
High-res ultrasound for assessing TMJ disc position



According to a new study, high-resolution ultrasonography (US) showed a high level of accuracy (90.32%) in the diagnosis of temporomandibular joint (TMJ) disc displacement and could be a valuable imaging technique in assessing TMJ disc position.

"The diagnostic value of high-resolution ultrasonography depends strictly on the examiner's skills and on the equipment used and must be always correlated with the clinical findings," explain authors of the study published in the journal *Medical Ultrasonography*.

The TMJ is a synovial joint located anterior to the external auditory meatus, consisting of two bones (mandibular condyle and the glenoid fossa of the temporal bone), an articular disc, internal and external ligaments. Magnetic resonance imaging (MRI) is considered to be the reference standard in visualising the disc-condyle relationship and the soft tissue structures of TMJ. The accuracy of the MRI in revealing the disc position is 95% compared to autopsy studies. Its disadvantages are the high cost, low availability, and restricted use in patients with claustrophobia, pacemakers, and in patients with ferromagnetic metal implants.

The aim of this study was to determine the sensitivity, specificity, diagnostic accuracy, and positive and negative predictive values of US in the detection of TMJ disc displacements, compared to MRI. A total of 74 patients (148 TMJs) with signs and symptoms of TMJ disorders, according to the Research Diagnostic Criteria for Temporomandibular Disorders, were included in this study. All patients received US and MRI of both TMJs 1 to 5 days after the clinical examination. MRI examinations were performed using 1.5 T MRI equipment (Siemens Avanto, Siemens, Erlangen). Ultrasonographic examination was performed on a Hitachi EUB 8500 (Hitachi Medical Corp., Tokyo, Japan) scanner with L 54 M 6.5-13 MHz linear transducer.

The study's key findings included:

- MRI depicted 68 (45.95%) normal joints, 47 (31.76%) with disc displacement with reduction, 33 (22.3%) with disc displacement without reduction and 34 (22.97%) with degenerative changes.
- US detected 78 (52.7%) normal joints, 37 (25%) with disc displacement with reduction, 33 (22.3%) with disc displacement without reduction and 21 (14.19%) with degenerative changes.
- Compared to MRI, US showed a sensitivity of 93.1%, specificity of 87.88%, accuracy of 90.32%, a positive predictive value of 87.1% and a negative predictive value of 93.55% for overall diagnosis of disc displacement.

"A difficulty in our study, seen also in other papers, was to obtain high quality US images of TMJ, especially at mouth-opened position, due to the overlying bony structures. It was necessary to adjust continuously the transducer orientation in order to assess the correct disc position," the authors point out. "Our belief is that continuously training for interpretation of the US findings could lead to the diagnosis even of these minor disc displacements."

This study has some limitations including that each imaging examination was performed by a single radiologist – i.e., no intra- and interobserver agreement was done. Another limitation is that the accuracy of MRI (reference standard) is not 100%, therefore the statistical values obtained might be slightly different from the reality. Also, the results of both US and MRI are influenced by the examiner's experience.

Source: [Medical Ultrasonography](#)
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