Measuring finger joint cartilage by ultrasound is a promising alternative to conventional X-ray imaging

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Zielsetzung
This study evaluated for the first time the reliability and validity of use of ultrasound (US) imaging to measure metacarpophalangeal (MCP) and proximal interphalangeal (PIP) finger joint cartilage.

Methodik
We examined 48 patients with rheumatoid arthritis (RA), 18 patients with osteoarthritis (OA), 24 patients with unclassified arthritis of the finger joints, and 34 healthy volunteers. The proximal cartilage layer of MCP and PIP for digits 2-5 was bilaterally visualised from a posterior view, with joints approximately 90° in flexion. Cartilage thickness was measured with integrated tools on static images. External validity was assessed by measuring radiologic joint space width (JSW) and by using a numeric joint space narrowing score (JSN) in patients with RA.

Ergebnisse
Precise measurement was possible in 97.5% of the MCP and 94.2% of the PIP joints. Intraclass correlation coefficients for bilateral total joint US scores were 0.844 (95% confidence interval [CI] 0.648-0.935) for interobserver comparisons and 0.928 (95% CI 0.826-0.971) for intraobserver comparisons (when the same observer used different US devices). The US score correlated with JSN of the complete hands (adjusted \(R^2=0.513, p<0.001\)) and JSW of the same finger joints (adjusted \(R^2=0.635, p<0.001\)). Reduced cartilage shown by US allowed identification of early symptomatic OA versus early RA and healthy, and correlated with duration of treatment resistant progressive RA.

Schlussfolgerung
Direct visualisation and quantification of cartilage in MCP and PIP joints by US are objective, reliable, valid, and can be useful for diagnostic purposes in arthritis.