Temporomandibular Joint Structures: A Comparison Between Anatomic and Magnetic Resonance Findings in a Sagittal and an Angulated Plane

Michel H. Steenks, DDS, PhD
Department of Oral Pathophysiology

Ronald L.A.W. Bleys, MD
Department of Functional Anatomy

Theo D. Witkamp, MD
Department of Radiology

Utrecht University
University Hospital Utrecht
The Netherlands

Correspondence to:
Michel H. Steenks
Universiteitsweg 100
3584 CG
PO Box 80.037
3508 TA Utrecht
The Netherlands

Two temporomandibular joints originating from one specimen were investigated using magnetic resonance imaging and cryosectioning. Magnetic resonance images, photographs of the surface of the tissue block, and on-tape sections were compared. The left joint was imaged and sectioned in a sagittal plane, the right joint in a plane perpendicular to the long axis of the condyle. The densely plaited fibrous tissue of the disc proper correlated extremely well with the low signal intensity in magnetic resonance imaging. The transition between the densely plaited fibrous tissue and the looser tissue of the posterior attachment was located anterior to the thickest part of the intra-articular tissues in most sections of the specimen. The temporomandibular joint disc could be seen in angulated as well as in sagittal magnetic resonance scans. The posterior band was imaged best in angulated magnetic resonance scans throughout the temporomandibular joint.
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Magnetic resonance imaging (MRI) is currently used in diagnosing disc displacement of the temporomandibular joint (TMJ) and enables imaging of the soft tissues of the TMJ (eg, the disc proper and its attachments). The position of the posterior band of the TMJ disc with respect to the condyle in open and closed mouth position is used as an indicator of normal and altered disc position. With the mouth closed, the posterior band is in the superior position[1–6]; in the open mouth position, the posterior band is posterior to the mandibular head.

In the literature there is controversy regarding the extent to which the disc proper and its attachments can be imaged. Roberts et al[7] stated that the boundary between the intermediate zone and the posterior band can be mistaken for the boundary between the posterior band and the posterior attachment. This would lead to the conclusion that the disc is in a more anterior position than it actually is. A valid interpretation of the disc position requires a clear identification of the structures involved.

Researchers describe different scanning planes: sagittal and angulated[8,9]; the latter being perpendicular to the long axis of the mandibular head.

The aim of the present study is to compare anatomic and MRI aspects of the human TMJ structures in sagittal and angulated scanning planes, with emphasis on the disc and its attachments.

Materials and Methods

One undissected specimen (female, 91 years old, full denture wearer) was used for MRI and cryosectioning of the left TMJ in a sagittal plane and the right TMJ in an angulated plane. The dentures were removed without changing the mandibular position. Embalming via perfusion was performed in the closed-mouth position by a mixture of 1.5% formaldehyde, 0.5% glutaraldehyde, and 4.8% ethanol. Postfixation in 4% formaldehyde took place after decapitation.

Magnetic resonance imaging of the left TMJ was performed with a Philips (Best, The Netherlands) T5 (0.5 T) apparatus, and a Philips gyroscan S15 (1.5 T) was used to perform MRI of the right TMJ. The specimen was oriented in the MR scanner in a position comparable to the normal supine position used for patients. Both joints were imaged in the closed-mouth position. A circular surface coil (8-cm diameter, receiver only) was positioned over the TMJ. A short, spin echo (SE), T1-weighted, transverse scout scan was used to identify the location of the TMJ. On the left side, a sagittal series was acquired, with a parameter choice comparable to the standard T1-weighted images used in clinical patients: nine 3-mm slices, slice gap = 0.5 mm, SE = 400/20/4 (TR/TE/NEX), and field of view (FOV) 150 mm. On the right side, two angulated series were acquired: seven 3-mm slices, slice gap = 0.6 mm, SE = 600/30/2 (TR/TE/NEX), and FOV = 275; and seven 3-mm slices, slice gap = 0.6 mm, SE = 600/50/2 (TR/TE/NEX), and FOV = 110. Both were with an angulation of 30 degrees to the sagittal plane, perpendicular to the long axis of the condyle. A 256 × 256 scan matrix was used.

After MR scanning, the head was frozen at –40°C and cut into halves using a band saw. After this, a second postfixation in 4% formaldehyde took place, followed by rinsing in running tap water for several days. After impregnations in 0.5% and 1% carboxymethylcellulose (CMC) at 60 Torr, the halves were frozen again by liquid nitrogen. The frozen tissue blocks were trimmed to obtain the correct mounting planes in the cryomicrotome, taking the MR imaging planes into account, and subsequently embedded in 1% CMC. The undecalcified block was then placed in the cryomicrotome at –20°C.

The chosen thickness for sectioning was 25 µm. Pictures of the surface of the tissue block in the region of the TMJs and on-tape sections[10] were taken after every 0.5 mm of sectioning. The latter were stained with a modified Mallory-Cason procedure[10] and mounted on cardboard.

A corresponding photograph and section were assigned to each of the MR images, taking into account the slice thickness, slice gap, and section interval. The choice of photographs and sections was checked by comparing with MR images.

Evaluation of the anatomic details in the region of the TMJ was carried out by determining the recognizability of relevant structures with regard to the articular disc proper, disc attachments, joint spaces, and the lateral pterygoid muscle. This was done on MR images, photographs, and sections.

The disc proper was defined as the part of the intra-articular tissues situated between the anterior and posterior attachments that consisted of densely plaited fibrous tissue.[11] On MR images this part was characterized by low signal intensity, on surface photographs by a whitish appearance, and on sections by a compact mass of tissue. For recognition of the anterior band, intermediate zone, and posterior band, differences in thickness should occur in the disc proper.

