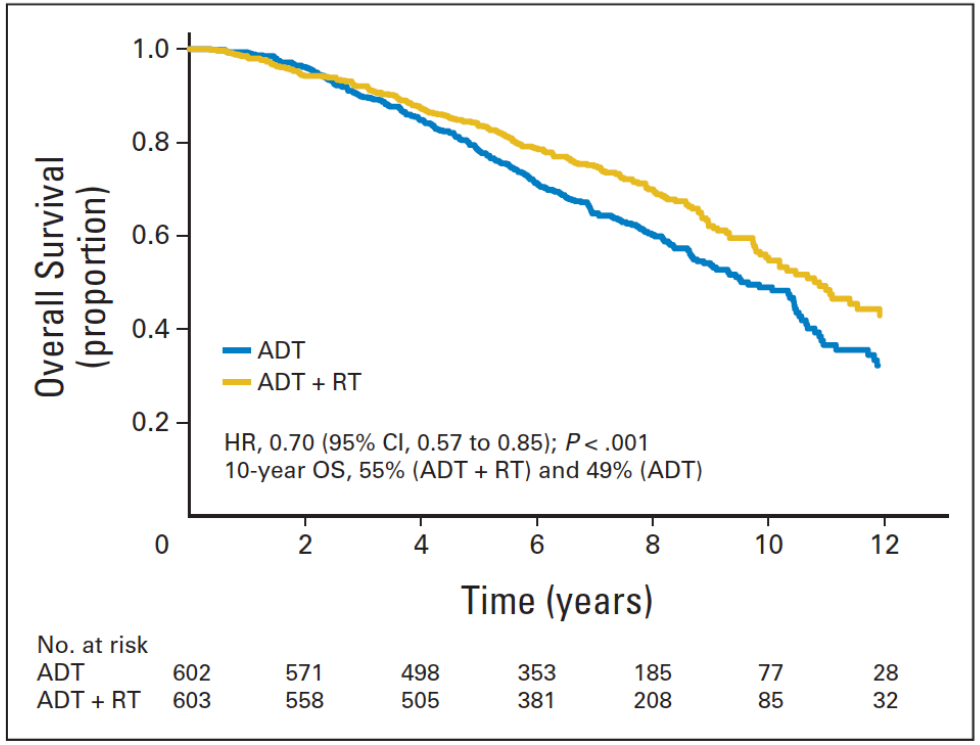


Fig 2. Overall survival (OS). ADT, androgen-deprivation therapy; HR, hazard ratio; RT, radiotherapy.

