

## Oncology

## Endoscopic ultrasound-guided trans-duodenal biopsy of a renal mass: Case report and literature review

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## ABSTRACT

The importance of histologic characterization of renal masses is increasing in the management of small renal tumors and metastatic settings of renal cell carcinoma (RCC). Tissue sampling of renal lesions is generally achieved through a percutaneous approach yet endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) with cytological analysis could be more suitable in selected circumstances. We report a case of endoscopic ultrasound-guided fine-needle biopsy (EUS-FNB) of an anterior, mesorenal right kidney mass with a thrombus extending into the right atrium, unreachable via a percutaneous approach.

## Introduction

Percutaneous renal biopsy (PRB) is an established approach for diagnosis and subsequent treatment of medical renal diseases. It is an option in case of small renal tumors (<4 cm) amenable to active surveillance in patients who are unfit for surgery or in case of metastatic disease for histological characterization, considering the different response to target therapy of the various RCC subtypes. Ultrasound-guided PRB is the standard technique to sample renal lesions, although it may not be feasible in case of anatomical limitations such as obesity, high location of the kidney, central or an anterior mass and when skin-to-tumor distance is more than 13 cm. An alternative approach for tissue sampling of renal lesions is EUS-FNA, but few cases have been described so far and its role in the diagnostic process of renal carcinoma has yet to be defined. We report a case of EUS-FNB of an anterior, mesorenal locally advanced tumor of the right kidney with a level IV thrombus extension, according to Neves and Zincke system.

## Case presentation

An 84-year old Caucasian man was referred to our clinic for a 6 cm right renal tumor, discovered after evaluation of tachycardia. Whole body contrast-enhanced computer tomography (CT) scan revealed a solid, round, hypervascular right renal mass, suggestive of RCC. The tumor extended as thrombus into the right atrium. CT scan was negative

for secondary lesions (Fig. 1). Given the age and the high anesthesiological risk, the patient was defined unfit for radical surgery, systemic therapy was planned and PRB was considered. Percutaneous approach was not suitable due to the upper and anterior location of the renal mass. Considering the close position between the mass and the descending duodenum, EUS-FNB was assessed. Anticoagulation was stopped according to cardiological consultations. The procedure was performed under sedation with intravenous propofol, with a loading dose of 40 mg. Further smaller bolus (10 mg) were used to maintain sedation. The patient was placed in left lateral decubitus and the biopsy was performed by an expert endoscopist using a linear array echoendoscope (Premier Ultrasound Processor-ProSound F75- Olympus) and a 22 G needle. The echoendoscope was pushed forward to the duodenum and the renal mass was detected at the level of the second duodenum portion. No interposed anatomical structures were identified between the duodenum wall and the biopsy target. Color Doppler ultrasound allowed avoiding major blood vessels during biopsy. The operator used a two passes with stylet slow-pull technique and a one pass with suction until three suitable specimens were obtained (Fig. 2). Total length of the three histological samples was 1.5 cm. The biopsy site was monitored for 10 minutes to rule out active bleeding. The procedure lasted 40 minutes. The postoperative course was uneventful and the patient was discharged 3 hours later. Pathology report was diagnostic for poorly differentiated RCC (Fig. 3). The patient was subsequently referred to a medical oncologist.

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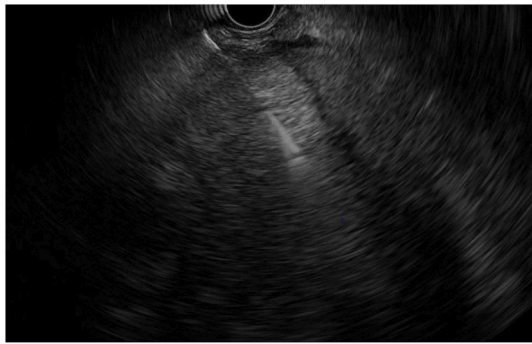
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**Fig. 1.** CT scans of the kidney mass, showing the thrombus extended into the right atrium. Axial (a), Coronal (b) and Sagittal (c) planes.