In the posterior attachment, the bilaminar region and the mandibular attachment were discerned. On surface photographs and sections, the bilaminar region was defined as the less dense fibrous tissue behind the disc proper that did not represent the attachments in the vicinity of the osseous structures. On MR images, it was represented by the region behind the disc proper, which showed higher signal intensity.

The lateral pterygoid muscle attachments to the articular disc and pterygoid fovea were discerned. For recognition of the superior and inferior heads, both heads should be visible.

Since the difference in scanning systems (1.5 T versus 0.5 T) used in the left and right joints does not allow conclusions on visualization of the TMJ disc due to angulation, the right joint of our specimen was also scanned in a sagittal plane using the same scanning parameters: 3-mm slices, slice gap = 0.6 mm, SE = 660/50/2 (TR/TE/NEX), and FOV = 110 mm. Moreover, the left joint from another specimen was scanned in both a sagittal and an angulated plane using the same scan parameters: 3-mm slices, slice gap = 0.3 mm, SE = 720/50/4 (TR/TE/NEX), and FOV = 110 mm.

Results

Anatomic findings and MR images are shown in Figs 1a and 2f for the sagittal and angulated scan planes; the part of the joint involved is indicated by the shaded slices.

Figs 1a to 1f MR images *(a, d)*, corresponding surface photographs *(b, e)*, and sections *(c, f)* in the central part of the TMJ; sagittal plane *(a* to *c)* versus angulated plane *(d* to *f)*. The insets in the MR images show the parts of the joint involved and the scanning planes, projected on a superior view of the mandible. Shrinkage, occurring in intra-articular tissues on sections, is due to the Mallory-Cason staining procedure. The disc proper is characterized by a whitish appearance on the surface photographs *(b, e)* and by a compact mass of tissue on the sections *(c, f)*, representing the densely plaited fibrous tissue. This part of the disc correlates well with the low signal intensity on MR images *(a, d)*. The large arrows indicate the transitions from the disc proper *(a)* or the posterior band *(b* to *f)* to the bilaminar region. The posterior band is not depicted in *(a)*, probably due to a partial volume effect. (The arrowhead points to the anterior band, the small arrow to the intermediate zone. C = condyle, T = articular tubercle, LPM = lateral pterygoid muscle.)

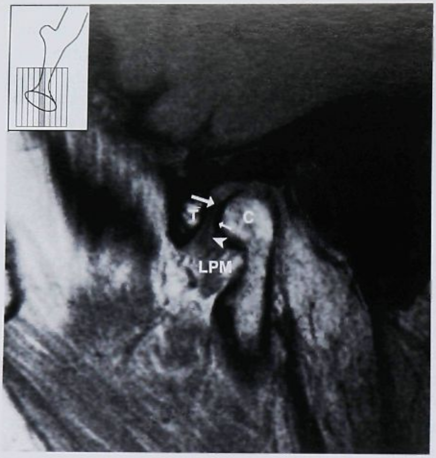


Fig 1a MR image of central part of TMJ in sagittal plane.

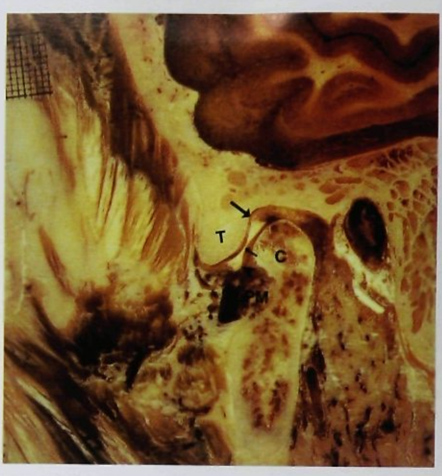


Fig 1b Corresponding surface photograph.

Fig 1c Corresponding section.

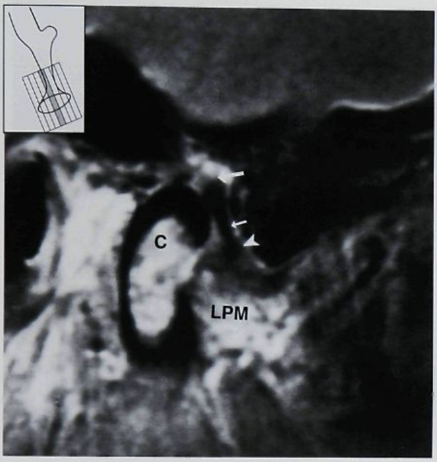


Fig 1d MR image of central part of TMJ in angulated plane.

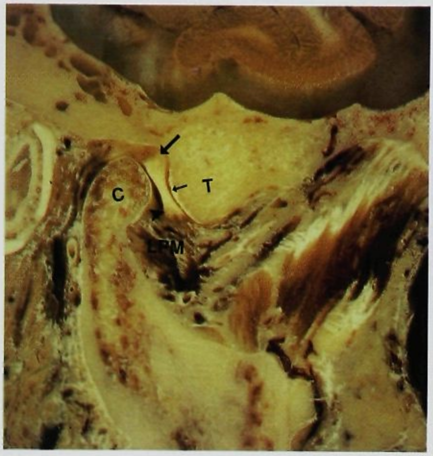


Fig 1e Corresponding surface photograph.

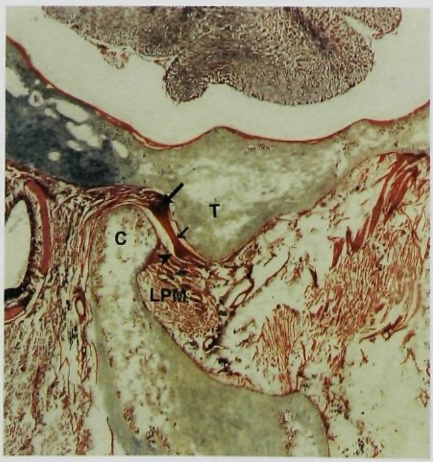


Fig 1f Corresponding section.

