

# **1. Radiofrequency Ablation versus Partial Nephrectomy for cT1 Small Renal Masses; a Comparison of Clinical and Oncological Outcomes**

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## **Introduction**

We aim to compare the safety profiles and oncological outcomes of partial nephrectomy(PN) and radiofrequency ablation(RFA) for cT1 renal masses.

## **Materials**

We retrospectively analysed 284 patients with cT1 renal masses treated with either PN or RFA between 2003 and 2016. Patients were analysed according to their demographics and RENAL nephrometry score. Follow-up protocol consisted of a tri-phasic renal CT scan at 3-6 months and yearly thereafter. Magnetic resonance imaging(MRI) was used for those with poor renal function.

Local recurrence (LR) for PN was defined as abnormally enhancing new lesion at the site of previous resection. For RFA, LR was defined as interval growth or new enhancement of a successfully treated lesion on subsequent imaging. StatsDirect was used for the statistical analysis. A p-value less than or equal to 0.05 was considered statistically significant.

## **Results**

After excluding patients with less than 5-year FU and those with benign pathology, 46 RFA and 37 partial nephrectomy patients were included. There was no significant difference in patients' demographics nor RENAL scoring system( $p=0.7$ ,  $0.3$  respectively). Post procedural hospital stay(days) was 1.3,4.9( $p=0.04$ ) for RFA and PN respectively. Peri-operative complication rate was significantly higher in the PN group( $p=0.047$ ).

At 5-year follow-up, there were 6 failed RFA cases and one PN local recurrence( $p<0.0001$ ). The 5-year cancer-specific survival was 98% and 100% for RFA and PN respectively(95% confidence interval [CI] 0.7 to 1.7,  $p=0.31$ ); 5-year overall survival for the RFA and PN was 89% and 92% (95% CI 0.7 to 1.8,  $p=0.29$ ). Limitations include selection bias and the difference in patients' demographics in the two groups.

## **Conclusion**

Peri-operative complications were predictably higher with the PN group. However, oncological outcome was better in this group, compared with RFA. Validation of these results with long-term follow up is important given the disparity in complication rate and severity.

## **2. The end of transfaecal biopsies:**

### **Systematic and targeted transperineal prostate biopsies under local anaesthetic in outpatients**

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#### **Introduction:**

Traditionally, prostate biopsies have been performed in an outpatient setting via the transrectal (TRUS) approach. The PrecisionPoint™ transperineal access system enables both standard systematic template and targeted transperineal prostate biopsy, using an ergonomic disposable freehand device under local anaesthetic in the outpatient setting.

#### **Methods & Patients:**

137 patients underwent prostate biopsies using the PrecisionPoint™ system from April 2016 to August 2017. Initial cases were performed under general anaesthetic (GA) in day surgery to enable familiarisation with the technique and local anaesthetic (LA) protocol. Cognitively targeted biopsies were performed in 26 patients, a further 28 had targeted biopsies in addition to the standard template. Median age was 64.6(33-83)years, median PSA 7.5(0.7-1374)ng/ml with a median prostate volume of 40(10-157)cc. Histological and oncological outcomes were recorded, in addition to pain scores using the validated 'Visual Analogue Score' (VAS) for ultrasound probe insertion, LA administration, biopsies and overall rating.

#### **Results:**

13 were performed under GA, 16 under Sedation + LA, and 108 with LA only. Comparing LA transperineal vs. conventional TRUS biopsy methods, VAS scores were not significantly different. However, patients who underwent LA transperineal biopsies in Day Surgery compared with the outpatient department reported significantly higher pain scores for the 3 procedural stages ( $P<0.05$ ), but not overall ( $P=0.07$ ). 111 (81%) were for primary biopsies, 22 (16%) were on active surveillance (AS), and 4 (3%) were for restaging. Of the 111 primary biopsies, 79 (71%) were positive and 32 (23%) were benign. Cancer pickup rates were similar to conventional transperineal biopsies. Complications were urinary retention in one patient and clot retention in another, which resolved. No patients developed sepsis.

#### **Conclusions:**

Prostate biopsies can be performed safely under LA in an outpatient setting using the PrecisionPoint™ system, with good histological outcomes. This method of transperineal biopsy has potential to supersede the transrectal approach.

