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Dislocation of the Temporomandibular Joint Disk Demonstrated by CT

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The need to visualize soft-tissue components of the temporomandibular joint (TMJ) and the knowledge of the growing use of computed tomography (CT) in medical diagnostic imaging prompted one author (E. L. C.) to consider its potential for TMJ evaluation. The experience with our first patient who had an anteriorly dislocated joint disk has stimulated the use of CT for patients in the TMJ clinic. The CT equipment of several manufacturers now includes software functions that allow easy orthogonal and oblique plane reformatting and improved osseous and soft-tissue detail, features enhancing the value of CT over conventional radiography. While these newer scanning features have quickly shown their importance for improved imaging of the spine, temporal bone, orbit, face, and skull base, other regions await their evaluation. To our knowledge, the radiologic literature does not include reports of CT of the TMJ, but two reports have appeared in oral surgical journals [1, 2].

Case Report

A 21-year-old man came to the emergency room with restricted motion in his jaw and pain in his right TMJ. For the previous 2 years, he had noticed clicking in the right TMJ while chewing. At times, the jaw would catch while eating, but could be freed with manipulation. Examination showed a normal occlusion and no extractions. There was limited opening of the mandible with mild deviation to the right. Lateral movement to the left was also limited, and all functional motion produced pain on the right.

Hypocycloidal tomograms showed restriction of translational movement, much greater on the right, but normal-appearing joints in the closed position. CT was performed with the GE 8800 CT/T scanner using 1.5-mm-thick tomograms at 1.0 mm overlapping intervals. The TMJs were scanned only in the axial plane using a 2.5 cm bite block. Images were reconstructed in the standard mode and in the extended-range mode for optimum bone detail using the ReView (General Electric) program. Coronal and sagittal images were made with the GEDIS (General Electric) reformation program (fig. 1).

The images showed normal bony integrity around the smooth joint surfaces, but on the right a radiodense soft-tissue mass was present anterior to the mandibular condyle. There was definite widening of the right joint with a vacuum phenomenon posteriorly. The mass was discretely outlined anterior to the condyle and inferior to the temporal articular eminence. It was separate from the belly of the lateral pterygoid muscle, which appeared fatter than on the left. The findings strongly suggested anterior dislocation of the articular disk, which was later confirmed with positive-contrast, dual-compartment arthrography.

Silver splints were installed that gave pain relief but did not result in recapture of the joint disk. He underwent surgical exploration, which confirmed dislocation of the disk, and was treated with retrodiskal plication accompanied by a high condylar shave. Postoperatively, he regained function and remained free of pain.

Discussion

Certain features of periarticular soft tissues may be discerned with CT, although the osseous components are better defined, particularly when using the ReView program (fig. 1D). The displaced articular disk is probably visible because of an internal attenuation change, as it is not visible on the normal side. It should be quite possible to see periarticular soft-tissue inflammatory changes in inflamed joints, although we have not had an opportunity as yet to confirm this. Joint displacements are easier to observe with CT than with radiographs because of the multiplanar display and simultaneous ability to view both joints. Joint relations and measurements can be shown precisely.

A disadvantage of CT is that joint movements are harder to evaluate. The patient must remain motionless to produce optimal reformatted images. The necessity of scanning in the axial or coronal planes rather than in the sagittal plane, a limitation of CT, may not be a significant disadvantage because of the availability of sagittal reformatting. CT costs more than radiography but not much more than plain films and tomograms combined. The radiation exposure, about 5–8 rad (0.05–0.08 Gy) to the skin with adjacent or overlapping sections in one plane, may be similar to or less than tomography depending on the number of views and projections obtained.

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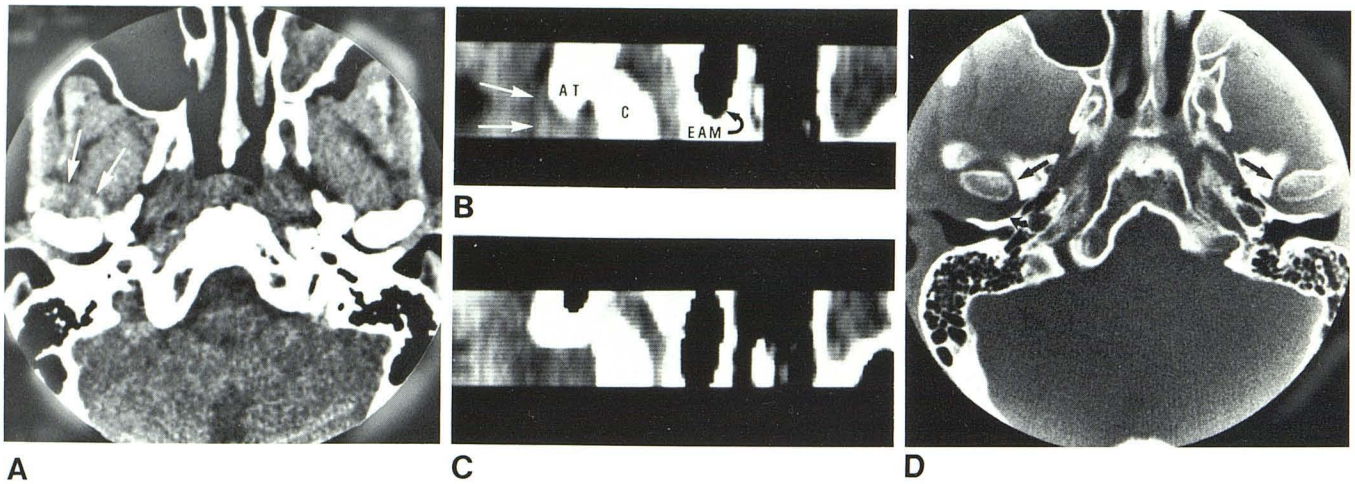

Fig. 1.—**A**, Axial section, soft-tissue windowing. Radiodense soft-tissue mass (*arrows*) anterior to right mandibular condyle. **B**, Sagittal reformation, right TMJ. Condyle (C). External acoustic meatus (EAM). Articular tubercle (AT). Anterior radiodense soft-tissue mass (*arrows*). **C**, Sagittal reformation, normal left side for comparison. **D**, Extended range (ReView), axial-plane images of TMJs (*arrows*) showing excellent bony detail and asymmetric condylar joint relations with wider spaces on right.

The axial-plane images offer a new perspective on the shape, texture, size, and density of the mandibular condyles and temporal processes. For evaluation of the articular disk, it may be that CT can substitute for positive-contrast arthrography only when the disk is displaced, as in our case. Positive contrast arthrography probably will be required when the disk is torn without displacement.

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