Figs 2a to 2f MR images *(a, d)*, corresponding surface photographs *(b, e)*, and sections *(c, f)* in the medial part of the TMJ; sagittal plane *(a* to *c)* versus angulated plane *(d* to *f)*. The insets in the MR images show the parts of the joint involved and the scanning planes. The disc proper is represented by the low signal intensity *(a, d)*, whitish appearance *(b, e)*, and compact mass of tissue *(c, f)*. (The large arrows indicate the transitions from the posterior band to the bilaminar region, showing that the posterior band does not cover the thickest part of the intra-articular tissue completely. The arrowhead points to the anterior band, the small arrow to the intermediate zone. C = condyle, T = articular tubercle, LPMs = superior head of lateral pterygoid muscle, LPMi = inferior head of lateral pterygoid muscle.)

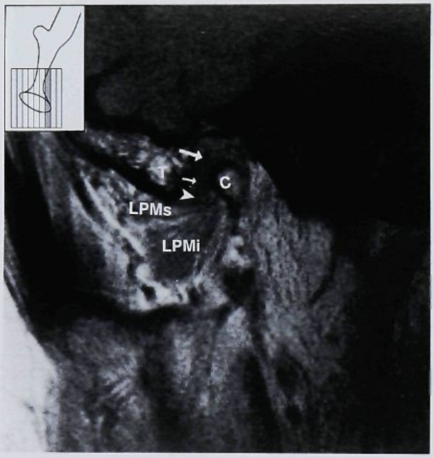


Fig 2a MR image of medial part of TMJ in sagittal plane.

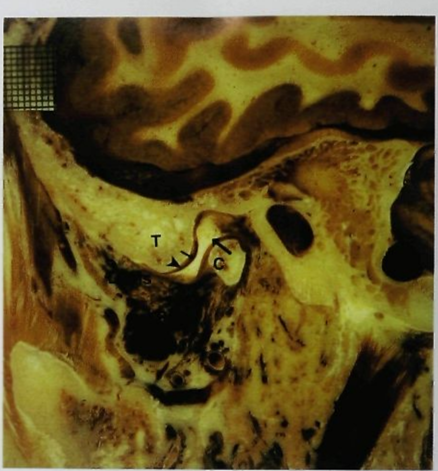


Fig 2b Corresponding surface photograph.

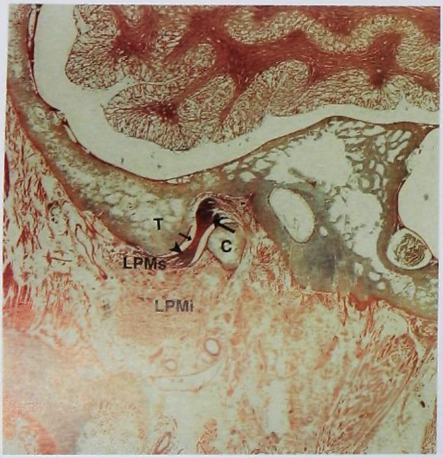


Fig 2c Corresponding section.

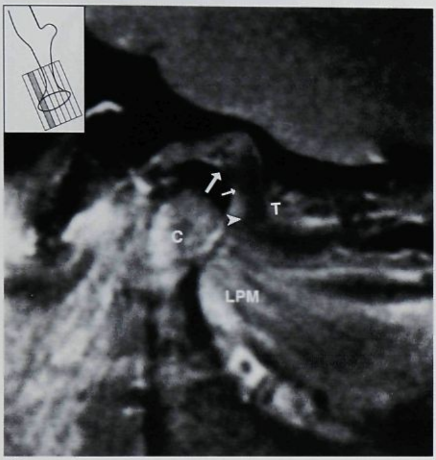


Fig 2d MR image of medial part of TMJ in angulated plane.

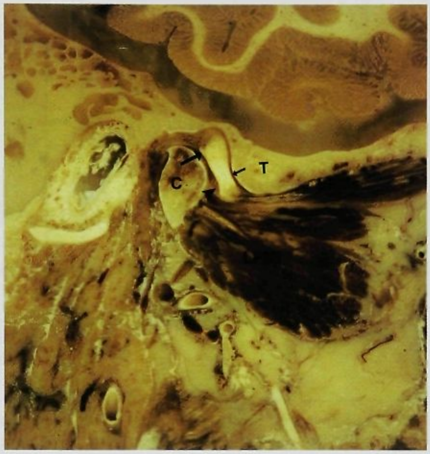


Fig 2e Corresponding surface photograph.

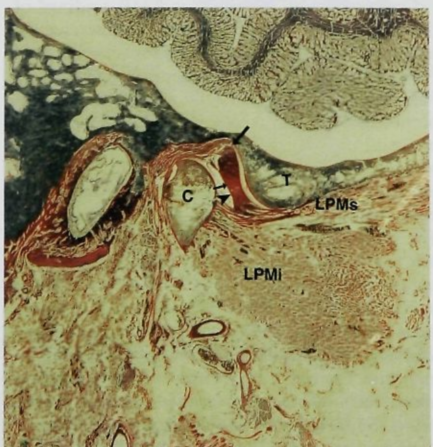
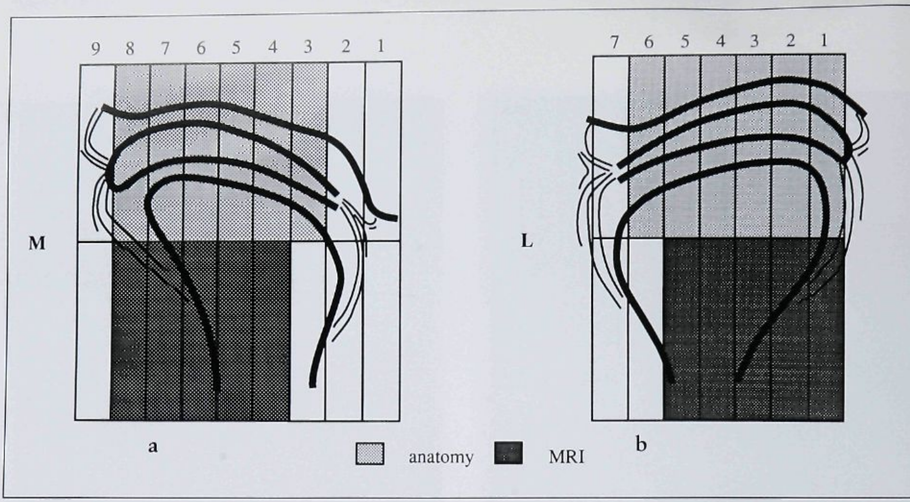


