JCU

Journal of Clinical Urology
2017, Vol. 10(4) 323–331

DOI: 10.1177/2051415816682423
journals.sagepub.com/home/uro
SAGE

BAUS section of Oncology Meeting selected abstracts

15–16 November 2016, Wales Millennium Centre, Cardiff, Wales

Paper abstracts

1 The outcomes from early re-resection in patients with high-risk non-muscle invasive bladder cancer

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Introduction: Around one third of bladder cancers are high-grade non-muscle invasive tumours. Current guidelines advocate early re-resection in patients with this cancer. However, the benefits of re-resection are unclear and its uniform need has been questioned. Here we compare the outcomes in patients with and without re-resection using a large single-centre cohort.
Materials and methods: We identified all patients with new high-grade non-muscle invasive bladder cancer treated between 1994 and 2009 in Sheffield. We annotated these with hospital, pharmacy and cancer registry records. Primary outcomes were disease-specific and overall survival. Secondary outcomes were the findings at re-resection, rates of progression to muscle invasion and radical treatment. Statistical tests were two-tailed and significance was defined as $P<0.05$.
Results: We identified 932 eligible patients, including 229 (24.5%) who underwent re-resection within 12 weeks and 234 (25.0%) 3–6 months after diagnosis. Patients with and without re-resection were similar for clinico-pathological criteria. During follow-up, patients with re-resection were more frequently diagnosed with muscle invasion (126 (27.2%) vs. 49 (10.5%), χ^2 $P<0.001$) and more commonly underwent radical treatment (127 (27.4) vs. 35 (7.5%), $P<0.001$) than those without re-resection. In total, 528 (56.7%) patients died during follow-up. Patients with re-resection had a significantly higher disease-specific (179 (79.6%) vs. 518 (76.3%), log rank $P=0.05$) and overall survival (119 (53.1%) vs. 251 (37.2%), log rank $P<0.001$) when compared to those without re-resection.
Conclusion: We found that patients undergoing early re-resection were more likely to be diagnosed with muscle invasion, more likely to undergo radical treatment and had a higher disease-specific and overall survival.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

2 The BAUS Radical Prostatectomy Audit 2014: an update on current practice, and an analysis of trends between centres and surgeons performing differing volumes of surgery

C Miller, A McNeill, N Campain, L Hounsome, S Fowler and J S McGrath
Royal Devon and Exeter Hospital, UK

Introduction: Data collected as part of the BAUS prostatectomy audit describes current practice across England in 2014.
Patients and methods: A total of 6651 radical prostatectomies, performed by 157 consultants over 71 sites, were uploaded to the BAUS audit and data platform. Centres and surgeons were grouped by volume of procedures performed (centres: low-volume <50 cases; medium-volume 50–100 cases; high-volume >100 cases; surgeons: low-volume <50 cases; high-volume >50 cases), allowing comparison and evaluation of the effect of centralisation.
Result: The median number of radical prostatectomies performed was 31/surgeon and 77/centre. High-volume surgeons/centres performed 59.8% and 58.5% of radical prostatectomies. The effect of surgical approach is shown in Table 2.1 and the effect of volume is shown in Table 2.2.

Table 2.1.

	RALP	LRP	ORP
% Procedures	59%	27%	13%
Length of stay	1 day	2 days	3 days

Only high-volume RALP had the lowest length of stay of 1 day.
RALP: robotic-assisted laparoscopic prostatectomy; LRP: laparoscopic radical prostatectomy; ORP: open radical prostatectomy.

Table 2.2.

	Centres			Surgeons	
	Low-volume	Medium-volume	High-volume	Low-volume	High-volume
Nerve-sparing	49.6%	53.5%	45.7%	44.8%	50.8%
LND	41.8%	31.2%	41.6%	36.5%	40.2%
Extended LND	14.3%	6.2%	23.3%	10.9%	21.7%
pT2 positive surgical margins	18.0%	19.9%	13.9%	19.6%	14.2%
Transfusion rate	2.3%	2.2%	3.0%	2.4%	2.9%
Commonest surgical approach	LRP	RALP	RALP	RALP	RALP

LND: lymph node dissection; LRP: laparoscopic radical prostatectomy; RALP: robotic-assisted laparoscopic prostatectomy.