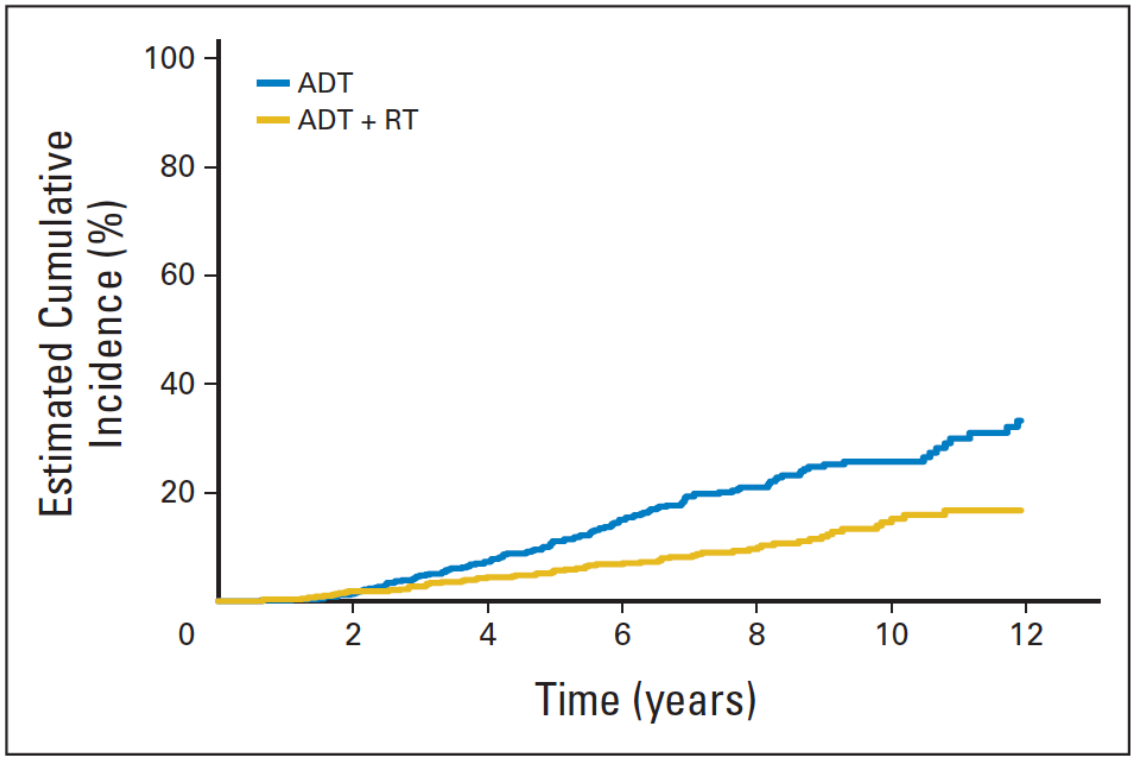
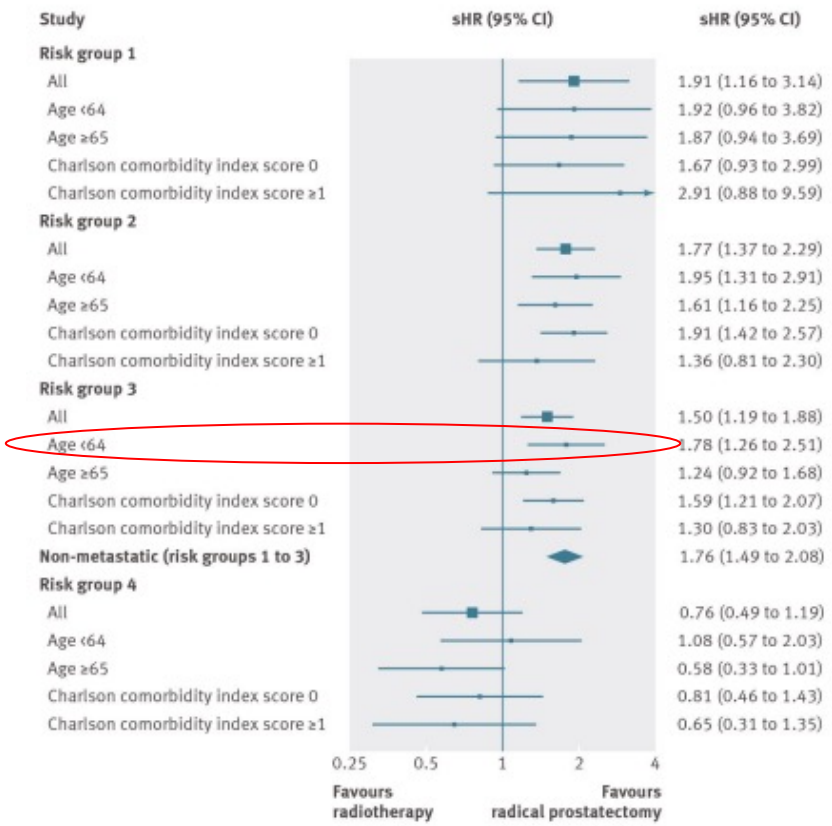


Fig 3. Deaths from prostate cancer. ADT, androgen-deprivation therapy; RT, radiotherapy.

MRC PR07 - Mason et al. JCO 2015

Observational comparative data support use of surgery in <65 years

Swedish national registry



Sooriakumaran et al, BMJ 2014

US National Cancer Database

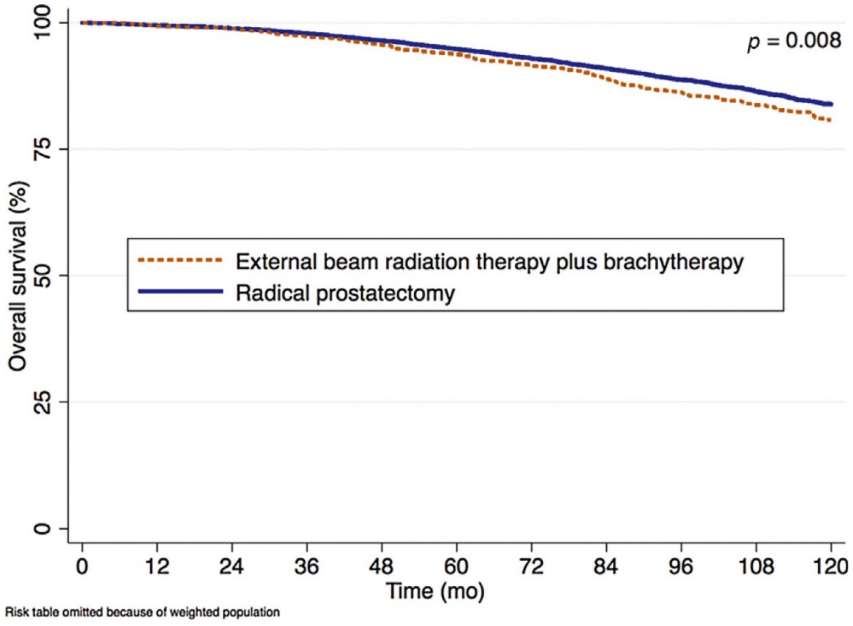


Fig. 1 – Inverse probability of treatment weighting-adjusted Kaplan-Meier analysis of overall survival after radical prostatectomy versus external beam radiation therapy plus brachytherapy.

