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Is Endoscopic Ultrasonography-Guided Fine Needle Aspiration Trailblazing in Tissue Sampling of Adrenal Masses?

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See "Endoscopic Ultrasound-Guided Fine-Needle Aspiration of the Adrenal Glands: Analysis of 21 Patients" by Rajesh Puri, Ragesh Babu Thandassery, Narendra S. Choudhary, et al., on page 158-164.

Recent developments in imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI) have led to increased detection of adrenal tumors.[1] Most incidentally discovered adrenal masses are biochemically non-functioning, and only 2% are metastases from various cancers. Approximately 75% of adrenal masses that are found during the staging of patients with cancer are metastases from melanomas, carcinomas of the lung and breast, renal cell carcinomas, or lymphomas.[2] Current imaging methods cannot sufficiently differentiate benign from malignant masses. Therefore, ultrasonography- or CT-guided fine needle aspiration (FNA) have traditionally been used for tissue sampling of the adrenal glands.[3] Recently, with the emergence of endoscopic ultrasonography (EUS) and accessories, EUS-guided FNA has been used for adrenal gland biopsy.

Eloubeidi et al.[4] reported that the false-positive rates of diagnosis of CT and MRI were 21% and 50%, respectively, meaning that a benign lesion was classified as a metastasis. Recently, positron emission tomography (PET) has been used to predict adrenal gland metastasis in patients with lung cancer. A systematic analysis by Stone et al.[5] showed that although PET had high sensitivity and specificity for malignant adrenal masses in patients with lung cancer, adrenal biopsy was recommended for confirming the imaging findings. However, adverse events related to percutaneous adrenal biopsies included hemorrhage, pneumothorax, septicemia, pancreatitis, and rarely, needle-tract seeding.[6] We need to establish a new methodology for tissue sampling of adrenal masses in patients with lung cancer. EUS-guided FNA, which has few adverse events, may be better than percutaneous biopsies.

On EUS imaging, a normal adrenal gland hasa seagull shape. Complete evaluation of the right adrenal gland is more technically challenging than the left adrenal gland. For example, one study reported that the right adrenal gland could be visualized by EUS in 87.3% of patients, whereas the left was visualized in all of the patients.[7] In this particular report, tuberculosis of the adrenal gland showed low echoic features with or without necrotic foci compared with other causes, and metastatic lesions displayed variable shapes such as enlargement of one limb or focal nodules.[8] Interestingly, no radiological evidence of tuberculosis was found in other sites among the patients. However, alterations in the shape of the adrenal gland with focal lesions and enlargement of only one limb were observed. Eloubeidi et al.[4] reported that EUS had an accuracy of 68% when used to distinguish benign from malignant masses based on size (≥30 mm). Therefore, the shape and size of a mass on EUS could not be used to accurately classify abnormal lesions of the adrenal glands.

The application of EUS-FNA for obtaining adrenal gland tissue is controversial. The first application of EUS and EUS-FNA to evaluate the adrenal gland was published by Chang et al.[9] in 1996. In this report, the left adrenal gland was observed by EUS in 97% of the patients and EUS-FNA was performed in one patient with a left adrenal mass. Uemura et al.[7] reported that the accuracy of EUS/EUS-FNA for the diagnosis of adrenal metastasis was higher than that of CT and PET-CT (100%, 96%, and 97.0%, respectively). Another study reported that the sensitivity, specificity, positive predictive value, and negative predictive value of EUS-FNA were 86%, 97%, 96%, and 89%, respectively, for the diagnosis of malignant adrenal gland lesions.[10]

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In this study, EUS-guided FNA could obtain adequate tissue from the adrenal glands in all 21 patients.[8] This study showed that 10 patients with tuberculosis were diagnosed by the presence of caseating granulomas (*n*=10) and acid-fast bacillus (*n*=4), and histoplasmosis and metastatic lesions were confirmed on histological examination in two and nine patients, respectively. The non-diagnostic rate with a percutaneous approach was up to 14% and was associated with adverse events in 0.4% to 12% of patients.[11,12] The non-diagnostic rates with EUS-guided FNA were 0% in four articles and 10% in one article.[4,7,10,13,14] Due to the close proximity of the glands to the echoendoscope and real-time US-guided needle puncture, EUS-guided FNA is advantageous for obtaining tissue from both of the adrenal glands. In addition, EUS-guided FNA can be performed simultaneously with staging EUS if a lesion is detected.

The authors reported no adverse events related to these procedures, consistent with other studies.[4,7,10,13,14] Based on these previous reports, adrenal gland EUS-FNA was considered to be a safe and minimally invasive procedure. However, most studies to date have included patients with underlying malignancies, and most did not undergo follow-up imaging for benign lesions. However, pheochromocytoma should be as a differential diagnosis when evaluating whether to use EUS-guided FNA for patients without clinically diagnosed or suspected malignancies. Image-guided needle puncture may lead to the sudden release of catecholamines and subsequently to a life-threatening adrenal hypertensive crisis.[15]

Although only a small number of patients were enrolled in this study, the authors presented the effectiveness and safety of EUS-FNA in patients with both malignant and benign adrenal lesions. Interestingly, the diagnosis of tuberculosis and histoplasmosis of the adrenal glands in patients with fevers of unknown origin was made by using EUS-FNA. Well-designed prospective studies must be performed to determine when EUS-FNA should be performed for patients with adrenal lesions. The left adrenal gland was best visualized by EUS and could easily be sampled from the stomach by using EUS-guided FNA. However, the right adrenal gland was less visible than the left when using this technique. Since EUS-guided FNA is a safe procedure with excellent diagnostic rate, it will influence the treatment decisions for patients with adrenal gland masses or enlargement.

Conflicts of Interest

The author has no financial conflicts of interest.

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