Conclusion: The majority of procedures were performed by high-volume centres and surgeons. Minimally invasive approaches are more common, bringing advantages of lower length of stay and transfusion rates. Nerve-sparing procedures are performed in 45–54% of cases, the effect of centre and surgeon volume is variable. High-volume centres and surgeons are more likely to perform a robotic-assisted laparoscopic prostatectomy, lymph node dissection and extended lymph node dissection, having lower positive surgical margin rates, and lower length of stay.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

3 Factors influencing the length of hospital stay after robotic radical cystectomy: a multidisciplinary enhanced recovery challenge

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Introduction: Radical cystectomy, the treatment of choice for muscle invasive disease, carries a particularly high risk of morbidity and mortality, as well as long hospital stay and readmissions. Our aim was to evaluate the impact of perioperative factors on length of stay and long-term oncological outcomes.
Patients and methods: Since April 2013, 138 (111 male and 27 female) patients underwent robotic-assisted radical cystectomy. Patients were classified in two groups, 84 that had a length of stay of median (61%) or less and 54 (39%) over 5 days.
Results: Median length of stay was 5 days (range 3–28 days) and readmission rate was 15.2%. Only female gender, older age, and major (Clavien grade 3 or greater) complication were associated with a prolonged length of stay whereas preoperative cardiopulmonary exercise testing measures, ASA score and neoadjuvant chemotherapy did not affect hospital stay. Ninety-day readmission rates were similar among the two groups (P=0.28). No difference was seen in oncological outcomes between the two groups while a worse CSM-free survival rate was noted for longer hospital stay (96% vs. 87%).
Conclusions: A comprehensive high volume bladder cancer centre, combining minimally invasive surgery with a multimodal enhanced recovery programme, confers optimal oncological outcomes reducing hospital stay compared to national standards without an increase in complications or readmission rates. Both female and

elderly patients should receive preoperative counselling about their increased risk of longer hospital stay and closer perioperative monitoring. Furthermore, patients staying longer in hospital are at higher risk of cancer-specific mortality and might warrant proactive interventions.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

4 Long-term oncological outcomes and toxicity in 598 men 60 years of age at time of low dose rate brachytherapy for localised prostate cancer

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Introduction: Prostate cancer in young men under 60 years of age is often treated by radical prostatectomy. We report oncological and functional outcomes of such men treated with low-dose rate brachytherapy.
Methods: Of 3315 patients treated with low-dose rate brachytherapy at our centre, we included in the analysis patients ⩽60 years at time of treatment with at least 3 years post-implant follow-up, a pre-treatment and three follow-up prostate-specific antigen measurements. Prospectively collected physician reported adverse events and patient reported symptom scores were analysed.
Results: The median age was 57 years, median follow-up 8.6 years (range 1.5–17.3) and median prostate-specific antigen follow-up 5.8 years. Low, intermediate and high-risk disease represented 53%, 37% and 10% of cases. Overall and prostate cancer-specific survival 10 years post-implant were 97% and 99% for low-risk, 98% and 100% for intermediate and 98% and 100% for high-risk disease, respectively. Relapse-free survival using the nadir+2 definition was 95%, 92% and 90% for low, intermediate and high-risk disease, respectively, 10 years post-implant. Urinary stricture and rectal haemorrhage were the most common genitourinary and gastrointestinal events present in 16 (2.7%) and nine (1.5%) cases, respectively. Five years post-implant potency was preserved in 67% of those patients potent at treatment.
Conclusions: Brachytherapy is an efficacious treatment with long-term control of prostate cancer in men ⩽60 years at treatment, was associated with low rates of treatment-related toxicity and can be considered as first line treatment for localised prostate cancer.