### **3. The safety and efficacy of Robotic assisted radical cystectomy in octogenarians using the multidisciplinary enhanced recovery programme**

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#### **Objective:**

Radical cystectomy is the standard surgical management for muscle invasive and high risk non-muscle invasive bladder cancer. Robotic assisted radical cystectomy is rapidly evolving as a surgical option with equal oncological outcomes. Few patients above 80 years undergo cystectomy because of high morbidity and mortality. We aim to evaluate the safety and efficacy of Robotic assisted radical cystectomy in this population.

#### **Materials and Methods:**

Between May 2013 and May 2017, 195 patients underwent robotic assisted radical cystectomy with the newly introduced multidisciplinary enhanced recovery programme. Of these 23 patients were 80 years and older and formed the cohort of this study. All patients underwent thorough preoperative assessment including cardiopulmonary exercise testing. Retrospective analysis of the data collected from the institutional database were analysed for ASA score, estimated blood loss, transfusion requirements, length of hospital stay, 90 day morbidity and mortality.

#### **Results:**

The mean age was 82.1 (range 80-89). Indication for cystectomy was for muscle invasive bladder cancer in 20 patients, 2 patients underwent salvage and one patient underwent palliative cystectomy. The mean ASA score was 2. The average blood loss and operative times were 174 ml (range 50–300 ml) and 368 minutes (range 215–540 min). None of the patients needed blood transfusion. The average length of hospital stay was 7 days (range 4–17 days). Clavien Grade 3 complications were seen in 2 patients and Grade 4 in one patient. One patient died postoperatively on Day 4.

#### **Conclusion:**

Our results show that robotic assisted radical cystectomy in octogenarians is safe and feasible with acceptable morbidity and mortality.

#### **4. Antibiotic resistance in a high-risk population undergoing Transrectal Ultrasound guided biopsy of the prostate: overcoming the challenge**

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##### **Introduction**

Transrectal Ultrasound (TRUS) guided-biopsy of the prostate is a widely-used technique in the diagnosis of prostate cancer, and sepsis is an important cause of morbidity and mortality post-procedure. Quinolones are commonly used within prophylaxis regimes, but antibiotic resistance in the commensal rectal flora poses a significant barrier to reducing post-biopsy sepsis rates, and international travel is a risk factor. We report on the challenges of antibiotic resistance within a high-risk immigrant population in East London, and the efficacy of implementing tailored antibiotic regimes based on pre-biopsy rectal swabs.

##### **Methods**

Over 18 months, patients undergoing TRUS-biopsy at Whipps Cross hospital were retrospectively identified along with those presenting with post -biopsy sepsis. All were given standard prophylaxis, with diabetic patients receiving an extended course. A protocol was then introduced whereby patients underwent a rectal swab to assess antibiotic sensitivities, and a tailored prophylactic regime was administered to those displaying ciprofloxacin resistance. The records of the following 18 months were analysed.

##### **Results**

Over a 36-month period, 2002 patients underwent TRUS-biopsy. In the 18 months prior to the introduction of our protocol, of the 917 patients biopsied, 0.55% presented with post-biopsy sepsis. In the 18 months following the introduction of our protocol, 1085 patients underwent TRUS-biopsy of which 50.8% successfully received a pre-biopsy rectal swab. The post-biopsy sepsis rate was 0.28%, conferring a 49.1% relative reduction. Only one patient with sepsis had received a rectal swab, and this had not revealed ciprofloxacin-resistant organisms. Of 551 rectal swabs taken, 16.9% of patients had ciprofloxacin-resistant bacteria.

##### **Conclusions:**

Our protocol successfully reduced the post-biopsy sepsis rate. As quinolones remain the antibiotic of choice for TRUS-biopsy, we suggest performing rectal swabs on all patients prior to the procedure. Increased adherence to pre-biopsy rectal swabs may reduce sepsis rates further, with appropriate guidance from microbiology on tailored regimes.

## **5. Risk stratified imaging follow up for renal cancer identifies most recurrences at an asymptomatic stage**

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### **Introduction**

Patients who undergo radical or partial nephrectomy for renal cell carcinoma are routinely followed up with radiological surveillance, but there is variation in modality, frequency and duration of follow-up. We report retrospectively on experience from follow-up at one centre on cases done from June 2011 to September 2014, using a risk-stratified surveillance protocol.

### **Methods**

154 patients had diagnoses of kidney cancer at MDT. Data were collected for the 151 with notes available on presentation, histology, follow-up investigations and disease status at last follow-up. The follow-up protocol was risk stratified on histology, and by Leibovich score for clear cell RCC.