Berg et al, Eur Urol 2019

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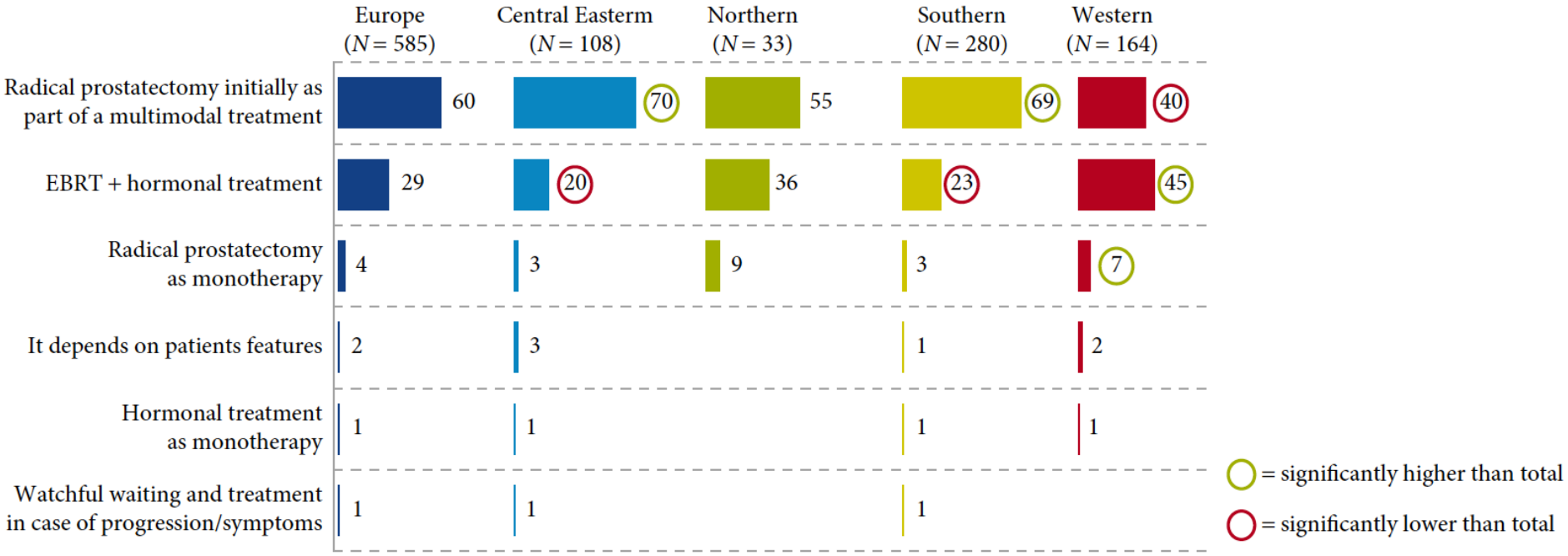
Surgery is preferred by many European experts for high-risk prostate cancer

Fig. 2 Preferences for initial management of high-risk prostate cancer. Numbers are proportions of respondents per geographical area. Total refers to the entire European sample ($N = 585$). EBRT, external beam radiation therapy.



Surcel et al. BJUI 2014

Surgery is safe and has excellent outcomes for high-risk prostate cancer

UK National Audit (BAUS)

	N	%
Surgical treatment modality		
Open	471	14.7
Laparoscopic	770	24.1
Robotically assisted	1,940	60.7
Missing	15	0.5
Total	3,196	100.0
Minimally invasive procedure converted to open operation		
Yes	14	0.4
No	2,570	80.4
Missing	612	19.1
Total	3,196	100.0
Nerve Sparing		
Bilateral	466	14.6
Unilateral	808	25.3
None	1,805	56.5
Missing	117	3.7
Total	3,196	100.0
Reported lymph node dissection status		
Extended	1,161	36.3
Obturator fossae	884	27.7
None	1,046	32.7
Missing	105	3.3
Total	3,196	100.0
Rectal injury		
Yes	17	0.5
No	3,179	99.5
Total	3,196	100.0
Blood transfusion rates (units)		
Minor (<3 units)	19	0.6
Moderate (3-6 units)	9	0.3
None	2,996	93.7
Missing	172	5.4
Total	3,196	100.0
Clavien complications		
Grade I	188	5.9
Grade II	89	2.8
Grade IIIa	27	0.8
Grade IIIb	32	1.0
Grade IVa	4	0.1
Grade V	2	0.1
None	2,848	89.1
Missing	6	0.2
Total	3,196	100.0