Conflicting interests

The author declares that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors

Poster abstracts

P1 The BAUS Radical Cystectomy Audit 2014: current practice, and an analysis of the effect of procedure volume

C Miller, J Cresswell, E Rowe, E Jefferies, S Fowler, L Hounsome and J S McGrath
Royal Devon and Exeter Hospital, UK

Introduction: Data collected as part of the BAUS cystectomy audit describes current practice across England in 2014.
Patients and methods: A total of 1601 radical cystectomies, performed by 135 consultants over 64 sites, were uploaded to the BAUS audit and data platform (78% of total procedures performed). Centres and surgeons were grouped by volume of procedures performed (centres: low-volume <15 cases; medium-volume 15–30 cases; high-volume >30 cases; surgeons: low-volume <5 cases; medium-volume 5–15 cases; high-volume >15 cases), allowing comparison and evaluation of differences in practice and outcomes.
Results: The median number of radical cystectomies: nine/surgeon (1–60), 19.5/centre (1–76). Approximately 60% of procedures were performed by high-volume surgeons/centres; 6% of patients had orthotopic bladder substitution.

Table 1.1.

	RARC	LRC	ORC
% Procedures	14.5%	9.1%	78.3%
Length of stay	8 days	8 days	12 days
Transfusion rates	11.1%	10.4%	28.5%

RALP: robotic-assisted radical cystectomy; LRP: laparoscopic radical cystectomy; ORP: open radical cystectomy.

Table 1.2.

	Centres			Surgeons		
	Low-volume	Medium-volume	High-volume	Low-volume	Medium-volume	High-volume
% Cases performed	14.8%	25.2%	60.0%	5.3%	35.6%	59.1%
Robotic cases	4.7%	20.7%	74.6%	2.6%	28.4%	69%
Lymph node yield >11	61%	51%	70%	35%	62%	70%
Positive surgical margins	6.6%	8.7%	9.0%	4.4%	7.8%	9.3%
Transfusion rate	34.5%	31.6%	18.0%	20.4%	25.5%	22.6%
Clavien–Dindo ⩾3 complications	8.0%	12.0%	10.2%	9.3%	7.5%	11.9%
30-Day mortality	0.7%	0.9%	1.9%	0%	1.3%	1.8%
90-Day mortality	0.8%	4.5%	3.2%	8.6%	2.8%	3.0%

Conclusion: In submitted data:

- Open radical cystectomy remains the commonest surgical approach.
- Robotic-assisted radical cystectomy is predominantly offered by high-volume centres/surgeons.
- Adequate lymph node dissection is more likely by high-volume surgeons.
- Transfusion rates differ markedly by centre volume.
- Reported mortality/complications vary by surgeon/centre volume.

Caution should be applied when interpreting these results due to variability in reporting.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P2 Novel 450K methylation array analyses reveal potential prognostic biomarkers in high-grade non-muscle invasive bladder cancer

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Introduction: Despite the availability of EORTC risk estimation tools, high-grade non-muscle invasive bladder cancer (HG-NMIBC) represents a clinically unpredictable disease entity. Abnormal patterns of DNA methylation are established early in tumour development, and are stable and readily measurable. Methylation analyses of HG-NMIBC may therefore identify novel biomarkers of disease outcome/treatment response at initial diagnosis, which could guide patient management in conjunction with current risk-stratification tools.
Materials and methods: Twenty-one initial presentation HG-NMIBC tumours were identified from the Bladder Cancer Prognosis Programme study, and analysed by Illumina human methylation 450 ('450K') arrays. Technical validations of array data were performed by sodium-bisulphite pyrosequencing. Tumours represented one-year clinical outcomes of 'no-recurrence', 'recurrence' or 'progression', which enabled direct comparison between these 'sub-types'.
Results: Using stringent criteria, 206 sites of DNA methylation segregated the no-recurrence tumours from their clinically more aggressive (recurrence/progression) counterparts (184 hyper and 22 hypo-methylated sites). The top 20 differentially methylated sites were identified and showed between 85.7% and 100% sensitivity and/or specificity for recurrence or progression within one year, despite intra-vesical bacillus Calmette–Guérin, and were independent, on regression analyses, of tumour (size, multifocality) and patient factors (age, gender, ethnicity, smoking status).
Conclusions: This is the first 450K array DNA methylation assessment of HG-NMIBC clinical outcomes. It shows that methylation patterns appear to segregate tumours that recur/progress within one year of initial diagnosis from those that do not recur/progress. Further work is required to validate these potential biomarkers in larger tumour cohorts; however, these analyses highlight the exciting potential of clinically useful prognostic biomarkers in this unpredictable disease.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

