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Ultrasound Education Curriculum Increases First Year Student Visualization Ability Three-Fold

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Ultrasound Education Curriculum Increases First Year Student Visualization Ability Three-Fold

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Introduction: Ultrasound usage in identifying a subsheath within the first dorsal extensor compartment may be useful in determining cortisone shot effectiveness in alleviating pain for DeQuervain's Tenosynovitis(1,2). However, no ultrasound educational curriculum has been established for non-radiologists(3-5). We hypothesize that an ultrasound training protocol will show marked improvement of anatomical knowledge and technical knowledge of how to utilize an ultrasound probe to visualize the first extensor compartment and any possible septation.

Materials & Methods: First-year medical students were polled for participation from a single medical school at a tertiary care academic medical center in the Midwest. Evaluations were developed and administered by an orthopedic research committee and attending radiologist and resident: a 10 question multiple choice quiz, a clinical visualization exam where students were asked to find the first extensor compartment using ultrasound, and a self-reported confidence score. Visualization was scored by either the attending or resident utilizing a scale of 1 to 4, with 1 representing poor to no visualization of the compartment and 4 representing optimal visualization with appropriate positioning and limited artifacts. Confidence in ability for each subject was also rated on a scale of 1 to 5, with 1 being little to no confidence in ability and 5 being absolute confidence in ability to visualize structures. Theory quiz, confidence, and visualization exam were completed by the students before and after the novel education curriculum.

Results: 20 medical students were assessed and significant improvements were displayed in all three categories. The theory quiz had averages of 5.2/10 and 8/10 ($p = 8.62E-07$, $\alpha = 0.05$). The visualization exam had averages of 1/4 and 3.38/4 ($p = 2.78E-11$, $\alpha = 0.05$). Given that a 1 out of 4 was the lowest possible score, a 3-fold improvement of proficiency with the ultrasound equipment was displayed. Confidence was also displayed to have increased as a result of this program, with pre-training confidence assessment being a 1.35/5 and a post-training confidence of 4.05/5 ($p = 5.2E-13$, $\alpha = 0.05$). All scores are reported as pre and post training scores respectively. Upon further analysis, an increase in confidence was also positively correlated with an increase in visualization ability. This correlation demonstrated an increase of 0.4 points of visualization ability gained for each point increase in confidence ($p=0.1048$, $\alpha = 0.05$). This indicates that student confidence is correctly reflective of newfound ability.

Conclusions: Given the significant improvements among the sample of first-year medical students, we anticipate successful implementation of this and similar curriculums for other medical professionals. An efficient standardized training program with simple implementation could offer ultrasound as a manageable bedside imaging option for all specialties.

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