**Fig. 2.** Endoscopic ultrasound image of the needle sampling the renal mass.

## Discussion

The histological characterization of renal tumors has recently become a more needed practice, in both small renal tumors and metastatic settings of RCC. PRB is the standard for assessing unknown renal masses and is performed under ultrasound or CT-guidance. Both FNA and core biopsy (CB) are used to study renal masses, but it is still not clear if one is superior to the other. FNA is usually performed with a 21-gauge needle, while 18-gauge cores are obtained with biopsy.<sup>1</sup> The sample from CB maintains tissue architecture and provides a superior accuracy in characterizing histological subtype. A meta-analysis regarding diagnostic accuracy of percutaneous renal tumor biopsy demonstrates that CB is superior to FNA with a sensitivity and specificity of 99.1% and 99.7% versus 93.2% and 89.8%, respectively.<sup>2</sup> Despite improved biopsy techniques and the use of imaging guidance, PRB is not always feasible. Percutaneous approach is achievable in posterior renal masses but could be challenging for centrally and anteriorly located tumors, in the upper or mid-pole; for upper pole masses an alternative could be a transhepatic approach. EUS-FNA has been described as a safe and successful technique for the diagnosis of lesions arising from the liver, pancreas or otherwise every mass accessible from the upper gastrointestinal (GI) tract. The anatomical relationship between upper GI tract and both kidneys allows the sampling of renal masses. The right

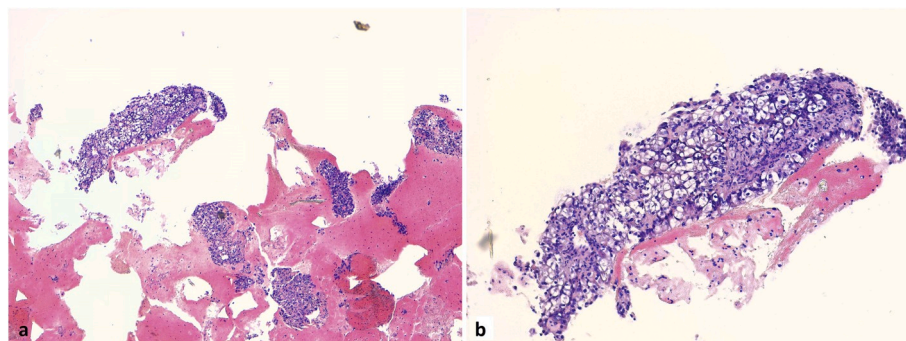
kidney may be reached by placing the endoscopic ultrasound probe in the descending part of the duodenum, while the left kidney could be reached with the instrument located in the stomach body. EUS-FNA of renal masses is an uncommon procedure and there have been few studies reported so far. A 22-gauge needle was used in all those studies to obtain cytological analysis, with good results and minimal complications. Farrel and Brugge first described EUS-FNA for the diagnosis of primary RCC in a patient with a middle renal mass and multiple pancreatic cysts.<sup>3</sup> Other case reports and two retrospective studies demonstrated the safety and feasibility of the procedure.<sup>4,5</sup> The technical success rate was of 100% for the reported cases. In the study by Moura et al. the technical success rate of EUS-FNA was 90% with one failed sampling of a small posterior renal mass.<sup>4</sup> DeWitt found a sensitivity of 83% for the diagnosis of RCC (one patient had a histopathological result of RCC from the surgical resection despite a cytological diagnosis of oncocytoma).<sup>5</sup> The small amount of cells sampled by a needle aspiration may not be sufficient for a diagnosis and may not distinguish between benign lesions and low-grade cancer, therefore a CB is preferred for histologic characterization and immunophenotypization. Conversely, the needle we used for biopsy during EUS procedure was a cobalt chromium 22-gauge needle with three symmetrical cutting heels. This needle is specifically designed to biopsy a larger tissue sample. Indeed, we were able to collect three cores which had a good tissue architecture and were diagnostic.

## Conclusion

Our case report demonstrated that EUS-FNB is a feasible and safe approach to provide excellent and diagnostic tissue sample for pathological examination of renal masses, which are not suitable for PRB.

## Declaration of competing interest

None.



**Fig. 3.** Biopsy sample of clear cell renal cell carcinoma (a) and detail of the tumor tissue (b).

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