The work has received charitable funding from: the North Staffordshire Medical Institute, the University Hospitals of North Midlands NHS Cancer Charity.

P3 Red patches seen during endoscopic surveillance of bladder cancer: when should we biopsy?

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Objective: To determine whether the regular biopsy of red patches seen during endoscopic surveillance for bladder cancer is worthwhile.
Patients and methods: A total of 4805 flexible cystoscopy reports were retrospectively reviewed over a 12-month period (January–December 2015) and those found to have red patches at check flexible cystoscopy were included in the study. A proportion of them had biopsies which underwent histopathological analysis.
Results: A total of 241 flexible cystoscopies performed on 183 patients on endoscopic surveillance for bladder cancer had red patches, and of these 120 (49.8%) had a history of intravesical bacillus Calmette–Guérin therapy. Eighty-five patients (35.3%) underwent biopsy of the red patch. Malignancy was found on 20 biopsies (23.5%), of which 11 out of 20 (55%) had carcinoma *in situ*. No malignancy was found in any patients on surveillance for low-risk bladder cancer. The majority of recurrences were found in patients who had been biopsied within the last 7–12 months.
Conclusion: We recommend the biopsy of red patches found during endoscopic surveillance of patients with intermediate/high-risk bladder cancer if no biopsy has been performed within the previous 12 months due to the high yield of malignant recurrence identified.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P4 Twelve-month follow-up results after sequential intravesical BCG and device-assisted chemo-hyperthermia (Combat BRS) for high-risk non-muscle invasive bladder cancer patients: our response to the BCG shortage

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Introduction: Until autumn 2014, our standard bladder-sparing treatment for high-risk non-muscle invasive bladder cancer (HR-NMIBC) was a full-dose intravesical bacillus Calmette–Guérin (BCG) 6-week induction course and maintenance BCG for 1–3 years. In response to the shortage of BCG, we modified our regimen to sequential full-dose BCG and device-assisted chemo-hyperthermia (mitomycin C delivered by the Combat BRS system). Here we present our 12-month results.
Materials and methods: Our 6-week induction protocol became BCG for weeks 1 and 2, Combat BRS weeks 3, 4, 5 and BCG week 6. The SWOG maintenance schedule was used but Combat BRS replaced BCG. Forty-three HR-NMIBC patients started treatment between October 2014 and June 2015. Ten were excluded due to previous BCG, mitomycin C or radiotherapy. Therefore, we reviewed 33 HR-NMIBC patients with at least 12 months follow-up.
Results: Recurrent HR-NMIBC was detected in three of 33 patients (9%) at 6 months. Progression to muscle invasive bladder cancer was demonstrated in one patient (3%) at 6 months. One patient (3%) presented with metastatic disease at 13 months. Only three patients (9%) were intolerant of Combat-mitomycin C requiring cessation of treatment. Therefore, five of 33 patients (15%) were refractory to sequential BCG/Combat BRS by 13 months; all five had carcinoma *in situ* and/or T1 at diagnosis. Twenty-eight patients (85%) were disease free at 12 months.
Conclusions: Our early results with sequential BCG/Combat BRS at 12 months are promising and comparative at this time point with those expected for HR-NMIBC patients on a standard SWOG BCG regimen. Tolerability appears higher than in previous sequential treatment studies.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P5 Doxazosin-induced cell death of HT1376 bladder cancer cells is mediated by autophagy both *in vitro* and *in vivo*