Lymph node invasion rate		
Positive	286	8.9
Negative	1,513	47.3
No dissection done	1,151	36.0
Missing	246	7.7
Total	3,196	100.0
T2 - Surgical margin rate		
Positive margins <3 mm length	71	7.4
Positive margins ≥3 mm length	20	2.1
Positive margins length unknown	40	4.2
Negative	806	83.9
Missing	24	2.5
Total	961	100.0
T3/4 - Surgical margin rate		
Positive margins <3 mm length	338	17.1
Positive margins ≥3 mm length	191	9.5
Positive margins length unknown	302	15.0
Negative	1,099	55.8
Missing	56	2.6
Total	1,986	100.0
Surgeon Volume		
1-50 surgeries per year	110	68.3
51-100 surgeries per year	39	24.2
>100 surgeries per year	12	7.5
Total	161	100.0

Aning et al, BJUI 2019

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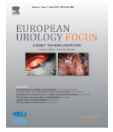
Surgery requires honest patient counselling

EUROPEAN UROLOGY FOCUS 4 (2018) 351–359

available at www.sciencedirect.com
journal homepage: www.europeanurology.com/eufocus



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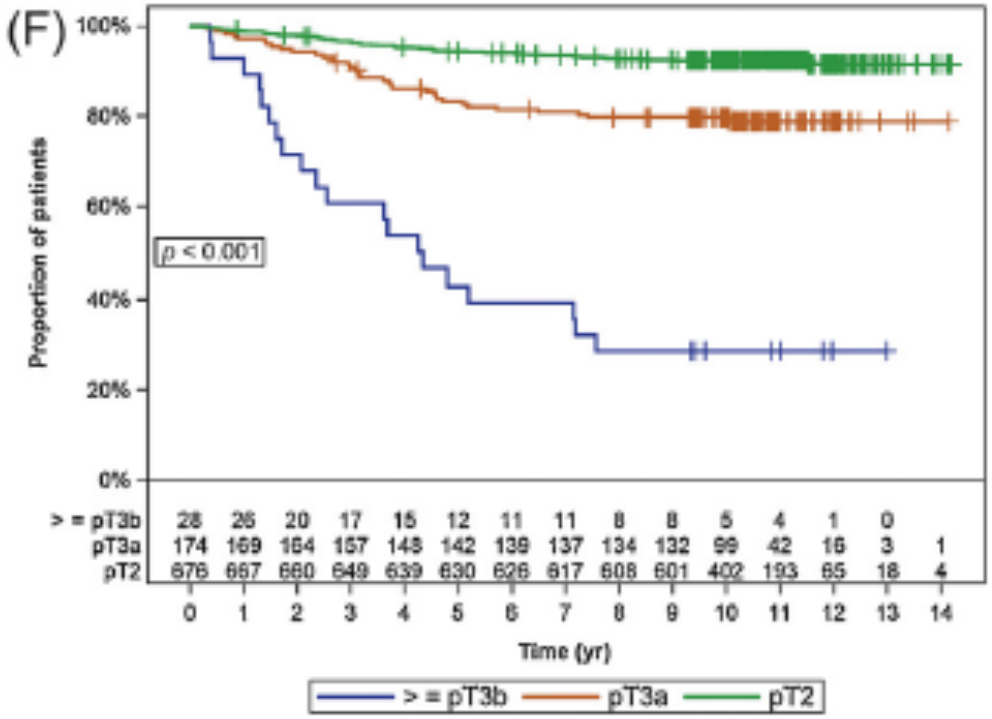
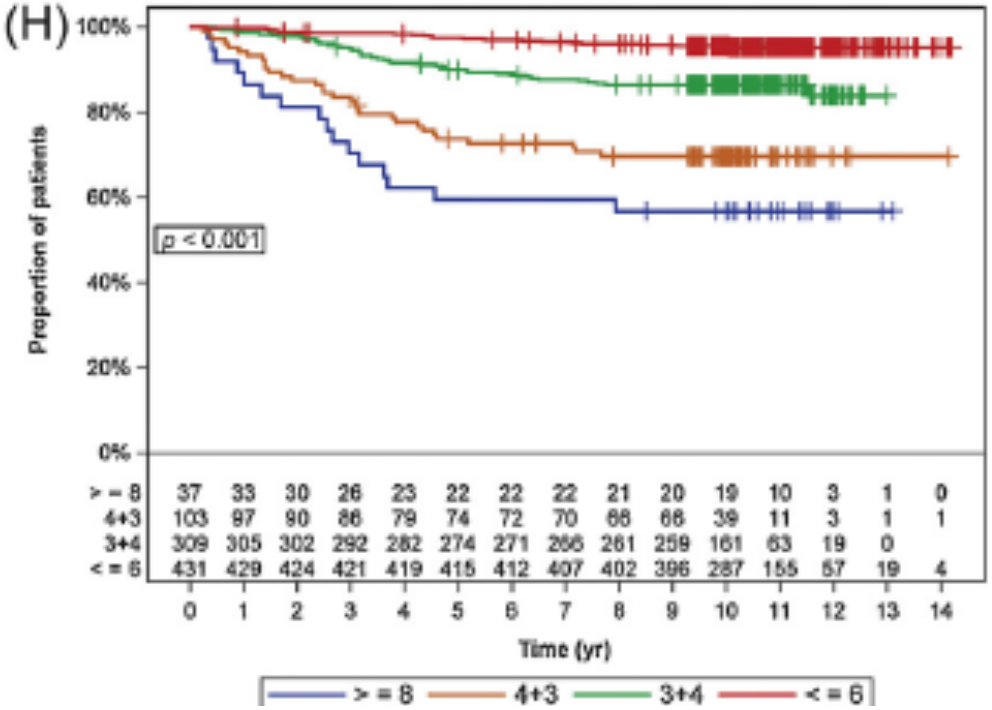
Prostate Cancer