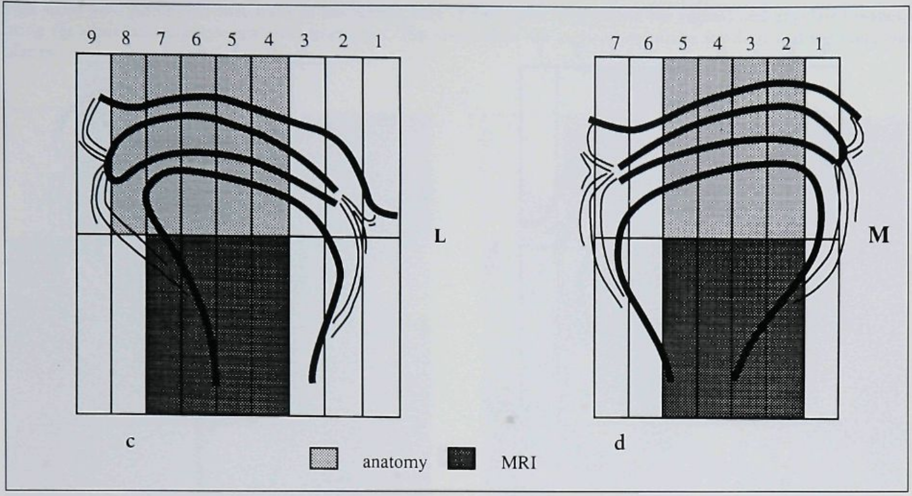
Fig 2f Corresponding section.

Figs 3a to 3j Results of the comparison of anatomic (ie, surface photographs and sections; light shading) and MR findings (dark shading) in the sagittal plane *(left)* and in the angulated plane *(right)*. Shading represents recognizability of the structure involved in the concerning slice. The slices are projected on an anterior view of the left joint (sagittal plane, *left*) and on an anteromedial view, parallel to the long axis of the condyle, of the right joint (angulated plane, *right*). M = medial, L = lateral.

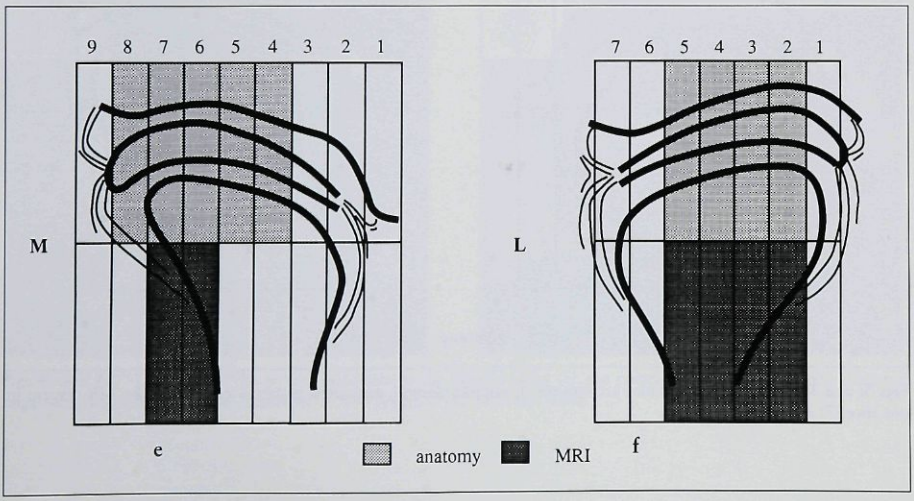


Figs 3a and 3b Disc proper *(a*, sagittal plane; *b*, angulated plane): there is a high correlation between the anatomic sections and MR except in the very lateral part of the joint, where the disc is not imaged by MR (cf Fig 7).