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Introduction: Doxazosin, an α1 adrenergic antagonist, decreases the incidence of bladder and prostate cancers. Furthermore, doxazosin reverses drug resistance to chemotherapy and has an additive effect when combined

with chemotherapy. The objective of this study was to identify, using chemical inhibitors and TEM, whether the anti-neoplastic activity of doxazosin on bladder cancer is mediated through autophagy *in vitro* and if such anti-tumour activity can be demonstrated *in vivo*.

Materials and methods: HT1376 cells were grown in EMEM (supplemented with 1% antibiotic solution containing penicillin/streptomycin and 10% fetal bovine serum) at 37°C in humidified 5% carbon dioxide for *in vitro* studies. For *in vivo* studies, athymic mice ($n=\geqslant 3$/group) were injected subcutaneously with cell suspension of HT376 in matrigel or vehicle control.

Results: Pre-treatment with 3-methyl adenine or dansylcadaverine significantly reduced the cytotoxicity of doxazosin. TEM appearances of vehicle-treated HT1376 cells remarkably differed from those treated with doxazosin; the latter showed distinct morphological characteristics of autophagy with autophagosomes containing mitochondria (mitophagy). Also, notable features of apoptosis and necrosis such as karyorrhexis and pyknosis were absent in both treated groups. Doxazosin (3 mg/kg; intraperitoneally) administered mice showed a significant reduction in size of implanted HT1376 tumour cells at 14 days when compared to vehicle-treated controls.

Conclusion: We have shown for the first time doxazosin-induced cell death in HT1376 bladder cancer cells is mediated by autophagy (mitophagy), and demonstrated reproducible antineoplastic activity of doxazosin *in vivo*. These novel findings may be exploited as a potential therapeutic target for the treatment of bladder cancer.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P6 Isolated *de novo* red patches at flexible cystoscopy: malignant incidence at a one-stop haematuria clinic

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Introduction: Flexible cystoscopy is a paramount diagnostic tool used in the investigation of haematuria. It is not uncommon, in our teritiary centre, to see solitary or multifocal flat red patches, which pose a diagnostic challenge, as both carcinoma *in situ* and non-specific inflammation may appear macroscopically similar at flexible cystoscopy. The objective of this study is to determine the incidence of significant pathology identified after bladder biopsy of *de novo* red patches following flexible cystoscopy for investigation of haematuria.

Patients and methods: A total of 1961 haematuria clinic flexible cystoscopy reports were retrospectively reviewed over a 12-month period (January–December 2015). A proportion of the flexible cystoscopies identified red patches, some of which were biopsied and underwent histopathological analysis.

Results: One-hundred and nine out of 1961 (5.6%) flexible cystoscopies performed on patients with haematuria had red patches seen in the bladder. The median age was 69 years, 52% were men and overall 52 red patches were biopsied (47.7%). Malignancy was diagnosed in seven out of 34 patients (20.6%) who underwent flexible cystoscopy or rigid cystoscopy and biopsy in our haematuria clinic. Of the 46 patients referred for a repeat flexible cystoscopy, 25 had spontaneous resolution of their red patches (54.3%) and 18 were biopsied, upon which a further three malignancies were found. Overall, malignancy was diagnosed in 10 out of 52 patients (19.2%) who underwent biopsy for a red patch in the context of haematuria.

