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Title

Comparison of Contact and Non-contact Ultrasound Examination of the Hand

Purpose

The use of diagnostic ultrasound imaging (US) in the outpatient setting of Hand Surgery practices is low, as evidenced by the paucity of literature surrounding this low cost yet effective modality. The small field of view and poor contact of transducers with curved contours of the hands and feet are some of the reasons that restrict US evaluation. A water bath technique overcomes these limitations.

Methods

In a prospective study, we imaged healthy volunteers using two techniques; the traditional contact probe with gel and in a water bath at four sites: the 1st dorsal interosseous muscle, thenar eminence, flexor tendon and the median nerve. A group of doctors (n=25) from our department were asked to identify named structures by outlining them on the US images.

Results

The reliability of the two methods were compared using the inter-rater Intraclass correlation coefficient (ICC), which demonstrated that the water bath method was more reliable (ICC 0.97, $p < 0.001$) whereas the traditional probe with gel method had only moderate reliability (ICC 0.71, $p < 0.01$).

Conclusion

Data shows that soft structures in the hand are more identifiable by clinicians in a water bath and this methodology should be used more often in clinical practice.