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POD-01.01

A Large Single Centre Study Describing the Evolution of Renal Tumour Biopsy over a 13-Year Period

Richard, Patrick O.; Bhatt, Jaimin; Jewett, Michael; Komisarenko, Maria; Kachura, John R.; Evans, Andrew; <u>Finelli, Antonio</u>

Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada

Background: The incidence of small renal masses (SRMs) has increased in recent years in line with increased in abdominal imaging. SRMs are defined as enhancing solid lesions measuring \leq 4cm. We present our experience with percutaneous renal tumour biopsy (RTB) of SRMs, which to our knowledge, is the largest to date.

Methods: We reviewed our database to ascertain the incidence of benign, malignant and non-diagnostic biopsies of SRMs performed at our institution from 2001 to July 2013. A total of 519 RTBs were performed (496 SRMs). The diagnostic rate was compared over time. The accuracy of the biopsies was correlated with the definitive pathology in the cases where the biopsy led to surgery.

Results: The mean size of the 519 biopsied lesions was 2.5 (\pm 0.9) cm. The diagnostic rate at the first biopsy was 89.1% (442/496). Of the diagnostic biopsies, 116 (26.2%) were benign and 326 (73.7%) were malignant. Of the 54 non-diagnostic biopsies, 23 (42.6%) had a repeat biopsy. A diagnosis was obtained in 19 cases (82.6%; 8 [42.1%] benign, 11 [57.9%] malignant). Therefore RTB led to a diagnosis in 461 of the 496 SRMs (92.9%). Over time, there was a decrease in the rate of non-diagnostic biopsies from 15.0% to 6.0% (p>0.05). Of the available surgical pathology, there was agreement between histology in 92.5% (125/135). For the conventional cell carcinoma (n=85), there was concordance between histology and grade in 97.6% (83/85) and 96.1% (74/77), respectively.

Conclusions: RTB of SRMs provided a diagnosis in 92.9% of the cases. Surgery was avoided in more than 23% of patients following RTB because of benign histology. The rate of non-diagnostic biopsies diminished over time. Finally, there was a high correlation between the biopsy and the final pathology with regards to both histology and grade. In an era where overdiagnosis and overtreatment of favourable cancers is gaining attention, routine RTB for SRM leads to diminished intervention and, going forward ,personalization of care.

POD-01.02

Type of Surgery and Not Tumour Size, Ischemia Type, or Ischemia Duration is Predictive of Postoperative Renal Function: Results from the Canadian Kidney Cancer Information System

<u>Mason, Ross</u>¹; Tanguay, Simon²; Liu, Zhihui³; Kapoor, Anil⁴; Black, Peter⁵; Moore, Ronald⁶; Morash, Chris⁷; Lacombe, Louis⁸; Drachenberg, Darrel⁹; Rendon, Ricardo¹

¹Department of Urology, Dalhousie University, Halifax, NS, Canada; ²Division of Urology, McGill University, Montreal, QC, Canada; ³Department of Biostatistics, Epidemiology, and Occupational Health, McGill University, Montreal, QC, Canada; ⁴Division of Urology, McMaster University, Hamilton, ON, Canada; ⁵Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; ⁶Division of Urology, University of Alberta, Edmonton, AB, Canada; ⁷Division of Urology, University of Ottawa, Ottawa, ON, Canada; ⁸Department of Surgery, Laval University, Quebec, QC, Canada; ⁹Division of Urology, University of Manitoba, Winnipeg, MB, Canada

Introduction and Objectives: Patients who undergo surgical management of renal cell carcinoma (RCC) are at risk for chronic kidney disease due to loss of nephrons and intraoperative ischemic injury. This decrease in renal function is associated with both increased morbidity and increased mortality. This study explored factors associated with decreased renal function in patients undergoing partial or radical nephrectomy.

Methods: This study includes patients from the Canadian Kidney Cancer Information System (CKCIS), a multi-institutional prospectively maintained database, who underwent partial or radical nephrectomy. Univariable and multivariable logistic regression were used to determine the association between postoperative estimated glomerular filtration rate (eGFR) and type or surgery (radical versus partial), ischemia duration, ischemia type (warm versus cold), and tumour size.