### **Results**

126 patients had localised disease at presentation and proceeded to partial or radical nephrectomy. Follow-up duration was 0-2055 days (mean 875). Histology, 84.3% were clear cell (ccRCC), 9.3% were papillary (pRCC), 4.3% were chromophobe and 2.1% others.

20 patients developed metastatic disease on follow-up (19 ccRCC and 1 pRCC), representing 18% of ccRCCs and 8% of pRCCs. 85% of metastases were discovered on scheduled follow-up imaging, 10% in response to symptoms and 5% incidental findings on imaging done for other reasons. All metastases were found on CT imaging. Duration from operation to metastasis was 18-1110 days (mean 399 days).

### **Discussion**

Histology findings and rates of metastatic disease on follow-up are in line with national rates, including when ccRCC is stratified by Leibovich score.

The vast majority of patients with metastases were diagnosed on routine follow-up imaging (85%), while previous data suggested that most presented clinically. It's possible that metastatic disease could be detected earlier by more intensive imaging of appropriate risk groups.

Many patients undergo annual chest X-rays during follow-up, but in our experience, no metastases were detected by this method and it is not always done regularly in the community. The value of chest X-ray is therefore questionable.

## **6. Percutaneous Microwave versus Radiofrequency Ablation of small renal cancers: Intermediate Follow-up**

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### **Introduction**

There is an increase in the incidence of renal cancer diagnosis, with a clear trend towards an earlier stage shift. Nephron sparing treatment is the gold standard for T1 tumours, with comparable oncological outcomes to radical nephrectomy with preservation of renal function. Focal ablative therapies constitute a viable alternative to the partial nephrectomy, especially for high risk surgical candidates and those who are not keen on major operations. We aim to compare the effects of the microwave ablation (MWA) to radiofrequency ablation (RFA) for small renal cancers.

### **Method**

Data was collected on RFA and MWA cases performed between September 2003 and August 2016 at a single tertiary referral centre. Follow up protocol consisted of triple phase CT scan of the abdomen (or MRI for those with poor renal function) 4-12 weeks after the procedure and yearly thereafter. Statistical analysis was performed using IBM SPSS Statistics 24. Treatment and complication rates were assessed using the Chi-squared test. Recurrence and survival data was calculated using the Kaplan-Meier technique. A p-value less than 0.05 was considered statistically significant.

### **Results**

Both groups (RFA n=136, MWA n=79) had similar demographics. RENAL nephrometry scoring was comparable in both groups (p=0.75). There was no difference in treatment success rate (p=0.09). Complication rate was significantly higher in MWA (p=0.04). At a median follow up of 19 for MWA and 57 months for RFA, local recurrence-free, metastasis free and overall survival was similar (p= 0.85, 0.74, 0.16 respectively).

### **Conclusion:**

RFA and MWA provide a viable treatment option for small renal cancers. MWA carries higher peri-operative complications. This may improve with experience and technological advancement. Longer follow is required to validate these results.

## **7. The role of percutaneous renal biopsy in renal mass lesions: Five-year experience from a UK high-volume centre**

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### **Background**

The increased usage of cross-sectional imaging has resulted in an increasing detection of incidental renal lesions. This places an increased burden on urological services. Percutaneous renal biopsy (RB) is a useful diagnostic tool with a high diagnostic yield of 78-97% and low morbidity. This study aims to evaluate the role, efficacy and safety of RB in the assessment of renal mass lesions in a high-volume UK centre.

### **Methods**

The electronic records of all patients undergoing RB between January 2012 and December 2016 were evaluated. Outcome measures included diagnostic yield rate, accuracy of RB histology compared with final histology following radical (RN) or partial nephrectomy (PN), malignancy rate and complication rates.

### **Results**

181 RB were conducted in this period but 46 cases did not meet the inclusion criteria. Mean age was 72.9 years and 68.4% were male. Mean lesion size was 3.4cm (range 0.5-18cm). The majority of RBs (68.1%) were performed for small renal masses. 70.4% of RBs were malignant. 15.6% of RBs were non-diagnostic, with 38.5% being non-diagnostic in lesions <2cm. 14.9% of lesions <3cm were benign. 19 RBs were performed for complex renal cysts, with a diagnostic yield rate of 84.2%. Overall, 42 patients underwent either RN or PN. Histological subtype was accurate in 77% of RB reports whilst Fuhrmann grading was accurate in only 46%. There were no major complications, with no patients requiring transfusion or embolisation.