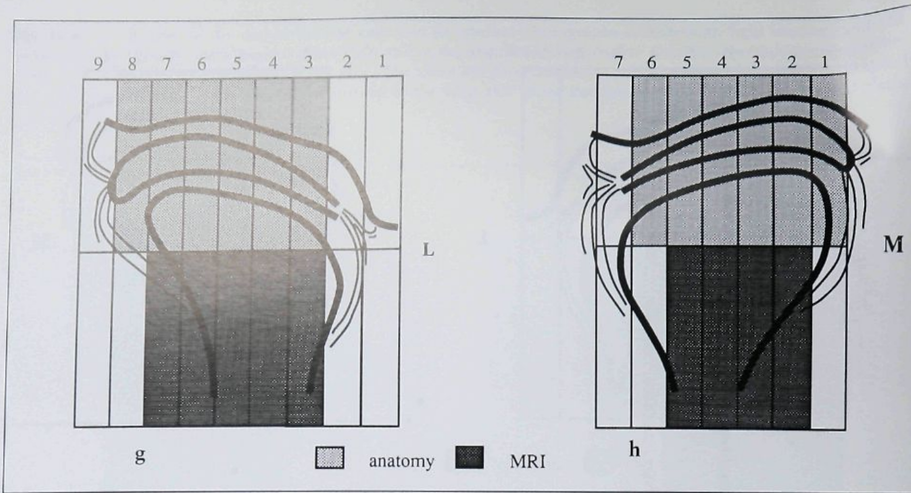
Comparison of anatomic and MR findings of the disc proper, the anterior band, the intermediate zone, the posterior band, the bilaminar region, and the posterior mandibular attachment are shown in Figs 3a through 3j for sagittal and angulated scan planes. The TMJ disc, indicated by low signal intensity in MRI, could be seen in angulated as well as in sagittal scans (Figs 3a and 3b). The anterior band and intermediate zone were imaged in both angulated and sagittal scans (Figs 3c and 3d). The posterior band was imaged best in angulated MR scans throughout the TMJ (Figs 3e and 3f); on sagittal MR images it could be seen only in the medial part of the joint. The same MR observations were made in the comparison of the two scanning planes in the right joint of the first specimen and the left joint of the second specimen, which were additionally scanned in those planes, using the same scanning systems and the same scanning parameters (Figs 4a to 4d). The bilaminar region could be seen in both sagittal and angulated MR scans throughout the joint, but not in detail (Figs 3g and 3h). The posterior mandibular attachment could not be depicted in MRI except in one medial slice in an angulated scan plane (Figs 3i and 3j). The thickest part of the structures in between the TMJ articular surfaces was partially depicted in MRI (Figs 2d and 2e); only the dense fibrous tissue could be seen. The looser tissue located at the thickest part of the intra-articular structures in surface photography and in the sections (Figs 2e and 2f) could not be recognized as a part of the posterior band in MRI. The transition from the densely plaited fibrous tissue to the looser posterior attachment was located anterior to the thickest part of the intra-articular tissues in this specimen (Figs 5a to 5c). An example of the high contrast between posterior band and posterior attachment in MRI and the corresponding anatomic findings is depicted in Figs 6a to 6c.



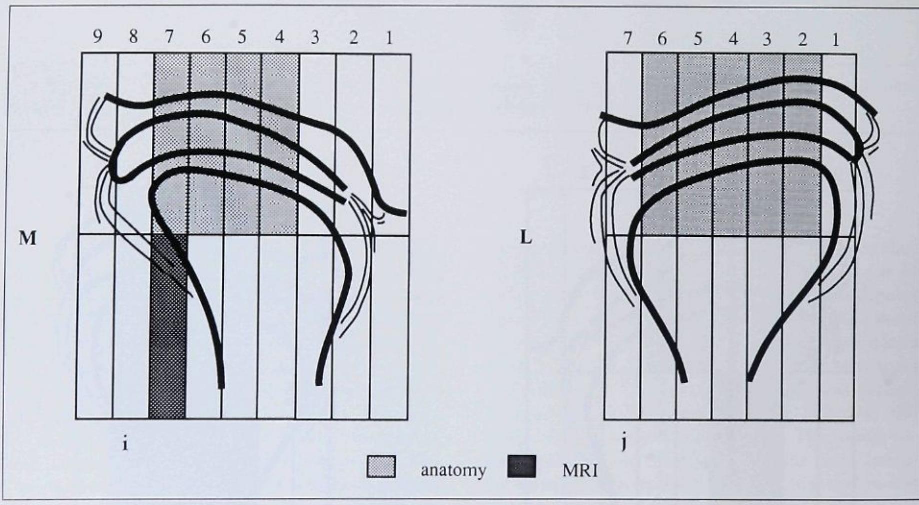
Figs 3c and 3d Anterior band and intermediate zone (*c*, sagittal plane; *d*, angulated plane): there is a high correlation except in the very medial part of the joint in the sagittal plane.



Figs 3e and 3f Posterior band (*e*, sagittal plane; *f*, angulated plane): on MR images the posterior band could be recognized throughout the joint in the angulated plane, but not in the sagittal plane, in which the posterior band was visible only in the medial part of the joint (slices 6, 7).

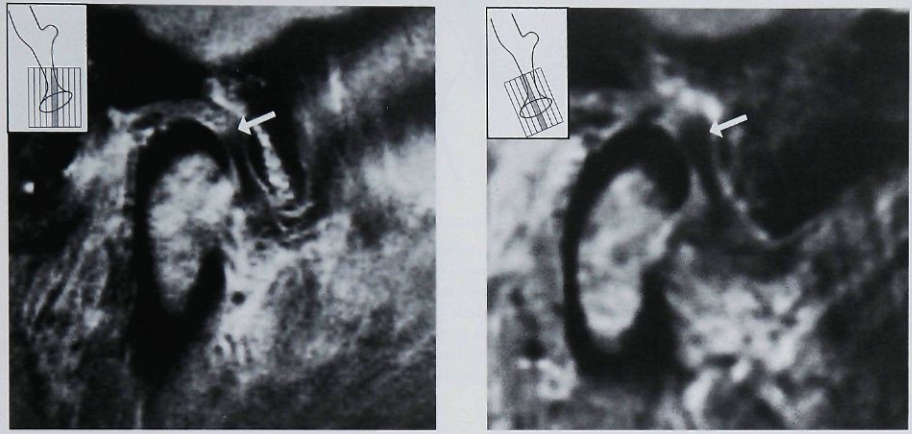


Figs 3g and 3h Bilaminar region *(g,* sagittal plane; *h,* angulated plane): a high correlation in most parts of the joints.