Results: A total of 1703 patients were included in this study with 832 and 871 having undergone partial and radical nephrectomy, respectively. The median age of the entire cohort was 61 (interquartile range 53-69) and the median length of follow-up was 18 months (interquartile range 5-42). Among patients who underwent partial nephrectomy, the median ischemia time was 24 minutes (interquartile range 16-32). Patients undergoing radical nephrectomy had a greater decline in renal function at 3, 12, and 24 months postoperatively with the mean eGFR at 3 months being 15 mL/min/1.73m² lower than those undergoing partial nephrectomy (p<0.01). A lower preoperative eGFR and increasing age were also associated with a greater decline in renal function postoperatively (p<0.01). Among patients undergoing partial nephrectomy, ischemia type, ischemia duration, and tumour size were not predictive of postoperative decline in eGFR at 3, 12, and 24 months postoperatively (p<0.05).

Conclusions: Radical nephrectomy is associated with a greater decline in renal function compared with partial nephrectomy. In this modern cohort of patients, tumour size, ischemia type, and ischemia duration were not predictive of renal functional outcomes.

POD-01.03

Recurrence and Survival after Partial versus Radical Nephrectomy for T1 Renal Mass

<u>Forbes, Connor M.</u>¹; Rendon, Ricardo¹; Finelli, Antonio²; Kapoor, Anil³; Moore, Ronald⁴; Breau, Rodney⁵; Lacombe, Louis⁶; Kawakami, Jun⁷; Drachenberg, Darrel⁸; Pautler, Stephen⁹; Liu, Zhihui¹⁰; Tanguay, Simon¹⁰; Black, Peter¹¹

¹Dalhousie University, Halifax, NS, Canada; ²University of Toronto, Toronto, ON, Canada; ³McMaster University, Hamilton, ON, Canada; ⁴University of Alberta, Edmonton, AB, Canada; ⁵Division of Urology, University of Ottawa, Ottawa Hospital Research Institute, Ottawa, ON, Canada; ⁶Centre de recherche clinique et évaluative en oncologie, Centre Hospitalier Universitaire de Québec - Hotel-Dieu de Québec, Quebec, QC, Canada; ⁷Southern Alberta Institute of Urology, Calgary, AB, Canada; ⁸University of Manitoba, Winnipeg, MB, Canada; ⁹Western University, London, ON, Canada; ¹⁰McGill University, Montreal, QC, Canada; ¹¹University of British Columbia, Vancouver, BC, Canada

Introduction and Objectives: Partial nephrectomy for early stage renal cancer preserves renal function better than radical nephrectomy and is

generally considered oncologically sound. The Intergroup EORTC prospective randomized phase 3 trial comparing oncologic outcomes after partial versus radical nephrectomy, however, has cast some doubt on this premise. This study aims to elucidate outcomes in partial versus radical nephrectomy for early stage tumours in the Canadian population.

Methods: From 1989 to 2013, 1065 patients with a first occurrence of a clinical T1 renal mass who underwent partial or radical nephrectomy were identified from the Canadian Kidney Cancer Information System (CKCis), a national database of 2927 renal cancer patients. Baseline clinical, surgical, and pathologic parameters were collected. Progression-free survival was compared between types of surgery using a Cox proportional hazards model, adjusted for age at diagnosis, gender, clinical T stage, and diagnosis year.

Results: Inclusion criteria were met by 726 partial and 339 radical nephrectomy patients, with median follow-up of 2.7 and 3.8 years, respectively. Preoperative characteristics, surgical parameters and pathologic findings were similar in both groups, although patients undergoing radical nephrectomy more commonly had T1b disease (54% vs. 20%). Unadjusted Kaplan-Meier progression-free survival was lower in radical than partial nephrectomy (log rank test, p=0.04). However, in the multivariable analysis, time to progression did not differ between radical and partial nephrectomy (hazard ratio 1.63, p=0.12, 95% C.I. 0.88 -3.0).

