Importance of Teaching Ultrasound- and Fluoroscopy-Guided Techniques in Vascular Access to Surgery Residents

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Dear Editor

Vascular access is a foundational clinical skill in surgical practice, with wide applicability in trauma, vascular surgery, critical care, and interventional procedures. While traditional landmark-based techniques have long been taught, robust evidence supports the superiority of ultrasound-guided vascular access for increasing first-pass success, reducing complications, and improving overall patient safety. Similarly, fluoroscopy-guided access remains essential for complex vascular procedures and should be taught systematically early in surgical training.

Ultrasound-guided access training has been shown to significantly improve procedural success and reduce safety risks compared to traditional techniques. Simulation-based curricula provide residents with repeated practice and objective feedback in a low-risk environment, leading to measurable performance gains. Moreover, simulation curricula specifically designed for femoral arterial access have demonstrated marked improvement in residents' technical ability and confidence. In addition, novel educational interventions, such as web-based and mastery learning systems, show promise in facilitating skill acquisition even outside traditional clinical settings.

Comparative studies have also highlighted procedural advantages of ultrasound guidance over fluoroscopy for common femoral artery access, including higher cannulation success and reduced inadvertent punctures critical insights that ought to guide surgical education priorities. As surgical practice increasingly integrates imaging modalities into both elective and emergency workflows, formal training in ultrasound and fluoroscopic techniques must be incorporated into residency curricula to ensure graduating surgeons are competent, safe, and prepared for modern clinical demands.

We therefore advocate for structured training modules in ultrasound- and fluoroscopy-guided vascular access, including dedicated simulation sessions, supervised clinical application, and objective competency assessments. Incorporating these skills into surgical residency education aligns training with contemporary practice, enhances patient safety, and equips future surgeons for the evolving scope of vascular and interventional care.

Thank you for considering this perspective.

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