### **Conclusions**

RB is a safe and effective tool in the evaluation of renal lesions with a high diagnostic yield overall as well as a low morbidity. However, diagnostic yield was lower in tumours <2cm. 15% of lesions <3cm were benign, an important consideration when counseling young, fit patients for active treatment. Accuracy of Fuhrmann grading in RB when compared with final histology was poor overall, particularly in high-grade tumours.

## **8. The evolution of robotic assisted partial nephrectomy: Improving Pentafecta outcomes in advanced tumours**

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### **Introduction & objectives**

Robotic assisted partial nephrectomy (RAPN) is the predominant method to treat small renal masses. Recent studies demonstrate equivalent short-term oncological outcomes with reduced peri-operative morbidity. We analysed our results looking at casemix with disease parameters and pertinent outcomes of both operative and oncological variables.

### **Materials & methods**

We reviewed our prospectively collated database of all RAPN performed sequentially in our unit between 2010 and 2017. Cases were divided into 3 case cohorts. Variables included age, BMI, ASA, estimated GFR (eGFR), tumour size, PADUA score, operative time, blood loss, warm ischemic time (WIT) and length of stay (LOS). The renal Trifecta was defined as WIT  $\leq 25$  minutes, negative surgical margins and absence Clavien  $\geq 3a$  complications. Pentafecta was defined as achievement of Trifecta with addition of over 90% eGFR preservation and no chronic kidney disease (CKD) stage upgrade. Results were analysed using non-parametric analysis.

### **Results**

300 cases were performed with clinical features below (Table 1).

There was a steady increase in patient and tumour complexity while our Pentafecta rates significantly and steadily increased over the cohorts (Table 2).

### **Conclusion**

Despite performing RAPN on more comorbid patients with greater BMI who have larger more complex lesions the pentafecta rates have climbed. LOS is shorter without a concomitant increase in WIT. In our experience this affirms the evolution of RAPN utility in the more complex patient and more complex pathology.

## 9. Radiological progression and clinical outcomes of Bosniak 2F cysts

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### Introduction:

The Bosniak classification describes a 15% risk of malignant transformation in 2F cysts, and therefore recommends computed tomography (CT) surveillance. We investigated our adherence to our 5-year surveillance protocol and the incidence of cyst progression.

### Methods:

Retrospective analysis of all Bosniak 2F cysts diagnosed on CT from 2006-2013 to assess radiological progression and clinical outcome.

### Results:

97 cysts were identified in 97 patients (58 male, 39 female; mean age 65 years, range 28-90 years). Cyst were identified in the right (n=49), left (n=47) and in one transplant kidney; upper pole (n=35), lower pole (n=42), and in the interpolar region (n=20). Mean cyst size measured 4.9cm (range 0.7cm – 20 cm). Cysts were an incidental finding in 72 patients, the remainder presented with haematuria (n=18), loin pain (n=4), unknown reason (n=2), and a family history of polycystic kidney disease (n=1). Twenty-five patients received  $\geq 5$  years' surveillance (mean 39 months; range 6-90 months); only 9 adhered to the follow up protocol. Five cysts increased in size but did not progress. Seven progressed, of which 4 underwent nephrectomy. All progression occurred within the first 18 months of surveillance. No cyst related mortality occurred.

### Conclusion:

The majority of cysts were incidental findings. Whilst 97% of patients did not receive our 5-year specified screening protocol, 61% did received at least  $\geq 3$  years surveillance. As all progression occurred within 18 months, an argument could be made for reducing the surveillance regimen.

## 10. Tyrosine Kinase Inhibitors for Metastatic Renal Cell Carcinoma – What Should We Tell Our Patients?

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### Introduction

Tyrosine Kinase Inhibitors (TKI) are established as standard treatment in Metastatic Renal Cell Carcinoma (MRCC). However, clinical outcomes are less well known to Urological Surgeons as patients are managed by Oncologists. We performed an overview of contemporary TKI use over 6 years.

### Patients and Methods

Using an electronic database we gathered data for patients treated with TKI for MRCC between 2010- 2016. Parameters included cancer specific survival, disease progression/regression and drug toxicity.

