



## Platinum Priority – Editorial

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# Needle Tract Seeding Following Renal Tumor Biopsy: Scarcely a Concern or a Concern to Scare?

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Renal tumor biopsy (RTB) was historically reserved for specific indications due to concerns regarding accuracy and safety [1]. However, with the rising incidence of incidentally detected renal tumors, especially small renal masses (SRMs;  $\leq 4$  cm), there is a newfound interest in RTB [1,2]. The high rate of benign SRMs (20%), an inability of current imaging modalities to accurately distinguish benign from malignant lesions or provide information regarding the metastatic potential of malignant tumors, along with an interest in nonsurgical management of SRMs (active surveillance [AS] and ablative therapies) have resulted in growing popularity of RTB in clinical practice [1,3,4].

RTB is a safe and useful tool to inform renal tumor management [1,5]. Several large series from centers of excellence have reported on the safety and accuracy of RTB [3,4,6–9]. Marconi et al. [10] in a systematic review and meta-analysis of safety and accuracy of RTB reported an overall diagnostic rate of 92%, with accurate identification of renal cell carcinoma (RCC) histologic subtype and fair agreement between tumor grade at biopsy and surgery. The overall rate of complications, mostly minor complications, was 8.1%. The largest series to date, a 13-yr experience from the University Health Network (UHN), was published by Richard et al. [9]. The overall diagnostic rate of RTB was 94%, and histology and nuclear grade were highly concordant with final surgical pathology in those who underwent surgery (93% and 94%, respectively) [9]. The overall complication rate in the UHN cohort was 8.5%, with the majority of complications being graded as Clavien grade 1. After a median follow-up time of 28 mo (interquartile range: 11–53), no needle tract seeding had been reported

[9]. In a recent report by Richard et al. [11], the safety, reliability, and accuracy of RTB from a multi-institutional registry were reported. Once again, the overall diagnostic rate of RTB was 91%, and there was a high concordance rate between RTB histology and nuclear grade (high or low) with surgical pathology (86% and 81%, respectively). No needle tract seeding was reported [11].

In this month's issue of *European Urology*, Macklin et al. [12] reported on a case series of patients with biopsy tract seeding following RTB for T1 renal tumors between January 2014 and November 2017. Only two of 173 patients having undergone RTB at the author's institution and remaining five referred from other centers (for surgical management) were found to have needle tract seeding. All patients underwent partial nephrectomy, and six were found to have an upstaging to pT3a due to the presence of tumors along the biopsy tract. Six were papillary RCCs and one was clear cell RCC. Biopsies were performed with an 18G needle with a coaxial technique in six patients (data were not available for one patient). On histologic examination, four patients demonstrated a clear macroscopic feature suggestive of tumor seeding (area of fat necrosis or hemorrhage within the perinephric fat). One patient with concurrent renal sinus fat invasion, positive surgical margin, and biopsy tract seeding subsequently developed local recurrence of the tumor within the renal bed. No data on accidental tumor incision/tumor spillage were provided.

Before assessing and addressing the implications of this series, a few issues should be highlighted. National Health Service in the UK provides centralized care, and major operations are offered at certain centers. While authors report on seven patients, only two (out of 173) with

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proposed biopsy tract seeding had biopsies done at the authors' center. The true number of total RTBs performed is not available (the denominator). Hence, beyond the data presented on these two cases, the significance of the remaining five patients is of limited value considering that no data on biopsy indication, tumor complexity and location (RENAL and PADUA score; challenging biopsy), experience of radiologist(s) and institutions involved, as well as surgical technique used (enucleation, enucleoresection, and wedge resection) and possible surgical complications (accidental tumor incision/tumor spillage) are presented by the authors. Only one patient had evidence of a clinical recurrence in what appeared to be needle tract seeding, and this was in a patient with a positive surgical margin who also had recurrence in the renal bed, leaving open the possibility that the recurrence along the tract may have been due to spillage/contamination during surgery.

Large published series from centers of excellence have shown tumor size, tumor type (cystic vs solid), and tumor location (exophytic vs endophytic) are predictors of successful biopsy and complications [3–5,9]. Complete resection of cancer without spillage is an oncologic principle. While a positive surgical margin is known to be associated with a significantly higher risk of local recurrence [13], accidental tumor incision/spillage is shown to be associated with the risk of tumor seeding and local recurrence [14]. Tumor incision/spillage is likely a more detrimental factor than biopsy tract seeding toward a risk of local recurrence. Pathologic upstaging to pT3 disease occurs in 9% of cT1 tumors and is known to be associated with age, tumor size, Fuhrman grade, RCC subtype, and positive margin [15]. These variables may also explain the upstaging seen in this case series besides the biopsy tract seeding.

Although biopsy tract seeding has long been a concern of RTB, the improvements in imaging technique and modality as well as the use of coaxial biopsy technique are suggested to be the main reasons for the rarity of such an event [1,4,10]. In the meta-analysis by Marconi et al. [10], 37 studies reported on the complications associated with RTB (including biopsy tract seeding). Just over 3900 patients were included, and only one case of biopsy tract seeding was reported. This extremely low rate of biopsy tract seeding is reproduced by contemporary large RTB series, reporting no such event [8,9,11]. AS of SRMs has been adopted as a management option [16,17], and a number of patients managed by AS are highly encouraged to undergo RTB prior to embarking on this strategy. Based on currently available AS series, no significant difference between AS and surgical intervention (radical or partial nephrectomy) in regard to risk of local progression, progression to metastases, or disease-specific mortality exists between patients having RTB and those who did not [18].

The report from Macklin et al. [12] is intriguing and will lead to more debate among urologists and radiologists regarding the safety of RTB [11]. However, before cautioning about the risk of biopsy tract seeding and preaching a change in practice pattern, one should cautiously examine the available data and balance the risk and benefits associated with RTB. RTB is shown to be a clinically valuable tool in

diagnosing benign pathology and hence avoiding the known risks associated with surgical intervention [19]. It also informs a treatment plan (AS, partial nephrectomy, or radical nephrectomy) in patients harboring RCC. Reports on large series from centers of excellence with dedicated interventional radiologists and genitourinary pathologists have consistently shown safety and accuracy of RTB with extremely low rates of biopsy tract seeding. When assessing the biopsy tract for the presence of tumor (seeding), one should consider the surgical technique (enucleation), tumor type (papillary), tumor grade (high grade), and tumor size, which are known to be associated with a higher positive surgical margin rate, risk of upstaging, and presence of tumor beyond the pseudocapsule.

It is particularly important to emphasize that the risk of biopsy tract seeding in patients harboring RCC is extremely low and, more importantly, is likely to be subclinical. Extrapolating from AS and ablative therapy series, one may assume that even if RTB is associated with biopsy tract seeding in rare instances, such events are of limited clinical significance, since neither AS nor ablative therapies have been shown to be associated with a higher risk of local progression, progression to metastases, or disease-specific mortality. In summary, we believe that RTB has an ever-increasing role as a decision aid in treatment planning for renal tumors, especially SRMs. Its use should not be deterred by preliminary isolated reports that demonstrate concerning pathologic findings in very rare cases, which may or may not carry clinical significance. In other words, unless more robust data emerge, there is scarcely a concern to scare.

**Conflicts of interest:** The authors have nothing to disclose.

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