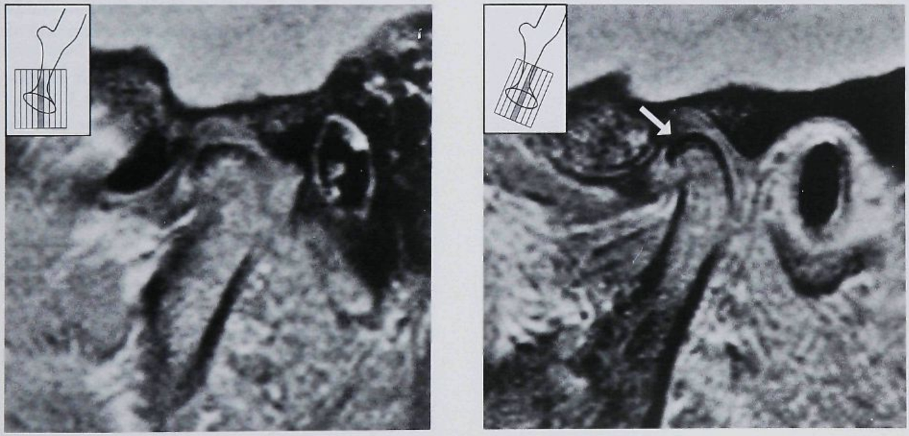


Figs 3i and 3j Posterior mandibular attachment *(i,* sagittal plane; *j,* angulated plane) is not imaged by MR, except in one slice (7) in the sagittal plane.

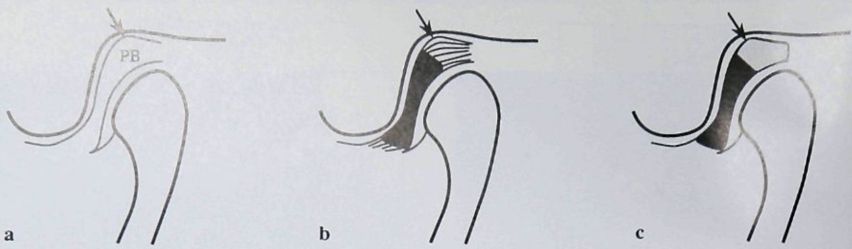
Figs 4a to 4d Additional MR scans in the central part of two joints to compare the sagittal and angulated planes, using the same scanning systems and parameters. The insets show the parts of the joints involved and the scanning planes.



Figs 4a and 4b Right joint of the first specimen: in the sagittal plane *(a)*, the posterior band (arrow) is less developed than in the same joint, angulated plane *(b)*, where the arrow points to the posterior band.



Figs 4c and 4d Left joint of the second specimen: in the sagittal plane *(c)*, the posterior band is not visible; compare same joint, angulated plane *(d)*, where the arrow points to the posterior band.



Figs 5a to 5c Impression of the TMJ disc as seen: *(a)* in arthrography, the arrow indicates the thickest part of the posterior band (PB), as often described in the literature. Only contours are depicted without providing any information about tissue characteristics; *(b)* on surface photography and sections, the arrow indicates the thickest part of the posterior band (cf Figs 8b and 8c), the disc proper is shaded black and its posterior border is anterior to the thickest part of the intra-articular tissue, loose fibrous tissue can be seen at the thickest part of the posterior band; and *(c)* on MRI scans, the arrow indicates the thickest part of the posterior band (cf Fig 8a), the disc proper is shaded black, indicating low signal intensity, loose tissue is shaded bright, indicating higher signal intensity than the disc proper; however, no detailed information can be obtained.

The anterior band and intermediate zone could be seen in MRI throughout the joint, both in sagittal and angulated scans, with the exception of the very lateral scans. Here, the disc proper is very thin (Figs 7a to 7c).

The images of the joint spaces correlated with their appearance in surface photography.

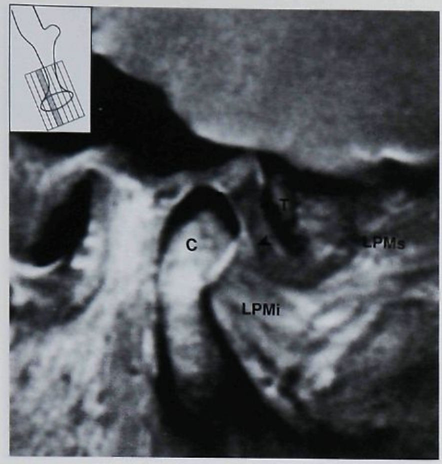
The lateral pterygoid muscle was depicted in the central and medial joint areas in MR. The upper and lower heads in the infratemporal fossa could be seen in the medial images. Angulated scans showed the course of the lateral pterygoid muscle over a longer trajectory. Its attachment to the disc could not be imaged in MRI; the attachment to the fovea was evident.

Details of changes in the soft tissue were imaged (Figs 8a to 8c). In this specimen, the section revealed the nature of a solid black spot in the anterior band of the left TMJ; according to the color on the section, this represents a calcified spot in the disc.

Discussion

Figures 1a, 2a, 7a, and 8a show the MRI scans of the left TMJ. Scan parameters are equal to the ones used in clinical patients on a 0.5-T system. The contrast between the disc proper and the surrounding tissue of these cadaver scans is low. In clinical patients there usually is a greater difference between the low signal intensity of the disc proper and the intermediate signal intensity of the surrounding tissue using the same scan parameters. This is due to the influence of the fixation fluids on the various tissues, which leads to a decrease of the T1 values.

