

Temporomandibular joint: an anatomical approach method

Abstract

Objective: To describe a technique for a conservative approach to anatomical study of the temporomandibular joint (TMJ); this method is designed to demonstrate the structure of the TMJ while teaching Anatomy to Dentistry and Medical students.

Methodology: We took the head of a specimen, emptied the cranial cavity and determined a point of reference, situated approximately 2cm behind the external acoustic meatus. Then we traced a line from this point up to the midpoint of the margin that separates the anterior cranial fossa from the middle cranial fossa, bilaterally. Based on these reference lines, we cut the head.

Results: Two halves of the TMJ was obtained permitting us to visualize the soft and osseous articular components. **Conclusion:** This technique provided good samples of both TMJs without damage to the neighboring anatomical structures.

Keywords: anatomy, temporomandibular joint, temporomandibular joint disc

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Abbreviations: TMJ, temporomandibular joint

Introduction

Only a few textbooks show some anatomic samples of the TMJ because its anatomical study presents several difficulties.¹ Separation of the joint in a block results in sacrificing many structures, which is unacceptable. The challenge, therefore, is to standardize a procedure that allows one to study the TMJ components, while preserving the anatomical structures around it to the maximum extent.

Materials and methods

We took the head of a specimen, emptied the cranial cavity and determined a point of reference, situated approximately 2cm behind the external acoustic meatus (Figure 1).

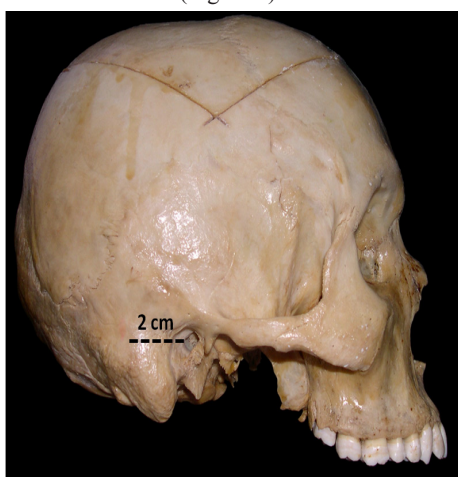


Figure 1 Point of reference posterior to the external acoustic meatus.

After this, for both sides, we traced a line from this point up to the midpoint of the margin that separates the anterior cranial fossa from the middle cranial fossa; this margin being formed by the smaller wing of the sphenoid bone and by the horizontal lamina of the frontal

bone (Figure 2). Based on these reference lines, we made the cuts of the part, which resulted in three segments: A central segment with a triangular shape and two lateral segments (Figure 3).



Figure 2 Guide line through the middle cranial fossa, indicating the trajectory of the cut.

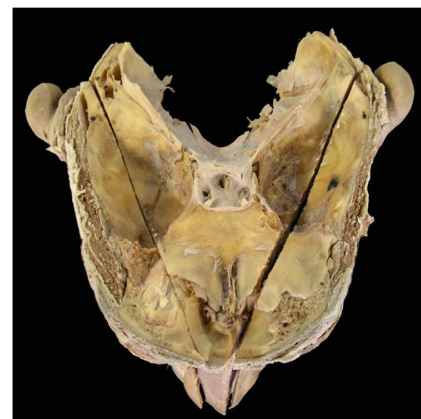


Figure 3 Anatomic parts sectioned according to the pre-established guidance.

Results

After separating the segments, we perceived that the cut passed approximately through the center of the mandibular condyle, which made it possible to visualize the two halves of one and the same TMJ (Figure 4).



Figure 4 Result of the procedure showing the TMJ on the right side and on the left.

Dissociation of the structures from the lateral segments allow detailed observation of almost all the intra and extra-articular components: disc, capsule, posterior ligament of the disc (bilaminar zone) and the superior and inferior bundles of the lateral pterygoid muscle (Figure 5).

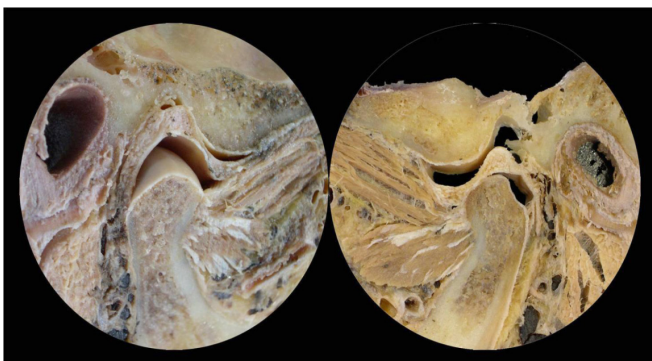


Figure 5 Showing the intra and extracapsular articular components.

Discussion

The textbooks on anatomy generally show TMJ drawings²⁻⁵ or its ultra-structural characteristics;⁶⁻⁸ other publications show its arthroscopic and imaging features.⁹⁻¹³ As we said before, separation of the TMJ in a block results in sacrificing many structures, and dissecting it has been shown to be a difficult task, because in fixed specimens, it is impossible to clearly distinguish the articular capsule from other neighboring tissues, which invariably leads to its loss. A more reasonable alternative would be to evaluate the TMJ structures from the inside to the outside, which presupposes establishing a parasagittal section perpendicular to the long axis and passing through the center of the mandibular condyle. Nevertheless, another problem remains: the sacrifice of many anatomic structures.

Conclusion

The technique presented makes it possible to obtain quality samples of the TMJ, especially preserving the neighboring anatomic structures.

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None.

Conflicts of interest

The authors declare there are no conflicts of interest.

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