Conclusion: We recommend the biopsy of all red patches found during flexible cystoscopy in the investigation of haematuria due to the significant amount of malignancies identified.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P7 Service implications of introducing a fast-track prostate clinic with pre-biopsy magnetic resonance imaging: review of 1104 patients

K Wang, B Woodrow and W R Cross
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Introduction: An independent cancer taskforce has recommended that the urgent (2-week) referral pathway is phased out and replaced with a new diagnosis metric by 2020. Patients with suspected cancer should be informed of their diagnosis within 4 weeks, with 50% definitely diagnosed or cancer excluded within 2 weeks (Achieving world-class cancer outcomes: a strategy for England 2015–2020). With the introduction of prebiopsy multiparametric imaging (mpMRI) achieving this target in prostate cancer will require a streamlined multi-specialty diagnostic pathway.

Patients and methods: In September 2014, through a multi-specialty initiative, we introduced two new services, a fast-track clinic delivered by prostate cancer specialists and routine pre-biopsy mpMRI. This study reports the retrospective review of the management of 1104 men who have been managed in the new service.
Results: The median time from GP referral to clinic review was 8 days; 12.7% of men were discharged without further investigation or treatment. MpMRI for suspected cancer was performed in 48% of men with a median time to scan of 2 days (18.6% same-day imaging); 47% had a prostate biopsy with a cancer detection rate of 65.9%. The median time from clinic to histological diagnosis was 18.5 days. The negative predictive value for PIRADS 1/2 was 78% and the positive predictive value for PIRADS 4/5 was 74%; 37.6% of referrals received treatment for prostate cancer.
Conclusions: This study demonstrates that the proposed 4-week diagnosis metric is achievable, but the 2-week target may be too ambitious.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P8 Long-term experience with 4D brachytherapy: a real-time brachytherapy technique for the management of prostate cancer

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Introduction: 4D brachytherapy is a novel low-dose rate brachytherapy approach for prostate cancer that uses stranded and loose seeds performed as a one stage real-time implant. We assessed treatment outcomes of 4D brachytherapy and compared them with the conventional two-stage method.
Methods: Analysis of 3315 men who underwent low-dose rate brachytherapy in a single institution using prospectively collected data. Patients were included for analysis if they had over 3 years post-implant follow-up and a minimum of four prostate-specific antigen (PSA) measurements.
Results: We compared outcomes of 1063 men treated with the two-stage method and 854 men with 4D brachytherapy. Median follow-up times were 10.3 and 4.8 years ($P<0.001$) for two-stage and 4D cases, respectively. Post-implant dosimetry showed that 4D resulted in significantly reduced variance compared to two-stage cases ($P<0.009$). Clinical and biochemical control was significantly improved with 4D brachytherapy versus two-stage in low ($P<0.001$), intermediate ($P<0.001$), and high risk ($P<0.02$). To control for follow-up length time bias between techniques, a PSA cut-off of 0.4 ng/ml at 48 months was used as a surrogate marker for failure. This again showed that significantly more patients failed treatment with the two-stage method relative to 4D ($P<0.01$). Approximately 50% of patients whose PSA was $\geqslant$0.4 ng/ml at 4 years ultimately developed biochemical failure for both groups. 4D brachytherapy patients showed significantly better international prostate symptom score ($P<0.01$) and urinary quality of life ($P<0.001$), while there was similar potency in the two groups ($P=0.4$).
Conclusions: Compared to the conventional two-stage technique, 4D brachytherapy was associated with improved biochemical control and with reduced treatment-related toxicity.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P9 Radical prostatectomy in patients with high-risk disease: as determined by preoperative magnetic resonance imaging, Gleason grade and prostate-specific antigen