In an attempt to improve the contrast resolution, the right TMJ was scanned on a 1.5-T system. When the same scan parameters were used as in clinical patients, there was a slight improvement of the contrast resolution in comparison to the 0.5-T system. However, in comparison to the average patient, the contrast between the disc and the surrounding tissues was still low. Apart from changing the field strength, the echo time (TE) was prolonged from 30 to 50 ms to improve the contrast resolution. This gave a further improvement of the contrast between disc and surrounding tissues. This longer TE enabled a reduction in the FOV to optimize the spatial resolution. This is a consequence of the relatively low maximal gradient capability (3 mT in the 1.5-T system). Combinations of a small FOV (below 200 mm) and a short TE (eg, 30 ms) are impossible. A choice has to be made either for a better spatial resolution (eg, 110 mm) or more T1 contrast with short TEs. In these scans (Figs 1d, 2d, and 6a), the disc shows the normal low signal intensity compared to the intermediate signal intensity of the surrounding tissues, as is usually found in clinical patients. In the second specimen, the normally

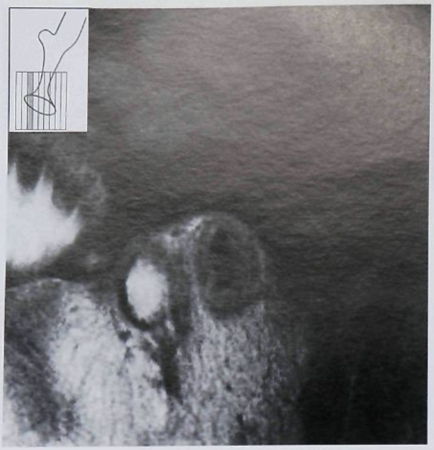


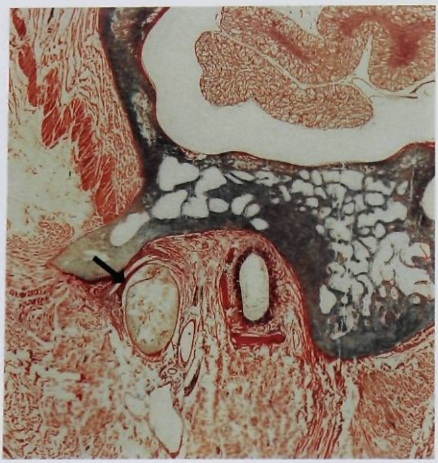
Figs 6a to 6c MR image showing high contrast between the posterior band and the bilaminar region *(above, left)*, the large arrow indicating their transition; corresponding surface photograph *(above, right)* and section *(right)*, showing a high correlation with regard to imaging of the disc proper. (The arrowhead points to the anterior band, the small arrow to the intermediate zone. C = condyle, T = articular tubercle, LPMs = superior head of lateral pterygoid muscle, LPMi = inferior head of lateral pterygoid muscle.)

used scan parameters were also changed to optimize the scan results.

The present investigation deals with morphologic aspects; other relevant MR aspects in TMJ imaging (eg, T2-weighted images, spectroscopy, contrast media) were not addressed. Identification of the posterior band and the bilaminar region is important to diagnose anterior displacements of the TMJ disc on MR images and is based on morphologic criteria. Results indicate a good visualization of the dense fibrous tissue of the disc proper. The bilaminar region presents itself as an area with higher signal intensity. Occasionally some structure can be observed; however, it is not clear which structures exactly are represented. In contrast to the disc proper, the mandibular posterior attachment and the temporal posterior attachment cannot be identified consistently.

The disc proper was defined as the part of the intra-articular tissues situated between the anterior and posterior attachments that consisted of densely plaited fibrous tissue. This is in contrast to a





Figs 7a to 7c MR image *(above, left)*, corresponding surface photograph *(above, right)*, and section *(left)* in the lateral part of the joint, sagittal plane. The disc proper is visible (arrow) on the surface photograph and section, but is very thin. The anterior band, intermediate zone, and posterior band cannot be distinguished. The disc proper is not imaged by MR in this part of the joint. The displacement of the condylar periost below the disc proper is an artifact.

report by Rees,[11] who included the bilaminar zone as a part of the disc. He described four clearly defined transverse ellipsoidal zones: the anterior band, intermediate band, posterior band, and bilaminar zone. These zones were defined by their relative thicknesses; demarcations were not indicated. The posterior band is "much the thickest of the three (anterior band, intermediate zone, and posterior band) and is also the widest from before backwards."[11] Studies with autopsy specimens and arthrography implemented this description.[4–6] Dense disc tissue is drawn posterior to the thickest part of the TMJ intra-articular tissues.[12,13] In the present specimen, the correlation between dense fibrous tissue (surface photography and slices) and the low signal intensity (MRI) is striking. The area with low signal intensity in MR images represented the disc proper; it does not necessarily include the thickest part of tissues in between the articular surfaces (Figs 5a to 5c). Reviewing the literature shows this morphology of the posterior band and the posterior attachment,[14,15] although it

Figs 8a to 8c MR image showing a black spot (arrow) in the anterior band *(above, left)*. Corresponding surface photograph showing the same spot (arrow), somewhat darker than the tissue of the disc proper *(above, right)*. Corresponding section showing the same spot (arrow) *(right)*. According to the color of the spot, it represents a calcification. Note: in the present sagittal series this MRI scan (scan 6, Fig 3c) was the first one to show the posterior band.

has not been acknowledged as such. The present results support findings in which (parts of) the thickest part of the TMJ intra-articular tissue are not imaged,[7] although another explanation was provided by this author: the difference between collagen fiber direction in the intermediate zone and the posterior band with respect to the magnetic field. However, because one specimen was used in the present study, generalization of this finding has to be done with great care.

