

The Benefits of Orthopaedic Ultrasound

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Over the last few years, the use of musculoskeletal ultrasound has gained increased popularity. Ultrasound has been used for decades in many aspects of healthcare for its noninvasive nature and avoidance of exposure to ionized radiation. Though the bony architecture is not visualized in detail, ultrasound provides incredible insight into the soft tissue structures of the musculoskeletal system. Historically, musculoskeletal ultrasound has been primarily utilized by radiologists due to equipment costs. As the technology evolved portable ultrasound has become a cost-effective tool in Orthopaedic practice. Noninvasive musculoskeletal ultrasound allows a quick and immediate visualization of soft tissues.

Shoulder

In-office ultrasound allows visualization of partial and full-thickness rotator cuff tears, examination for calcific deposits within the shoulder and also allows for greater accuracy in injecting the specific areas around the shoulder. Anatomic landmarks were relied on for years to inject the acromioclavicular joint, subacromial space and glenohumeral joints. However, the advent of musculoskeletal ultrasound helps increase the reliability and accuracy of these injections. Anatomic visualization of the rotator cuff may now also be done in the office setting. It does not preclude the use of magnetic resonance imaging (MRI) for labral or other rotator cuff pathology, but ultrasound is a painless inexpensive test, now at our disposal.

Elbow

Similar to the shoulder, the use of ultrasound aids in the diagnosis of both medial and lateral epicondylitis and cubital tunnel syndrome. The accuracy of intra-articular aspirations and injections has improved utilizing ultrasound technology.



Hand and Wrist

One of the greatest advantages of in-office ultrasound is the evaluation of hand and wrist soft tissue abnormalities. The subcutaneous position of these abnormalities allows relatively easy access for diagnostic assessment. Aneurysms and ganglia may be differentiated by color Doppler ultrasound. For example, a mass that is fluid filled may be a ganglia, whereas a solid mass may be a tumor. Most foreign bodies are non-radiopaque, but diagnostic ultrasound allows the visualization of small foreign bodies buried in the subcutaneous tissue.

The differential diagnosis of radial wrist pain includes basal joint arthritis or deQuervains tenosynovitis of the first dorsal compartment. Identifying the diagnosis clinically may be



challenging. However, ultrasound of the first dorsal compartment may show tenosynovial inflammation and thickening of the first dorsal compartment which guides the differential diagnosis. Thickening or enlargement of the first dorsal compartment may also be easily visualized on ultrasound. In an inflamed wrist, the addition of ultrasound may guide a corticosteroid injection into an inflamed sheath and improve its efficacy.

Superficial traumatic hand lacerations may affect the integrity of underlying tendons. Ultrasound may visualize the intact or lacerated flexor tendons thereby eliminating a need for surgical wound exploration. Foreign bodies may also be readily visualized in the office setting and thereby avoid expensive and time-consuming testing.

Another advantage of diagnostic ultrasound is in the diagnosis of carpal tunnel syndrome. Ultrasound allows for visualization of the median nerve in the wrist. Multiple studies have demonstrated that a median nerve cross sectional area greater than 10mm is consistent with carpal compression. In hopes of avoiding useful though invasive, neuro-diagnostic testing, a faster painless noninvasive ultrasound may give significant information regarding the diagnosis of an entrapment neuropathy at the wrist. Furthermore, aspiration and injection of the smaller joints of the hand and wrist are far more accurate with ultrasound guidance. This minimizes patient discomfort.



The rheumatology literature has also reported the beneficial use of ultrasound to identify early inflammatory arthritis. A patient may present with one inflamed finger joint but be found to have inflammatory synovitis of multiple digits by ultrasound, thereby warranting further serologic investigation.

In summary, the utility of musculoskeletal ultrasound is an incredible advantage to the physician and it is an even more important benefit to the patient as it allows for a definitive diagnosis and more effective, less painful treatment.

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