Oncologic Outcomes After Robot-assisted Radical Prostatectomy: A Large European Single-centre Cohort with Median 10-Year Follow-up

Prabhakar Rajan[a,b,c,], Anna Hagman[a], Prasanna Sooriakumaran[a,d,e], Tommy Nyberg[f,g], Anna Wallerstedt[a], Christofer Adding[a], Olof Akre[a,h], Stefan Carlsson[a,f], Abolfazl Hosseini[a], Mats Olsson[a], Lars Egevad[i], Fredrik Wiklund[j], Gunnar Steineck[g], N. Peter Wiklund[a,f,*]*

Controveries:
? Role of ePLND
? Role of PSMA PET





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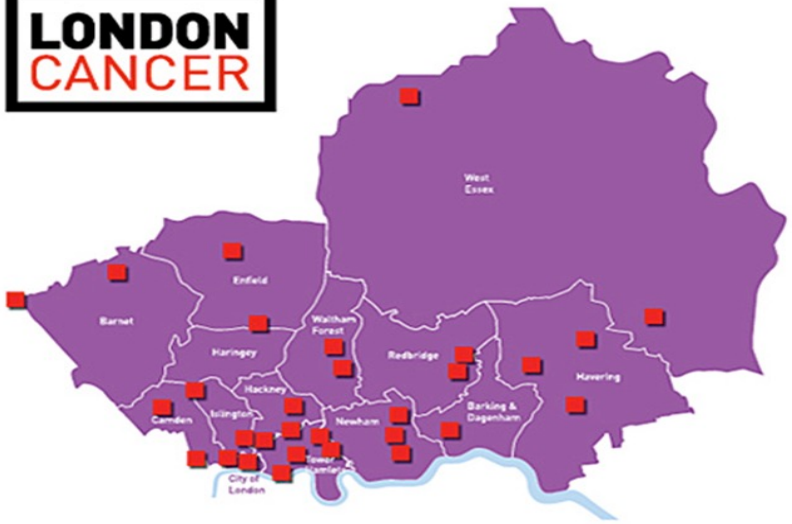
UCLH RARP programme