The position of the posterior band in between the articular surfaces is important because this structure is responsible for many of the signs and symptoms of disc displacement (clicking and locking) on a mechanical basis, as proved by autopsy studies and arthrography.[12] It was also found that in a normal joint the intermediate zone is interposed between the articulating surfaces in both open and closed mouth positions. In case of an anterior disc displacement, the posterior band, intermediate zone, and anterior band can be seen in front of the mandibular head completely, or seen partially in the lateral or medial part of the joint in the closed mouth position. All kinds of variation can occur. In partly or fully open mouth positions, the posterior band or parts of this structure return to the original position (reduction) or stay in front of the mandibular head (nonreduction). In analyzing the closed mouth view, the dense fibrous tissue position of the posterior band is used as a criterion to be checked in all parts of the joint to be able to diagnose anterior disc displacement. It should be kept in mind that in MRI, tissue hydrogen content is depicted rather than thicker or thinner areas of the TMJ intra-articular tissue. In areas of the disc where tissue characteristics are heterogenous, identification of various structures is therefore complicated. This is especially the case in the transition from the posterior band to the posterior attachments. Here, loose fibrous tissue of the bilaminar region is next to the dense fibrous tissue of the disc proper. Sections of this area show that there is not always a distinct demarcation (cf Figs 1c, 1f, 2c, and 2f), which gives room for equivocal judgments. An area of higher signal intensity in the center of the posterior band is described.[3,16] In the present specimen, this was not observed; however, diffuse areas of higher signal intensity could be seen throughout the disc proper (Figs 2d and 6a).

The orientation of the slices through the TMJ is described in this study as sagittal[9] and angulated (corrected for the angle of the long axis of the mandibular head with the sagittal plane[8]). Sagittal scanning is sometimes described when corrected scanning was performed.[17] In the diagnostic process, the position of the posterior band as a part of the disc proper plays an important role. The results of a recent study using a larger series of clinical patients and cadaver specimens show that angulation is to be preferred over sagittal scanning.[18] The present results indicate that the difference between sagittal and angulated scanning is particularly important for visualization of the posterior band. Angulation allowed the depiction of MRI scans of the lateral and the central part of the posterior band seen anatomically, whereas in sagittal scans the posterior band could only be seen in the medial parts (Figs 3e and 3f). The development of the posterior band in the sagittal plane can be seen in anatomic sections 3 to 5 (Fig 3e): section 3 (Fig 7b) shows a very thin disc; in section 4 differences in thickness can be recognized (posterior band, intermediate zone, anterior band, Figs 3c and 3e); and in section 5 (Fig 1b) the posterior band is more developed. In MRI, the posterior band cannot be seen until image 6 (Figs 3e and 8a). The different scanning systems (1.5 T versus 0.5 T) are not likely to be responsible for this phenomenon. In sagittal MRI scans of the right joint of the first specimen using the same scanning system (1.5 T) and the same scan parameters, the same observations could be made (Figs 4a and 4b). The results of different scanning planes with the second specimen using the same scanning system (0.5 T) and the same scan parameters showed the same trend (Figs 4c and 4d). Partial volume effects (caused by a thicker and thinner part of disc tissue within one MRI scan) should be considered to explain the differences between anatomic findings and MRI scans in a sagittal plane.

In angulated MRI scans, sections, and surface photographs, the course of the lateral pterygoid muscle could be visualized better than in sagittal scans. This is due to the fiber direction, which is anteromedially oriented. It should be noted that the angle between this muscle and the sagittal plane is bigger than the angle of the angulated scan plane with the sagittal plane. The lateral pterygoid muscle pulls the condyle (and disc) inward, which may be an explanation for anteromedial disc displacement.

Conclusion

This study shows that MRI of the TMJ intra-articular structures accurately represents the disc proper. In the present specimen, as in others shown in the literature, the posterior band as defined by Rees does not always correspond to the thickest part of the intra-articular tissues. Angulation of the slices best depicts the posterior band.

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Resumen

Comparación entre los hallazgos anatómicos y de resonancia magnética en un plano angulado y sagital de las estructuras de la articulación temporomandibular

Se investigaron dos articulaciones temporomandibulares provenientes de un espécimen, por medio de imágenes de resonancia magnética y de técnicas de crioseccionamiento. Se compararon las imágenes de resonancia magnética, las fotografias de la superficie del bloque de tejido, y las secciones existentes. Se realizaron imágenes de la articulación de lado izquierdo, y seccionamientos en un plano sagital; en la articulación del lado derecho los cortes fueron en un plano perpendicular al eje longitudinal del cóndilo. El tejido fibroso densamente plegado correspondiente al disco, se correlacionó extremadamente bien con la baja intensidad de la señal de las imágenes de resonancia magnética. La transición entre el tejido fibroso densamente plegado y el tejido mas suelto de la inserción posterior estaba localizada en un sentido anterior a la parte mas gruesa de los tejidos intra-articulares en la mayoría de las secciones del espécimen. El disco de la articulación temporomandibular podía ser visto en las imágenes tanto anguladas como sagitales del escáner de resonancia magnética. La banda posterior fue visualizada mejor por medio de las imágenes anguladas del escáner de resonancia magnética a través de la articulación temporomandibular.

Zusammenfassung

Strukturen des Kiefergelenkes: Ein Vergleich zwischen anatomischen—und Magnetresonanz (MR)-Befunden in der sagittalen und einer abgewinkelten Ebene

Zwei Kiefergelenke vom selben Präparat wurden mit MRI und Gefrierschnitt-Technik untersucht. MR-Bilder, Photographien von der Oberfläche des Gewebeblocks und aufgezogene Schnitte wurden verglichen. Das linke Kiefergelenk wurde in sagittaler Richtung abgebildet und geschnitten, das rechte in einer zur Längsachse des Kondylus rechtwinkligen Ebene. Das dicht gewobene fibröse Gewebe des Diskus selbst stimmte sehr gut mit der schwachen Signalintesität im MR Bild überein. Der Übergang zwischen dem dicht gewobenen fibrösen Gewebe und dem lockereren Gewebe des Posterioren Diskattachments befand sich in den meisten Schnittebenen vor dem dicksten Teil des intraartikulären Gewebes. Der Diskus des Kiefergelenkes konnte sowohl in sagittalen als auch in abgewinkelten MR-Schnitten gesehen werden. Das posteriore Band hingegen wurde abgewinkelten MR-Bilder über das gesamte Kiefergelenk am besten wiedergegeben.