Conclusions: These results indicate that progression-free survival does not differ between radical and partial nephrectomy in patients with T1 renal masses. This suggests that the selection of surgical approach should be based on other factors, including technical feasibility, potential complications and preservation of renal function.

POD-01.04

Analysis of Renal Cell Carcinoma Recurrence and Mortality in a Population-based Cohort of Surgical Patients from Nova Scotia Marzouk, Karim¹; Moideen, Nikitha²; Thompson, Kara²; Wood, Lori²

¹Department of Urology, Dalhousie University, Halifax, NS, Canada; ²Department of Medicine, Dalhousie University, Halifax, NS, Canada **Background:** The goal of this study was to determine the recurrence/ mortality rates, as well as identify significant clinical and pathological characteristics associated with Renal Cell Carcinoma (RCC) recurrence in a modern day population based cohort of patients treated for cure.

Methods: This is a population-based study that identified all patients undergoing curative-intent surgery for RCC between 2006 and 2010 in mainland Nova Scotia (NS). Patients were identified through Cancer Care NS, and study approval was obtained at appropriate REBs. The primary outcome was the incidence of postoperative RCC recurrences in this cohort. Data collection included baseline demographics, type of surgery, pathology characteristics, how recurrences were detected and location of recurrences. Using a multivariate regression analysis we analyzed the significance of these variables within the recurrence and non-recurrence populations. Patient mortality was evaluated as a secondary outcome.

Results: 547 patients make up the study cohort. We identified 61 (11%) recurrences, 68 deaths (12%) and 96 (18%) recurrences or deaths. Recurrences were detected by routine imaging in 57% of patients and symptoms in 21%. 42% of patients recurred in only one organ. Of those that recurred, 31% had initial stage 1, 25% stage 2, and 44% stage 3 RCC (p<0.0001). Clear cell pathology accounted for 75% of the entire cohort, and 85% of the recurrences. Preliminary univariate analysis revealed that sarcomatoid differentiation, tumour necrosis and grade 3&4 pathology were associated with significantly higher recurrence rates, p<0.0001, p<0.0001 and p<0.0001 respectively. Among patients with recurrent disease, 89% had undergone radical nephrectomies versus 10% partial nephrectomies (p<0.0001). The median time to progression from day of surgery was 1.1 years.

Conclusions: In our cohort of NS patients operated on between 2006 and 2010, the recurrence rate was 11%. With further follow-up, this number will increase. Most recurrences were identified from routine imaging. The highest risk of relapse was shown for patients having undergone radical nephrectomies for stage 3 clear cell RCC, with positive pathology for sarcomatoid differentiation, tumour necrosis and grade 3&4 disease.

POD-01.05

Renal Angiomyolipomas Do not Require Intensive Follow-up or Intervention: A Study of Their Natural History

<u>Bhatt, Jaimin</u>; Kim, Nicole; Manickavachagam, Karthikeyan; Evans, Andrew; Pei, York; Legere, Laura; Jhaveri, Kartik; Finelli, Antonio; Jewett, Michael

University of Toronto, University Health Network, Princess Margaret Hospital, Toronto, ON, Canada

Introduction: Renal angiomyolipomas (AMLs) are largely benign vascular tumours associated with constitutive activation of mTOR pathways. Genetic forms occur in Tuberous Sclerosis (TS) complex. The true natural history of AMLs is unknown. We hypothesize that most sporadic AMLs grow slowly and do not require intensive follow-u[or intervention.

Methods: Using a unique web-crawler application (Montage), all radiology reports in our institution between 2002 and 2013 were searched for renal AMLs. Patient demographics, initial tumour size, progression and association with TS/ intervention were analysed.

