

Assessing the effectiveness of a cadaveric workshop in improving resident physicians' confidence in performing ultrasound-guided joint injections

Évaluation de l'efficacité d'un atelier cadavérique pour améliorer la confiance des médecins résidents dans la réalisation d'injections articulaires guidées par échoguidé

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Implication Statement

Our study showed that an educational workshop using a cadaveric specimen is effective in improving resident physicians' confidence in performing ultrasound-guided, as well as landmark-based, joint injections. Participants also reported a strong interest in future cadaveric workshops on ultrasound-guided joint injections and believe such workshops would be a valuable educational resource for other physicians. Implementing cadaver-based ultrasound-guided joint injection workshops similar to the one discussed in this manuscript could be used to supplement training for these procedures in medical education and provide residents with the early experience they need to be able to perform these injections independently in clinic settings.

Énoncé des implications de la recherche

Notre étude a montré qu'un atelier éducatif utilisant un spécimen cadavérique est efficace pour améliorer la confiance des médecins résidents dans la réalisation d'injections articulaires guidées par échographie, ainsi que celles basées sur des repères. Les participants ont également fait part de leur vif intérêt pour de futurs ateliers cadavériques sur les injections articulaires guidées par échographie et estiment que de tels ateliers constitueraient une ressource éducative précieuse pour d'autres médecins. La mise en œuvre d'ateliers sur les injections articulaires échoguidées à partir de cadavres, semblables à celui dont il est question dans ce manuscrit, pourrait être utilisée pour compléter la formation à ces procédures dans le cadre de l'enseignement médical et fournir aux résidents l'exposition précoce dont ils ont besoin pour être en mesure de réaliser ces injections de manière indépendante dans des contextes cliniques.

Introduction

The use of ultrasound-guided joint injections has greatly increased with the advent of point of care ultrasound (POCUS). Traditionally, these injections have been performed using a landmark-based approach, which can have considerably lower accuracy, or in a hospital-based setting under fluoroscopy, which is expensive and resource-intensive.¹ With the advent of POCUS, any joint injections can now be performed under ultrasound-guidance in an outpatient clinic setting, which improves

both accuracy and healthcare cost.² There is limited time to learn technical procedures during medical training, and there is some concern patient safety is jeopardized when students perform their first procedures on patients,³ yet physicians are still expected to become proficient in numerous interventions. Simulations can provide a controlled environment for learning critical procedures that can result in reduced complications⁴ and cadaver-based simulations confer advantages such as more realistic anatomy and tissue consistency.⁵ Our aim was to assess the

effectiveness of an educational workshop using a cadaveric specimen in improving resident physicians' confidence in performing ultrasound-guided injections.

Description of the innovation

A two-hour educational workshop led by the study team consisted of a presentation, followed by a demonstration of joint assessment using ultrasound and four ultrasound-guided joint injections on two cadaveric specimens: acromioclavicular, glenohumeral, suprapatellar recess, and ankle. Thirteen family medicine residents participated. The primary outcome was resident physicians' confidence in performing ultrasound-guided joint injections pre- and post-workshop. Secondary outcomes included resident physicians' beliefs regarding the effectiveness of a cadaveric workshop to learn ultrasound-guided joint injections, interest in educational cadaveric workshops to learn these injections, and confidence in performing landmark-based injections in their future practice pre- and post-workshop. We administered a 17-item survey with 5-point Likert-type scale pre- and post-workshop and analyzed using descriptive statistics. We compared pre- and post-workshop scores for paired questions using the Wilcoxon signed rank test. We obtained ethics approval from the Western University Health Science Research Ethics Board (ID:118747) and received written informed consent from all participants.

Outcomes

Participant confidence significantly increased for all ultrasound-guided and landmark-based joint injections (see Table 1). All participants indicated the cadaveric workshop was a realistic and effective method to learn. Participants also reported a strong interest in future cadaveric workshops on ultrasound-guided joint injections and believed such workshops would be a valuable educational resource for other physicians.

Suggestions for next steps

The present study showed that an educational workshop using a cadaveric specimen is effective in improving resident physicians' confidence in performing ultrasound-guided, as well as landmark-based, joint injections. Implementing cadaver-based ultrasound-guided joint injection workshops similar to the one discussed in this manuscript could be used to supplement training for these

procedures in medical education and provide residents with the early experience they need to be able to perform these injections independently in clinic settings. Our study assessed increase in participant confidence, but not competency performing injections. It also did not assess the durability of confidence and skill retention post-workshop or in a clinical setting. Future studies are needed to determine translation into improved clinical skills and patient outcomes.

Table 1. Statistically significant gains in participant confidence in all areas studied

Injection Type	Pre-workshop Mean	Post-workshop Mean	Wilcoxon Signed Rank Test
US-guided	1.85 ± 0.77	4.00 ± 0.55	z=-3.12 p=0.001
Landmark	2.15 ± 0.77	3.92 ± 0.27	z=-3.06 p=0.002

US-guided	Pre-workshop Mean	Post-workshop Mean	Wilcoxon Signed Rank Test
AC	1.46 ± 0.75	4.15 ± 0.53	z=-3.12 p=0.001
GH	1.54 ± 0.63	3.54 ± 0.75	z=-3.06 p=0.002
Knee	1.42 ± 0.49	4.31 ± 0.61	z=-3.12 p=0.001
Ankle	1.54 ± 0.50	4.15 ± 0.36	z=-3.12 p=0.001

US-guided: Ultrasound guided; AC: acromioclavicular; GH: glenohumeral.

Conflicts of Interest: The authors have no conflicts of interest to declare.

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