LONDON CANCER



Population-based programme - 4.5 Million

Excellent care through partnership

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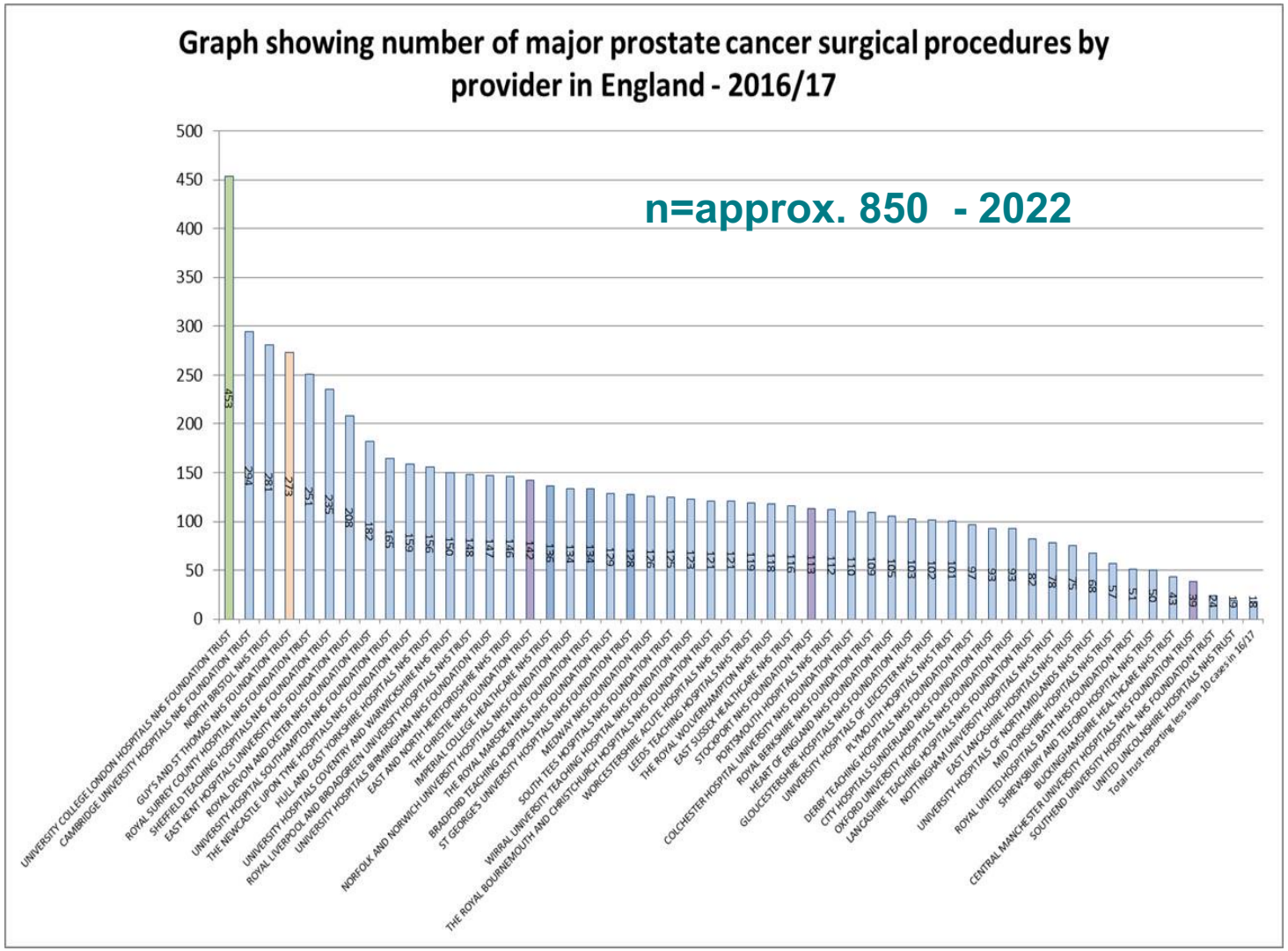

UCLH multi-disciplinary team

Consultant Urological Surgeons
John Kelly
Senthil Nathan
Greg Shaw
Prabhakar Rajan
Anand Kelkar
Prasanna Sooriakumaran
Ashwin Sridhar
Justin Collins
Zafer Tandogdu
Chris Ogden
Prashant Patel
Veeru Kasiviswanathan
Nicolo deLuyk
Ahmed Naser

Robotics Surgical Care Practitioners
Aloiza Pesigan
Pamela Nwangu

Senior Robotic Fellows
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Osama Al-Bermani (Australia)
Jeffrey Leow (Singapore)
Aditya Parikh (India)
Wilson To (UK)
Eoin Dineen (UK)
Ameet Gupta (UK)
David Wetherill (Australia)
Matt Parry (UK)

Clinical Nurse Specialists
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Richard Weston (Senior CNS)
Karen Wilkinson (Senior CNS)
Nora Umali (CNS)
Jackie Bernand (CNS)
Fernando Garcia (CNS)

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Alice Hancock (General Manager)
Jessica Fisk (Assistant General Manager)
Varsha Maisura (Team Leader)

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Miles Walkden (Consultant Radiologist)
Doug Pendse (Consultant Radiologist)
Louise Dickinson (Consultant Radiologist)

Department of Histopathology
Alex Freeman (Consultant Pathologist)
Myrna Wozaltacyk (Consultant Pathologist)
Rhys Ball (Consultant Pathologist)
Aiman Haider (Consultant Pathologist)

Early outcomes of RARP for high risk prostate cancer: the UCLH experience

Total patients from Jan 2018 to Jul 2023
= n=3,637

"STAMPEDE high-risk" any 2 of-

- cT3 to cT4
- Biopsy Gleason Score 8 to 10
- Prostate Specific Antigen ≥40 ng/mL

Total high risk cohort n=193 patients

Pre-operative characteristics

Mean Age (S.D.)	64.4 years (6.7)
Mean BMI (S.D.)	28.0 kg/m2 (4.4)
Mean PSA	10.87 ng/ml (12.94)
Median PSA (IQR)	7.45 ng/ml (5.57 to 10.4)
Gleason Score	**n= (%)**
7	6 (3.1%)
8	124 (64.3%)
9	63 (32.6%)
cT-stage	**n= (%)**
</=T2	193 (100%)

Peri-operative and complications

Peri-operative characteristics

Nerve Sparing	n= (%)
Unknown	0 (0%)
None	67 (34.7%)
Unilateral	75 (38.9%)
Bilateral	51 (24.5%)
Lymph Node Dissection	n= (%)
None	109 (57.0%)
Yes	83 (43.0%)
Operative Time	n= (%)
< 2.0 hrs	31 (16.1%)
2.0 to 3.9 hrs	156 (80.8%)
> 4.0hrs	4 (2.1%)
Missing	2 (1.0%)
Length of Stay	
Mean (S.D.)	1.89 days (1.7)

