

Clinical Application of Nerve Ultrasound by an Orthopedic Surgeon

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Abstract

Ultrasound has emerged as a valuable diagnostic tool for peripheral nerve disorders, offering higher soft-tissue resolution, real-time and dynamic imaging, and cost-effectiveness compared with conventional MRI. While radiologists traditionally perform most nerve ultrasound examinations, orthopedic surgeons can apply this modality directly in clinical practice to bridge diagnosis and surgical decision-making.

Based on my clinical experience as a hand surgeon, I present a series of representative cases where ultrasound played a critical role. These include postoperative neuroma detection, compressive neuropathies of the posterior interosseous nerve, median nerve pathologies such as thrombosed persistent median artery and torsion, and ulnar nerve entrapments at the elbow and wrist. In each case, ultrasound enabled accurate localization, assessment of dynamic changes, and guidance for appropriate surgical management.

Ultrasound demonstrates great versatility in the evaluation of peripheral nerve lesions. However, its effectiveness is highly operator-dependent, requiring solid knowledge of peripheral nerve anatomy and pathology. The greatest teacher is always the clinical case itself, and surgeons—who examine patients directly and perform operations—can gain the deepest understanding from these cases. Therefore, there is a distinct advantage when surgeons themselves perform and interpret nerve ultrasound, as it directly connects **clinical** findings, imaging, and surgical strategy.