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Introduction: All current definitions of high-risk prostate cancer incorporate clinical T staging. Surgical outcomes of patients who are risk-stratified using multi-parametric magnetic resonance imaging (MRI) have not previously been reported. In this study we report the 7-year biochemical recurrence (BCR)-free survival probability in patients with high-risk disease (defined as prostate-specific angigen (PSA) >20 ng/ml, Gleason 8–10 or radiologically $\geqslant$T3a on pre-biopsy multi-parametric MRI) treated with laparoscopic/robotic-radical prostatectomy. We also analysed the influence of individual risk factors on outcome.
Methods: From our prospectively maintained database we identified all laparoscopic and robotic-assisted radical prostatectomy (± pelvic lymph node dissection) performed between April 2009 and April 2016. A total of 195 out of 614 (32%) were identified as preoperative high risk (68 laparoscopic, 127 robotic). All high-risk patients had a bone scan or MRI skeletal survey to rule out metastases.
Results: The median age was 57 years (range 48–76), mean PSA 11.2 ng/ml (0.6–43.8) and median follow-up 29.6

months (2–84). Overall BCR-free survival probability was 64.8% at 7 years. Twenty-four (12.3%) patients received early adjuvant treatment. Of the remaining 171 (87.7%) who had PSA surveillance, BCR-free survival probability was 73.5%. The risk of adjuvant treatment depended on the number of preoperative high-risk factors. Only 10% of patients with one risk factor alone received adjuvant treatment compared to 17% with two risk factors and 40% of patients who had all three. A higher Gleason score (HR 1.81, *P*=0.002), stage (HR 1.77, *P*=0.04) and PSA nadir ⩾0.02 were associated with BCR.

Conclusion: Patients with suspected T3 disease on pre-biopsy MRI have a low risk of BCR provided they have only one other risk factor.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P10 Predictors of upgrading and upstaging in clinically favourable intermediate-risk prostate cancer

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Introduction: Patients with GL3+4 prostate cancer may be safe to undergo a period of active surveillance if they have a prostate-specific antigen (PSA) level <10, no primary Gleason 4 pattern, cT2 disease (favourable intermediate risk). We aimed to determine the predictors of occult higher grade or extra-prostatic extension at final pathology in these patients.

Patients and methods: A total of 236/805 patients from a prospective laparoscopic radical prostatectomy database had favourable intermediate-risk disease and were included. Clinical features were investigated for association with upgrading to ⩾GL4+3 and/or ⩾T3a.

Results: Favourable intermediate-risk patients were mostly at risk of unsuspected T3 disease rather than Gleason upgrading: 27 (11.4%) had upgrading, 29 (12.3%) had downgrading, 72 (30.5%) had ±T3a. A total of 210 (89%) had preoperative MRI scans negative for suspected T3 disease. Of age, number of positive cores, total percentage of core length involved, transrectal ultrasound (TRUS) prostate volume, and TRUS-PSA density, only TRUS-PSA density approached significance for association with upgrading ± upstaging (0.13 (0.09–0.18) vs. 0.16 (0.10–0.23) *P*=0.05). There was no significant difference in pathological tumour volume (upgrade ± upstage: 1.91 cm^3 (0.81–6.06) vs. no upgrade ± upstage: 2.27 cm^3 (1.08–4.46) *P*=0.24). Pathologically measured prostate volume was significantly smaller in patients with upgrading ± upstaging (39.6 cm^3 (34.9–45.8) vs. 52.0 cm^3 (38.3–80.5) *P*=0.003) and when PSA density was calculated with this path-volume rather than TRUS-volume, path-PSA density was significantly associated with upgrading ± upstaging (0.10 (0.06–0.17) vs. 0.15 (0.12–0.23) *P*=0.001).

Conclusion: A smaller prostate volume (but not tumour volume) and PSA density calculated using accurately measured prostate volume (rather than TRUS volume) is strongly associated with upgrading ± upstaging (mostly due to occult T3a disease) in favourable intermediate-risk prostate cancer.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P11 Towards a magnetic resonance-based nomogram for the prediction of transperineal prostate biopsy outcome

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Introduction: Total prostate-specific antigen (PSA) alone is a poor predictor of prostate biopsy outcome. Pre-biopsy multiparametric-magnetic resonance imaging (mp-MRI) may provide further information utilising magnetic resonance-based PSA density and prostate imaging reporting and data system (PI-RADS) scoring. The study aim was to develop and validate a nomogram for the prediction of transperineal prostate biopsy outcome incorporating magnetic resonance-derived information.