Complications

Conversion to open	0 (0%)
Estimated blood loss	n= (%)
<500 mls	157 (81.3%)
500-1000 mls	31 (16.1%)
>1000 mls	3 (1.4%)
Missing	2 (1.0%)
Intraoperative Complications	
None	188 (97.4%)
Problematic bleeding	2 (1.0%)
Problematic bleeding + difficult dissection	1 (0.5%)
Rectal injury	1 (0.5%)
Vascular injury	1 (0.5%)
Postoperative Complications	
Transfusions	0 (0%)
Clavien 0 (none)	170 (88.1%)
Clavien 1	8 (4.1%)
Clavien 2	9 (4.7%)
Clavien 3	6 (3.1%)
Clavien 4 (death)	0 (0%)
Readmission	12 (6.2%)

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Pathological and early oncological outcomes

Post-operative characteristics

Gleason Score	
7	137 (71.0%)
8	15 (7.8%)
9	41 (21.2%)
pT-stage	
pT2	119 (61.7%)
pT3a	52 (26.9%)
pT3b	21 (10.9%)
Missing	1 (0.5%)
pN stage	
pN0	70 (84.3%)
pN1	13 (15.7%)
pNx	109 (100%)

Post-operative characteristics

Upstaging	pT2	pT3	Missing
cT2	119 (61.7%)	73 (37.8%)	1 (0.5%)

Margin Status	pT2	pT3
Negative	109 (92.4%)	48 (65.8%)
Positive	9 (7.6%)	17 (34.2%)

p<0.001

Margin Status	Non NS	Unilateral NS	Bilateral NS
Negative	53 (80.3%)	62 (83.8%)	42 (82.3%)
Positive	13 (19.7%)	12 (16.2%)	9 (17.7%)

p=0.87

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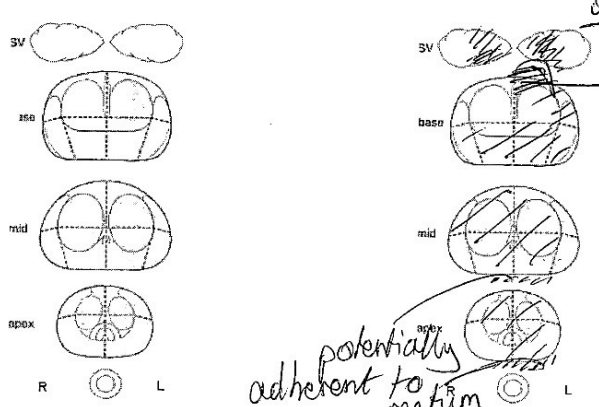
Case presentation

- 38 year old male from Ghana on no medications with BMI 24
- Presenting PSA 36 Nov 2022
- MRI (Ghana): extensive tumour T3b N0
- Transperineal biopsy: Gleason 4+5 12/14 cores
- Commenced on Bicalutamide 50mg daily
- Ga68-PSMA PET/CT: extensive prostate avidity only no evidence of metastasis
- Repeat MRI May 2023: extensive disease involving bladder neck and SVs

Surgical MRI planning

Age	38 y.o., 17/3/1985	PMH	Previous biopsy in Ghana with Gleason 4+3 in Sep 22 Needs sperm banking
Referred for	RALP		
sMDT TNM staging	T3bN0M0		
PSA	36 / 21.9	Drugs	Started on bicalutamide
PSA date	20/11/22		
Biopsy Type		Previous Abdominal surgery?	
Biopsy Date			
DRE			
Volume of prostate	**48cc**	PET	PSMA PET no mets
Pathology Summary	**G4+5 12/14 8mm**	Bone Scan	
Suitable treatment options from planning			

Biopsy **MRI** Date ~~Aug 2022~~ 13/12/22 04/5/23



protrudes into bladder neck on left <1cm

post biopsy artefact ++ but likely disease throughout prostate

potentially adherent to rectum

T stage	2	3a (macroscopic)	3b	4
Lymph node	N0	N1	M1a	

Nerve spare right	Y	DRE	N
Nerve spare left	Y	DRE	N
Retzius spare	Y		N
Bladder neck spare	Y		N

