



Scientific Abstracts

Poster View

Poster View VIII

POS1277 AUTOMATED ULTRASOUND SYSTEM ASSESSMENT - AN IMPORTANT ADJUNCT TO THE CLINICAL EVALUATION OF HANDS OF PATIENTS WITH ARTHRALGIA

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Abstract

Background:

Hand arthralgia are a common complaint in individuals of different ages seeking general practitioners. In the absence of swelling and trauma they may be a diagnostic challenge. Ultrasound with its non-invasive ability to visualize subcutaneous findings is a method widening our diagnostics of many pain conditions. Especially detecting changes in musculoskeletal structures has been in focus for the past thirty years enabling characterization of a vast amount of rheumatological conditions. One of them being subclinical synovitis, a finding which, in observational studies in patients at risk for rheumatoid arthritis (RA), has shown to precede and predict the onset of the disease. The emergence of automated ultrasound systems enables more efficient and flexible diagnostics of musculoskeletal disorders. The Arthritis Ultrasound Robot (ARTHUR) is an automated ultrasound

system for scanning of the joints of both hands and wrists, with subsequent scoring of synovial hypertrophy and Doppler signal using artificial intelligence.

Objectives:

The aim of the study was to evaluate if an examination with an automated ultrasound system in addition to a clinical examination may be sufficient when diagnosing patients with hand arthralgia.

Methods:

Patients with hand arthralgia, without clinical joint swelling, trauma or recognized neurological disorders, were referred from general practitioners in the Region of Zealand to an assessment with an automated ultrasound system and a subsequent clinical examination by an experienced rheumatologist at the Department of Rheumatology, Zealand's University Hospital at Køge, Denmark. The recruitment period started in July 2023 and ended in September 2024. Initially the referred patients underwent automated ultrasound scanning with ARTHUR using a GE Logiq E10 ultrasound unit. The joints scanned included wrists, metacarpophalangeal and proximal interphalangeal joints of all fingers of both hands. The joints were scanned dorsally in one position, both with greyscale and power Doppler ultrasound. The obtained joint images were afterwards automatically evaluated by ARTHUR, using artificial intelligence, according to the EULAR-OMERACT scoring system and a report was created summing up the synovial hypertrophy and Doppler gradings in a report for the rheumatologist. After the automated ultrasound scanning full history assessment and clinical examination were performed, including clinical evaluation of all peripheral joints. If the rheumatologist was able to come to a clinical decision on the basis of ARTHUR's and the clinical assessment the patient was not referred for diagnostic purposes to the ultrasound examination of the hands performed manually by an expert rheumatologist. Otherwise, the basis for the final clinical decision was supported by the manual ultrasound. The man-serviced ultrasound assessment comprised of an evaluation of the wrists, MCP and PIP-joints from all for the respective joints' available positions, performed both with greyscale and power Doppler ultrasound using similarly a GE Logiq E10 ultrasound unit. If both ultrasound examinations were performed, they took place 24 hours from each other at the latest.

Results:

In all, 90 patients with hand arthralgia were referred from the general practitioners to the automated ultrasound and clinical assessment. They were predominantly women (71%) and the age of patients lay between 26 and 91 years. Of the 90 patients who all underwent assessment by ARTHUR, 32 were further referred to the manual ultrasound assessment. Thus, the rheumatologist was able to come to

the clinical decision in 64% of the referred patients with hand arthralgia without the manual ultrasound.

Conclusion:

In almost two thirds of patients referred by general practitioners with hand arthralgia without joint swelling, trauma or recognized neurological disorders, clinical rheumatological assessment and ultrasound examination of the hands with an automated system was sufficient for coming to a clinical decision. Application of the automated ultrasound systems may facilitate and accelerate assessment of patients with joint involvement, where available for the ultrasound examination, while strengthening the clinical decision-making process.

REFERENCES:

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Disclosure of Interests:

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