Adrenal Lesion Core Biopsy: A New Approach and an Incidental Benefit

Kim Smith*

Radiology SA Central Districts, Australia

Abstract
A 79-year-old male with a history of renal cell carcinoma was referred for CT guided core biopsy of a right sided 3 cm adrenal lesion. A number of vulnerable anatomical structures were adjacent to the lesion, so an innovative positioning technique was used to maximize access to the lesion and minimize risk to the adjacent structures. The head down position used in this case resulted in the liver and portal vein moving superiorly, significantly reducing the likelihood of injury. This case study briefly discusses the pathologies and diagnoses of adrenal lesions and explains the value of the unique approach used.

Keywords
Adrenal, Biopsy, Vena cava

Summary of the Reviewed Literature
In a group of 87065 autopsies, 6% revealed incidental adrenal lesions [1,2]. A wide variety of methods are currently used to assess lesions of the adrenal gland, a review of the current literature provides excellent description of these techniques.

There are well established criteria for deciding whether adrenal lesion biopsy is appropriate.

In patients with a history of a prior extra adrenal neoplasm, 50-75% of adrenal lesions seen are malignant [3,4]. This is in stark contrast to the statistics for lesions in patients with no prior cancer history. Incidentally found adrenal lesions in otherwise well patients are often benign adrenal adenoma [5]. Only 6% of lesions less than 4 cm in diameter prove neoplastic with that number increasing to 25% in lesions measuring 4-6 cm [5]. In view of these values, adrenal lesions measuring 4 cm or less are not typically biopsied.

In the absence of a cancer history, a non-contrast CT of the adrenal glands is the accepted practice in our organization. Benign adrenal adenoma is the most common finding [6]. Adrenal adenoma is seen as a discrete lesion of relatively uniform density with an average Hounsfield Units (HU) value of 10 or less. Lesions fitting this description are considered low risk and are managed conservatively. Lesions of higher density require more vigorous investigation, especially those which are rapidly growing or greater than 6 cm in diameter. In particular, lesions with irregular contours are suspicious of malignancy and can further be characterized through a multiphasic CT examination. Due to the risk of hypertensive crisis in pheochromocytoma, evaluation of the lesion prior to biopsy is advised.

Equipment
Siemens Definition 64 CT scanner installed in May 2010. A 30 cm transparent ruler and non-alcohol soluble marker.

A 10 ml syringe filled with 10 ml normal saline solution and fitted with a 23 g × 38 mm needle for washing samples from the core needle. Sterile, disposable trolley drape, fenestrated drape, gloves and surgical gown. Dressing tray with gauze, 10 ml syringe, 18 g blunt drawing up needle, scalpel and pathology sample pot containing formalin. 2% solution of Chlorhexidine in 70% alcohol as skin antiseptic. 15 ml Xylocaine 1% solution administered via a 50 mm × 22 g needle as local anaesthetic. 10 cm × 17 g biopsy introducer needle with a 15 cm × 18 g core biopsy needle inserted coaxially.

Technique
Following an explanation of the procedure to the patient, signed consent was obtained once no contraindications were established.

The patient was positioned prone on the CT table with three pillows under the pelvis and a long triangular pad under the ankles to relieve stress on the feet. Padding for the shoul-
Discussion

The simple but effective positioning technique used in this case has not been described in the articles reviewed, and may prove useful in other cases.

The subject of this case had his right kidney resected for renal cell carcinoma, so despite the 3 cm diameter of the adrenal gland lesion, a biopsy was appropriate. The referring physician did not have concerns that the lesion was a pheochromocytoma, so the requested biopsy proceeded.

Anatomically the right adrenal gland is adjacent to the inferior part of the right lung posteriorly, liver laterally, spine medially and inferior vena cava anteriorly. This position limits the opportunities available for low risk access for percutaneous biopsy. Previous diagnostic CT examination of this patient also showed the portal vein abutting the anterior surface of the lesion (Figure 1). Following discussion with the performing radiologist, the patient was positioned prone with three pillows elevating the pelvis. This resulted in a “head down” angle at the biopsy site which was designed to afford access to the lesion while avoiding the posterior diaphragm. Expiratory arrested respiration aided in this effort during imaging and needle manipulation.

In addition to the risk of injury while approaching the biopsy site, there is potential for injury if the needle traverses the lesion entirely. The head down position used in this case resulted in the liver and portal vein moving superiorly, significantly reducing the chance of injury. As an incidental benefit, the inferior vena cava was seen to be less than half the diameter seen in the previous supine imaging due to a drop in the abdominal venous pressure in this position (Figure 2 and Figure 3). The post procedure chest X-ray (Figure 4) showed
no pneumothorax to indicate diaphragmatic or pleural injury.

The pathology report of the tissue sampled was in keeping with the current literature. Clear cell proliferation of metastatic renal cell carcinoma, World Health Organisation Grade 1 was found.

**Conclusion**

The criteria for adrenal lesion fine needle aspiration (FNA) or core biopsy are well established and were clearly met in this case. A beneficial result with minimal risk to the patient was obtained through careful positioning and technique. The incidental benefit of the position used contributed to the safety of the procedure by minimizing the diameter of the adjacent Vena Cava. This position was not found in a search of previously published material and may be of significant value in future cases.

**References**


**Figure 3**: Procedure scan. White arrow indicates region of previously distended Vena Cava and the coring needle is seen in the adrenal mass.

**Figure 4**: Post procedure chest radiograph. No evidence of injury.

**Figure 4**

**Figure 4**: Post procedure chest radiograph. No evidence of injury.