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ORIGINAL ARTICLE

Cytopathologist-performed ultrasonography-guided fine-needle aspiration of head and neck lesions: the Weill Cornell experience

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Introduction Ultrasonography-guided fine-needle aspiration (US-FNA) yields diagnostic material more often than palpation-guided FNA does. It is often performed by an interventional radiologist (IR) but rarely by a cytopathologist (CP). Herein we describe our method of performance and growing experience with this technique.

Materials and methods Data from US-FNA of head and neck lesions performed over a 33-month period by both a CP and an IR were reviewed. Special attention was paid to cases for which histologic follow-up was available. Association in concordance between cytologic and histologic diagnoses was attempted using Fisher's exact test. Mean size of masses biopsied, number of passes performed, and passes needed to achieve adequacy were compared between groups using the Wilcoxon rank-sum test. Tests were 2-sided with $P < 0.05$ regarded as statistically significant.

Results Of the 175 US-FNAs performed, 108 (62%) were done by the CP and 67 (38%) by the IR. Fifty-eight patients had histologic follow-up; 37 (64%) for the CP and 21 (36%) for the IR. Mean mass size was significantly smaller for the IR at 2.11 cm versus 2.9 cm for the CP ($P = 0.021$). Adequacy was achieved after 1 pass in 70% of cases (26 of 37) by the CP and 67% (14 of 21) by the IR. Number of passes performed did not vary

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significantly between groups. A variety of masses were biopsied; however, the small sample size precluded meaningful evaluation of cytologic concordance to final histology.

Conclusions CP-performed US-FNA has been successfully delivered to clinicians at our institution.

Introduction

Ultrasonography-guided fine-needle aspiration (US-FNA) is commonly used to biopsy masses involving head and neck organs because, in experienced hands, it allows for rapid triage and accurate diagnosis of patients with minimal risk when compared with open biopsy.[1] It is a valuable tool for targeting small masses and solid areas within cystic masses, thereby decreasing the likelihood of a nondiagnostic biopsy.[1] Based on cytologic diagnoses from US-FNA, patients are often triaged to more invasive diagnostic studies or undergo surgical resection. Previous literature has shown that, in capable hands and compared with palpation-guided fine-needle aspiration (PG-FNA), US-FNA shows reduced nondiagnostic biopsy rates (<10% versus 10%-20% for US-FNA and PG-FNA, respectively), improved sensitivity (86% versus 50%), and increased negative predictive value (100% versus 33%).[2-6] Moreover, performance of FNA by a well-trained and proficient cytopathologist (CP) has been shown to improve diagnostic accuracy when compared with performance by practitioners with less training and experience.[1,5,6]

With the wider availability and decreased cost of portable US machines, more CPs now perform this procedure. Evidence in the literature suggests that CP performance has a tendency to decrease overall cost and increase clinical utility of FNA.[3-5] CP performance of US-FNA is welcomed by clinicians as it allows for more rapid result transmission.[1,6-9] Specialized US-FNA training courses with certification are offered by several professional societies including the College of American Pathologists (CAP) and American College of Surgeons, allowing for greater participation by interested CPs.[6]

At our institution, the US-FNA service is staffed by a CP trained and certified by CAP in US-FNA, the cytopathology fellow (CF), and a cytotechnologist (CT). This study focuses on the expanded role of the CP-performed US-FNA and reviews our results to date. We also summarize the results obtained by our interventional radiology (IR) colleagues to place our results in context with the results obtained by the dominant practitioners of this technique.

Materials and methods

This study was approved by the institutional review board (IRB #1406015197). Computerized data from all US-FNAs of head and neck masses performed over a 33-month period (January 1, 2011−September 30, 2013) by the US-FNA service at the New York Presbyterian Hospital—Weill Cornell Medical College (NYPH-WCMC) was reviewed. Data from a community IR practice to which NYPH-WCMC surgeons sometimes refer patients was also reviewed. Masses underwent a standard diagnostic ultrasonography scan by a radiologist prior to being referred for CP-performed US-FNA. Sites biopsied included the thyroid gland, salivary glands, cervical lymph nodes, and other head and neck masses including cysts. Biopsied masses varied in terms of both palpability and US characteristics. Palpable lesions were biopsied using US to sample the most suspicious area and to avoid vascular and nerve structures.

Referral patterns

Biopsies were performed by a single CP who also performed the on-site adequacy evaluation of all samples obtained. The service responds to clinician requests for inpatient, emergency department, and outpatient diagnostic US-FNA biopsies. Clinicians referred patients in the following situations: (1) new patients with a US report indicating a head and neck nodule; (2) palpable head and neck nodules that required US-FNA to target the diagnostic area, such as a solid region within a predominantly cystic thyroid mass, or an area of calcifications; (3) a nodule located near vascular structures such as the carotid artery or jugular vein; (4) international or out-of-town patients who consulted a specific clinician; (5) an urgent diagnosis was needed for treatment or triage to more invasive studies; (6) intraoperative diagnosis if preoperative FNA was inconclusive; (7) postoperative monitoring of a suspicious mass.

Clinicians generally referred patients to the community IR-run practice in the following situations: (1) complete US assessment of head and neck organs when clinically suspicious; (2) previous nondiagnostic CP- or clinician-performed biopsy; (3) previous nondiagnostic PG-FNA; (4) provider preference for IR-performed studies; (5) patients requiring other imaging concurrently with the biopsy.

US-FNA technique

The training and technique used was similar to that described elsewhere.[1,10,11] For US, the CP used a portable Sonosite NanoMaxx System (Sonosite Inc, Bothell, Wash) with a flat, high-resolution linear transducer. To summarize our technique, a limited medical history was first obtained from the patient. Previous imaging reports, including any prior US studies, were reviewed. The target of interest was