ORIGINAL REPORTS

Instituting Ultrasound-Guided FNA for Thyroid Nodules into a General Surgery Residency Program: What We Learned

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BACKGROUND: Evaluation of a thyroid nodule is a common referral seen by surgeons and frequently requires ultrasound-guided fine needle aspiration (US-guided FNA). While surgical residents may have sufficient exposure to thyroid surgery, many lack exposure to office-based procedures, such as US-guided FNA. General surgery residents should be provided with knowledge and practical skills in the application of diagnostic and interventional neck ultrasound to manage the common workup of a thyroid nodule.

METHODS: This study sought to instruct and measure surgical residents' performance in thyroid US-guided FNA and evaluate their views regarding instituting such a formal curriculum. Twelve (n = 12) senior residents completed a written pretest and questionnaire, then watched an instructional video and practiced a simulated thyroid US-guided FNA on our created model. Then residents were evaluated while performing actual thyroid US-guided FNAs on patients in our clinic. Residents then completed the same written exam and questionnaire for objective measure.

RESULTS: Eight of the chief residents (62%) felt "not comfortable" with the procedure on the pre-course survey; this was reduced to 0% on the post-course survey. Moderate comfort level increased from 15% to 50% and extreme comfort increased from 0% to 8%. From the 11 residents who completed the pre- and post-test exam, 82% (n = 9) significantly improved their score through the curriculum (pre-test: 40.9 vs. post-test: 61.8; p = 0.05).

CONCLUSION: With focused instruction, residents are able to learn ultrasound-guided thyroid biopsy with improvement in subjective confidence level and objective measures. Resident feedback was positive and emphasized the importance of such training in surgical residency curriculum. (J Surg Ed ▮:▮▮▮-▮▮▮. Published by Elsevier Inc on behalf of the Association of Program Directors in Surgery)

KEY WORDS: fine needle aspiration, thyroid biopsy, curriculum, ultrasound, simulation

COMPETENCIES: Practice-Based Learning, Patient Care and Procedural Skills, Systems-Based Practice

INTRODUCTION

Thyroid disease remains an essential curriculum content area for general surgery residents and the prevalence of thyroid nodules has increased over the years due to advances in ultrasound (US) technology. With US the physician can evaluate the deep and sub-centimeter lesions, obtain sequential quantitative measurements, and perform fine-needle aspiration (FNA) in a more precise way. US-guided FNA (US-guided FNA) is widely practiced in-office by internists, endocrinologists, and surgeons to better gauge which thyroid nodules can be managed conservatively versus those in need of an operation. General surgery residents should be provided with knowledge and practical skills in the application of diagnostic and interventional neck US to manage the common workup of a thyroid nodule.

At our institution, during the last year of general surgery training, chief residents (PGY-5s) staff an endocrine surgery clinic under the supervision of a fellowship-trained endocrine surgeon. Most resident exposure for operating on the

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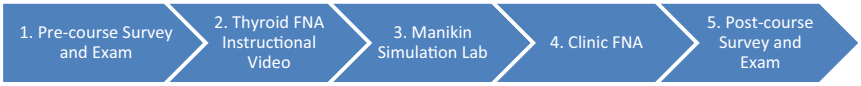

FIGURE 1. Steps taken to introduce our thyroid FNA curriculum.

thyroid, as well as perioperative management, occurs during this fifth-year rotation. Although our attending physician performs many US-guided FNAs in his private office, our chief resident clinic was not set up for US-guided FNA—the clinic staff was not properly trained and the clinic lacked the necessary equipment (US, Cytolyte, etc.) for the procedure. In the past, patients from our chief clinic who needed a thyroid biopsy were sent to radiology for the procedure, as compared to the "one-stop shopping" experience performed in the attending's private office, or as performed elsewhere in the community.

Suspecting a knowledge gap for our general surgery residency, a pre-study survey was administered to the residents. At our institution, 100% of our general surgery residents ($N = 31$) felt "uncomfortable" performing an US-guided FNA; however, 100% also selected that they would be interested in learning how to perform the procedure to improve endocrine surgery skills. Believing there to be great value in gaining residency experience for office-based US evaluations (breast, axillary, neck, etc.), we aimed to accomplish three things in this study: (1) Allow general surgery residents to learn an important skill while providing a convenient new service for our patients; (2) Measure resident safety and proficiency in performing US-guided FNA; and (3) Evaluate resident feedback regarding the experience, as well as the possibility of adding this to the general surgery curriculum.

METHODS

Following approval from Greenville Health Systems' Institutional Review Board all senior general surgery residents (seven PGY-4s and six PGY-5s) were consented for this prospective study, which began in August 2016 and ended in March 2017. A total of 13 residents were consented for the study, but, due to a scheduling conflict, 1 resident was unable to participate after completing the pre-course survey. Overall, 12 residents (six PGY-4s and six PGY-5s) were involved as study subjects.

The stepwise approach that each resident took in the study is listed in Figure 1. At the time of obtaining resident consent, all residents completed a pre-course 10-question multiple choice exam, as well as a 10-question survey (Appendices A and B). Participating residents were blinded to the exam scores and the answer key. Following pre-course exam and survey, residents were given a web link to a thyroid US course provided by the American Thyroid Association with basic instructions on evaluating thyroid nodules, performing FNA, and preparing pathology slides.[1]

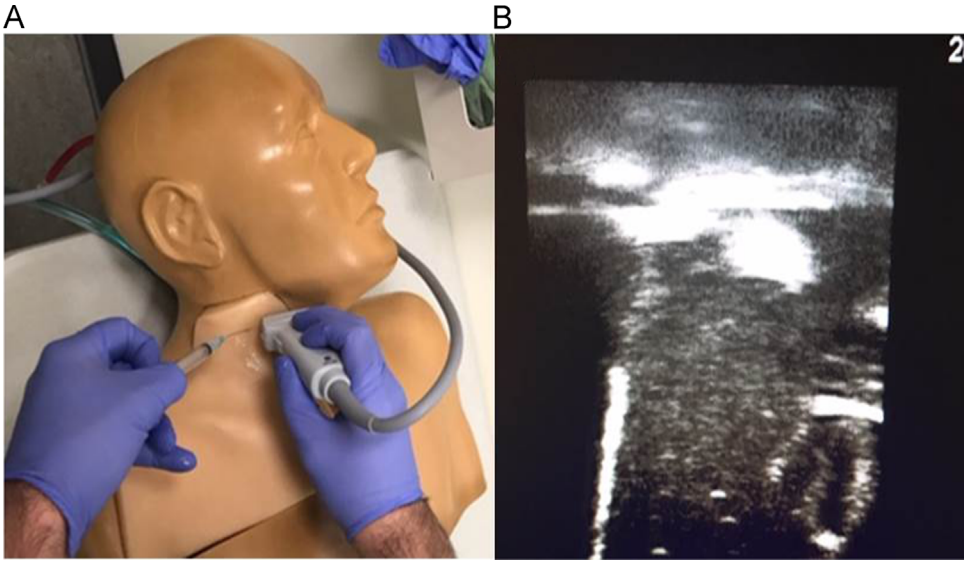

FIGURE 2. (A) Resident practicing FNA using our manikin with an olive inserted into the neck mold and (B) US screen showing the needle approaching the olive target.