MUL	16mm
Middle lobe	disease extension ~1cm on left

Grade difficulty 1-3		Grade MRI 1-5	

Location MRI

Surgical Feedback Comments 27/10/22

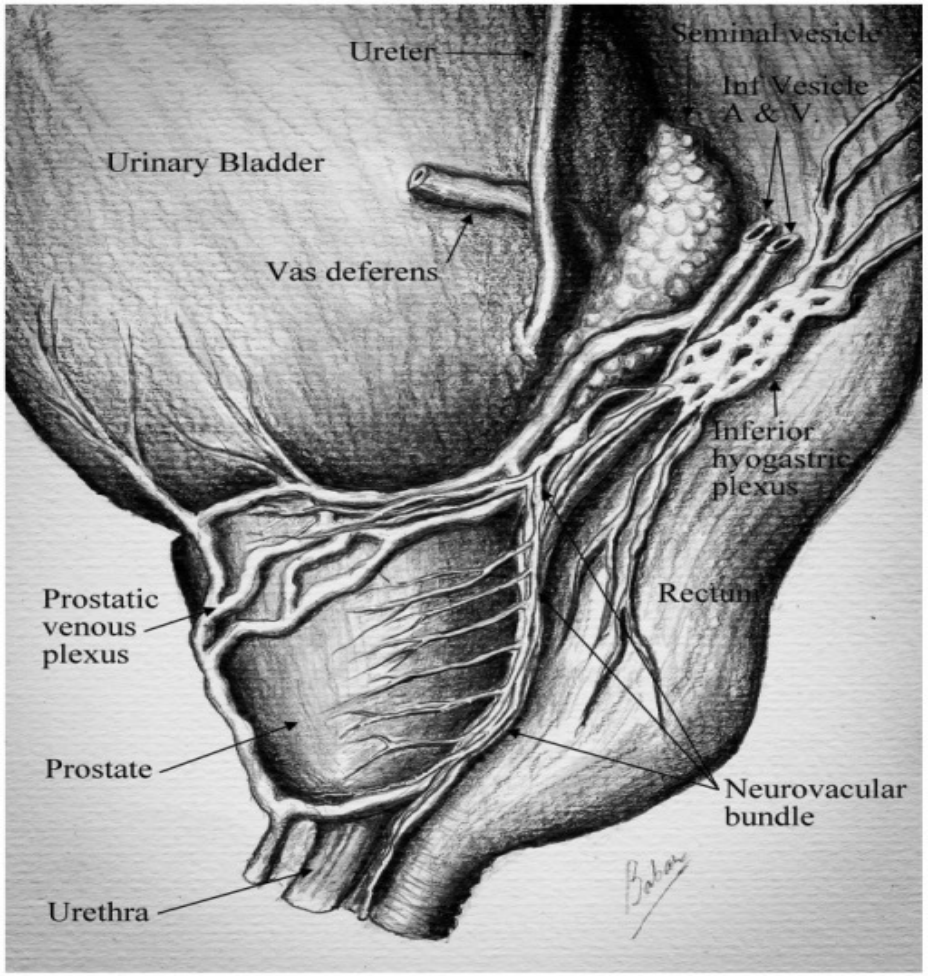
Plan: Robotic prostatectomy (wide excision) + extended pelvic lymph node dissection

Post operative pathology

- Pathology: Gleason 4+5 34.5ml tumour volume
- Bilateral 24mm extraprostatic extension + SV involvement
- 4mm basal margin, 3 mm left and <1mm right margin
- 1/17 nodes positive 1.5mm with extracapsular extension on right
- 1/7 nodes positive without extracapsular extension on left
- Peritoneal biopsy positive
- 1 month PSA 0.23; 2 month PSA 0.51
- 2 months PSMA PET: no evidence of recurrent disease
- **Tumour board discussion: ADT + enzalutamide, whole pelvis radiotherapy (Enzamet, Stampede, Latitude)**

UCLH surgical principles

- Primary aim is cancer cure
- Typically non nerve sparing but save hypogastric plexus – bowel function
- Avoid ureteric, vascular, & bowel injury
- Frozen Section – if feasible
- Avoid injury to bulbar arteries



Key steps

1. Careful MRI planning - may consider nerve-/retzius-/urethral-sparing
2. Take fat on SVs – can be done using posterior approach
3. Careful bladder neck sparing – safer to go wide & reconstruct
4. Take pedicles lateral to medial – preserve rectal arteries
5. Dissect in plane posterior to denonvilliers – take fat anterior to rectum
6. Consider ureteric stents if proximity of margin to UO's
7. Rocco can be difficult – no tissue to suture
8. Anastomosis with unidirectional barbed monofilament – strong posterior plate
9. Roberts' catheter if bladder neck reconstruction
10. Anterior reconstruction
11. Consider anastomotic & rectal leak tests

Conclusions

- Level 1 evidence for treatment of high-risk locally-advanced prostate cancer is ADT + EBRT (+/- ARTA) and **NOT** surgery
- However, observational data have shown a benefit for surgery in <65 years
- Definitive RCTs will not report for years (e.g. SPCG-15 CI: Prof Olof Akre)
- National audit data demonstrate that surgery is safe and has excellent outcomes (in some favourable patients)
- Transparent patient counselling for risk of failure of monotherapy and toxicity of salvage treatment (EBRT)

Acknowledgements

LONDON CANCER
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THE LONDON CLINIC

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