Results: A total of 2741 patients were reported with renal AML, of which we focussed on 574 lesions in 444 patients with 3 or more images (median follow-up 3.4 years [0.3-12]). Median age for entire group was 58 years. Female preponderance was >80%. Vast majority presented as asymptomatic (>90%) and <4 cm (89.9%). Intervention rate was 5.4% for whole cohort. Lesions under 4 cm grew at mean 0.020cm/year while >4cm grew at mean 0.020 cm/year (p=0.68). Vast majority of tumours were static with only 2.6% growing >0.5 cm/year. TS was confirmed in 17 cases (3.8%). TS cases presented younger (median age 27), with more symptoms than sporadic (41% compared to 7.5%), larger tumours at baseline (median 5.5 cm cv 1 cm, p<0.0001) and needed more intervention (29.4% cv 4%, p=0.0008). Most TS cases had >1 lesion.

Conclusions: This is the world's largest series of renal AMLs. We confirm that majority of AMLs are slow growing and don't require intensive follow-up/intervention. Patients presenting at younger age, with large/symptomatic tumours or with >1 lesion should be offered genetic testing for TS. Patients with TS should be followed up more regularly and offered targeted therapy/intervention in event of progression. We recommend further research into patients with higher growth rates to help identify genomic or phenotypic markers which can personalize surveillance strategies.

POD-01.06

Canadian Experience of Multicentre Uptake of Renal Tumour Biopsies for Small Renal Masses

<u>Bhatt, Jaimin</u>¹; Kapoor, Anil²; Tanguay, Simon³; Rendon, Ricardo⁴; Lacombe, Louis⁵; Black, Peter⁶; Pautler, Stephen⁷; Breau, Rodney⁸; Moore, Ronald⁹; Jewett, Michael¹; Finelli, Antonio¹

¹University of Toronto, University Health Network, Princess Margaret Hospital, Toronto, ON, Canada; ²St. Joseph's Healthcare Hamilton, Hamilton, ON, Canada; ³McGill University, Montreal, QC, Canada; ⁴Capital Health, Halifax, NS, Canada; ⁵Centre Hospitalier Universitaire de Québec, Quebec, QC, Canada; ⁶University of British Columbia, Vancouver, BC, Canada; ⁷Western University, London, ON, Canada; ⁸Ottawa Hospital, Ottawa, ON, Canada; ⁹University of Alberta, Edmonton, AB, Canada

Introduction: Renal tumour biopsy (RTB) has become increasingly important in management of small renal mass (SRM) recently. We evaluate uptake of RTB across Canadian centres using Canadian Kidney Cancer Information System (CKCis) - a centralized database of kidney tumour patients.

Methods: Review of CKCis database on RTB recorded from 6 provinces across Canada. The database was started in 2011 and preceding data entered retrospectively. We analysed diagnostic rates, histological sub-type, tumour grade specifically in clinical T1a tumours and determined concordance rates compared with surgical pathology.

Results: Of 2927 patients and 882 biopsies recorded on CKCis database, 616 were RTBs of 552 patients between 1994 and 2013. There was a significant increase in the uptake of RTBs (15% in 2010, 22% in 2011, 29% in 2012 and 42% in 2013). Ninety percent had 1 biopsy, while 10% had 2. Of 470 patients with recorded T-stage, 259 (55%) were cT1a tumours.

For cT1a sub-group of 259 patients, a diagnosis was available in 236 or 91%. Of these, malignant diagnosis was made in 80.5% while 19.5% were benign. Histological subtype was available in 88% of diagnostic biopsies (208/236) with 190 malignant (117 conventional clear cell, 44 papillary and 29 chromophobe) and 18 benign (2 angiomyolipoma and 16 oncocytoma). Grade was reported in 67% of malignant cases. Of 259 cT1a tumours, 116 underwent surgery with partial nephrectomy in 78% and radical nephrectomy in 22%. Of lesions recorded with final surgical pathology, malignancy concordance rate was 100%. Histological

subtype concordance rates varied at 80% to 85%. Grade concordance was lower at 65%.

Conclusions: Our findings confirm an increased uptake of RTB in diagnosis of SRMs of <4 cm with excellent diagnostic rates and malignancy concordance rates. There is however need to improve histological subtype and grade concordance rates as centres increase their uptake of RTB with opportunity for increased experience and knowledge transfer.