Patients and methods: A total of 615 consecutive men who underwent pre-biopsy mp-MRI and transperineal 24–40 core sector-guided prostate biopsies were included. A multivariable logistic regression model was constructed to predict overall prostate cancer detection considering age, PSA, PSA density, PI-RADS score and history of previous negative transrectal biopsy. Internal validation was performed by calculating the concordance index (c-index) from 200 generated bootstrap samples.

Results: See Table 11.1 for patient characteristics and multivariate analysis of contribution to the predictive model. PSA was excluded given high correlation with PSA density (*r*=0.81). The nomogram developed from the logistic regression model had good discrimination with a c-index of 87% (95% confidence interval 84–90%). The c-index improved when examining significant prostate cancer.

Table 11.1.

	Prostate cancer (*n*=317)	No cancer (*n*=298)	Odds ratio (95% CI) (multivariable analysis)
Age (mean±SD), years	66.7 ± 6.9	64.1 ± 6.5	1.51 (1.13, 2.01)
PSA (mean±SD), ng/ml	20.6 ± 53.4	9.9 ± 9.2	N/A
PSAD (mean±SD), ng/ml^2	0.58 ± 2.81	0.15 ± 0.13	3.17 (1.74, 5.77) (>0.16 ng/ml^2)
PI-RADS score, *n* (%)			
1	5 (2%)	38 (13%)	1.0
2	24 (8%)	108 (36%)	1.59 (0.54, 4.61)
3	37 (12%)	90 (30%)	2.84 (0.99, 8.13)
4	72 (23%)	45 (15%)	8.38 (2.94, 23.90)
5	178 (56%)	17 (6%)	43.12 (14.34, 129.72)
No previous negative biopsy, n (%)	40/317 (13%)	91/298 (31%)	2.18 (1.29, 3.69)

CI: confidence interval; PSA: prostate-specific antigen; PSAD: prostate-specific antigen density; PI-RADS: prostate imaging reporting and data system.

Conclusions: A magnetic resonance-based nomogram is a useful tool for the prediction of prostate biopsy outcome and may contribute to the biopsy decision-making process.

Conflicting interests

The authors declare that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

P12 Freehand transperineal prostate biopsy using the precision point transperineal access system under local anaesthesia

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Introduction: With an increasing interest in active surveillance and concern about rising rates of post-biopsy infections, there is an imperative to rethink how prostate biopsies are performed. Transperineal template biopsies (TTBs) of the prostate have been shown to improve disease characterisation and reduce the risk of serious adverse events. The major obstacle preventing the adoption of TTBs is the increased resource utilisation and procedure time.

Materials and methods: The precision point transperineal access system (PPTAS) enables a freehand, template-style biopsy without the resource and budget impact inherent in current practice. A retrospective review of all prospectively performed freehand transperineal prostate biopsies using the PPTAS under local anaesthesia between August 2012 and 2016 was undertaken.

Results: Sixty-six patients underwent a freehand transperineal prostate biopsy under local anaesthesia using the PPTAS. The procedure was well tolerated by all patients, with probe insertion and local anaesthetic injection, both in the short and longer term. Staff and resource utilisation was less than those patients undergoing a traditional TTB and the mean procedural time was also shorter. Cancer detection rates were similar to traditional TTBs. No complications were reported (including infection, haematuria requiring intervention, emergency department admissions or cases of urinary retention).

Conclusion: Freehand transperineal prostate biopsy using the PPTAS under local anaesthesia is well tolerated and utilises fewer resources compared to a TTB. The next stage will be the initiation of a comparator study of the PPTAS to benchmark against a standard transrectal ultrasound biopsy – relative cancer detection rates and adverse events will be key indicators.

Conflicting interests

The authors declare the following conflict of interest: Perineologic LLC.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.