### Results

We identified 91 patients treated with a TKI (64 males, 27 females, median age 63 years; range 46-92). Patient sub-groups included a) TKI alone (n=24), b) early TKI following cytoreductive nephrectomy (n=20), c) delayed TKI following historical nephrectomy with subsequent development of metastases (n=47). Median cancer specific survival for each sub-group was a) 163 days; b) 495 days, median time for TKI initiation to death 396 days; c) 873 days, median time for TKI initiation to death 381 days.

Response to TKI at 6 months included: 32% stable disease, 26% partial regression, 4% complete resolution, 19% disease progression, 19% died within 6 months. Eight patients required hospital admission for sepsis, 9 patients developed thromboembolic complications. No patient suffered grade 3 GI tract or neuro-toxicity. One patient discontinued treatment.

### Conclusion

We have clarified contemporary anticipated outcomes and side effects for patients embarking on TKI therapy. This has enhanced our ability to counsel patients with MRCC. We note similarities in cancer specific survival once TKI are started when comparing patients treated with 'up-front' TKI versus delayed initiation.

## **11. Managing Bladder Cancer Pain With Morphine May Have Detrimental Consequences on Patient Outcomes? In Vitro Studies**

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### **Objective:**

To determine the effect of morphine on bladder cancer cell proliferation and apoptosis in vitro.

### **Materials and Methods:**

MTT assay was used to measure residual viable biomass of RT-112 human bladder cancer cells after 72 hours of morphine/morphine + naloxone treatment. Expression of mu-opioid receptors was assessed by Western blot and finally, apoptotic assays were carried out using confocal microscopy. Data was analysed using descriptive statistics and Student's paired t-tests using Graphpad Prism (Graphpad Software, San Diego, CA).

### **Results:**

The MTT assays showed that morphine increased RT-112 cell growth ( $p < 0.05$ ). When administered together, morphine and naloxone demonstrated a competitive relationship. Western blot analysis regarding mu-opioid receptor expression in RT-112 cells remains inconclusive. Morphine was also found to decrease the rate of apoptosis of RT-112 cells, an effect which naloxone inhibited.

### **Conclusions:**

This study provides evidence that morphine, at clinically relevant doses, causes RT-112 bladder cancer cell proliferation and at least some of this effect might be due to decreased apoptosis. Clinically, this suggests that managing bladder cancer pain with morphine, might have detrimental consequences on patient outcomes.

## **12. Pre-operative Renal School improves Renal Cell Carcinoma surgical outcome, provides hospital cost saving of £960 per patient and achieves excellent patient satisfaction**

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### **Introduction and Aim**

Enhanced recovery pathways (ERP) have been proven to improve patient outcomes and reduce length of hospital stay (LOHS).<sup>1</sup> There is limited evidence regarding the role of pre-operative patient education.<sup>2</sup>

BAUS ERP guidelines specifies that a well-informed and motivated patient is integral to successful implementation of ERP.<sup>3</sup>

A pioneering pre-operative Renal School has been introduced from May 2016 at Whiston Hospital. We have assessed outcomes of this novel service.

### **Methods**

261 patients undergoing elective renal surgery over a 5year period were grouped into those attending pre-operative renal school(RS n=61) and those who did not(Non-RS n=201).

LOHS and patient satisfaction were primary outcomes. Type of surgery and surgical approach were sub-analysed (see graph 1,over page), p-values=<0.005 were deemed statistically significant.

Patient satisfaction following renal school was assessed using patient diaries, and standardised questionnaire telephone follow up at 24 hours and 7 days post-discharge.

### **Results**

RS-patients had a statistically significant reduction in mean LOHS compared to Non-RS, 4.4 vs. 6.8 days respectively (p=<0.001) (see graph 2, over page), producing a potential cost saving of £58,560 over the 8 months since introduction. This is equivalent to £ 7,320 cost saving per month and £960 per patient.

There was a consistent reduction in LOHS for RS-patients across all surgical approach sub-groups (see table 1, over page). For laparoscopic procedures the reduction in LOHS was 5.9 vs 3.7 days(p=<0.005).

Mean patient satisfaction score was: 8.5/10, 81%-rated the service as very informative/ helpful, 13%-good/useful, 6%-brilliant. 0%-as average or unhelpful (see graph 3,over page).

### **Conclusion**

Our analysis demonstrates that preoperative education in the form of renal school as part of ERP is achievable and produces significant reductions in LOS with associated cost savings. It is associated with excellent patient compliance and satisfaction.