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Temporomandibular Joint and Mandibular Movement: A Review Temporomandibular Joint

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Abstract:- This article is a review article that emphasised on basic anatomy of the temporomandibular joint along with its supporting structures. Also,it relates TMJ with mandibular movements. For a good clinical practice it is really important to understand the basic facts.

I. INTRODUCTION

One of the most intricate joints in the body is the TMJ, which is where the mandible and cranium meet. It can be regarded as a ginglymoid joint since it allows hinging movement in a single plane. It is nevertheless categorized as an arthrodial joint since it also permits sliding motions. As a result, it is officially referred to as a ginglymoarthrodial joint.[1] .

One category for the TMJ is complex joints. The TMJ is composed of just two bones, but a compound joint by definition needs the presence of at least three bones. In terms of functionality, the articular disc acts as a non-ossified bone, enabling the intricate joint movements. The craniomandibular articulation is regarded as a compound joint because the articular disc serves as a third bone[1].

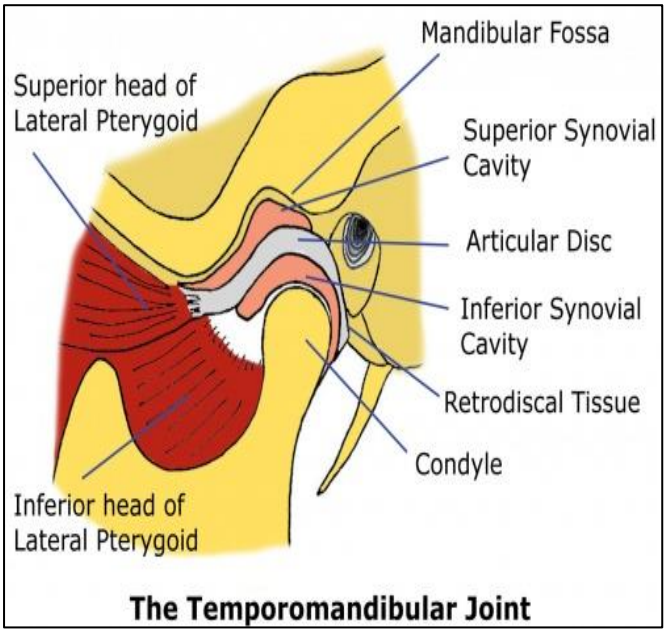

Fig 1 The Temporomandibular Joint

➢ *Capsule –*

The capsule is a fibrous membrane that surrounds the joint and is connected to the mandibular condyle's neck, articular disc, and articular eminence.

➢ *Articular Disc*

The articular disc is a fibrous extension of the capsule that sits between the temporomandibular joint's two articular surfaces. The disc connects to the condyle of the jaw below and the mandibular fossa of the temporal bone above. The disc divides the joint into two portions, each with its own synovial membrane. The collateral ligaments also connect the disc laterally and medially to the condyle. The anterior disc is attached to the superior head of the lateral pterygoid as well as the joint capsule. The posterior segment, also known as the retrodiscal tissue, connects to the mandibular fossa.

➢ *Retrodiscal Tissue –*

In contrast to the disc, retrodiscal tissue is well-innervated and vascularized. As a result, the retrodiscal tissue frequently plays an important role in the pain associated with temporomandibular disorders (TMD), particularly when the joint is inflamed or compressed. The ligaments passively stabilize the TMJ.

The **temporomandibular ligament**, or enlarged lateral region of the capsule, is divided into two parts: an inner horizontal component and an outside oblique portion.

The **stylomandibular ligament** connects the styloid process and mandibular angle **The sphenomandibular ligament** runs from the spine of the sphenoid bone to the lingula of mandible.

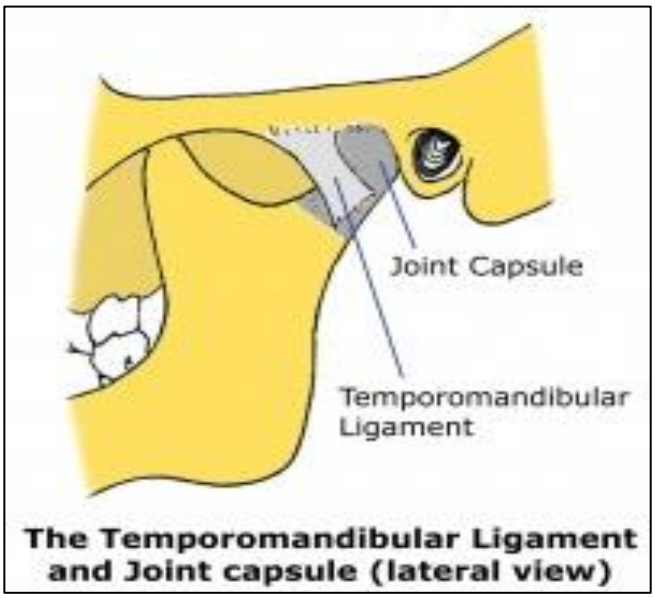

Fig 2 The Temporomandibular Ligament and Joint Capsule (Lateral View)

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II. MOVEMENTS

The TMJ can move in several ways. These movements include mandibular depression, elevation, lateral deviation (both left and right), retrusion, and protrusion. To perform each of these motions, a number of muscles work together while maintaining control over the condyle's position within the mandibular fossa[3]. The TMJ can move both rotationally and translationally.

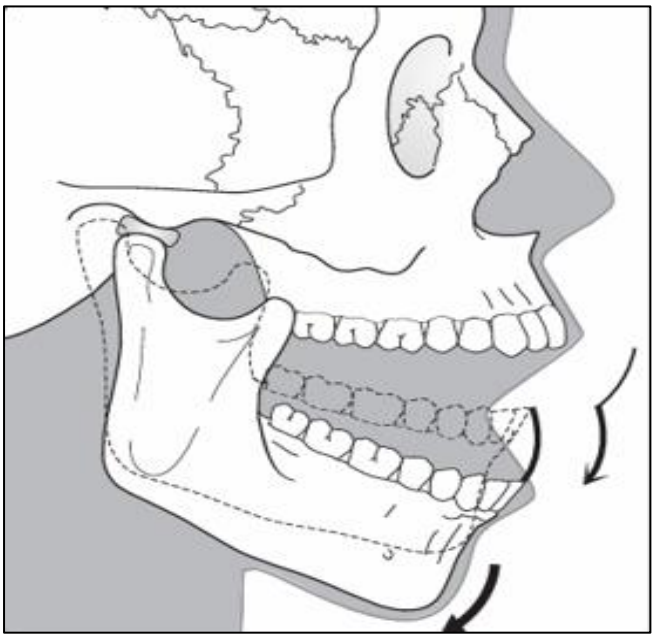

Fig 3 Second Stage of Rotational Movement During Opening.

The condyle is translated down the articular eminence as the mouth rotates open to its maximum limit.

- *Horizontal Axis of Rotation-*

Mandibular movement around the horizontal axis of rotation causes opening and shutting actions. We refer to this movement as a hinge movement..

- *Frontal (Vertical) Axis of Rotation-*

Mandibular movement around the frontal (vertical) axis of rotation occurs when one condyle moves anteriorly away from the terminal hinge position while the opposite condyle's vertical axis remains in the terminal hinge position

- *Sagittal Axis of Rotation-*

When one condyle moves inferiorly while the other remains in the terminal hinge position, mandible movement around the sagittal axis occurs.

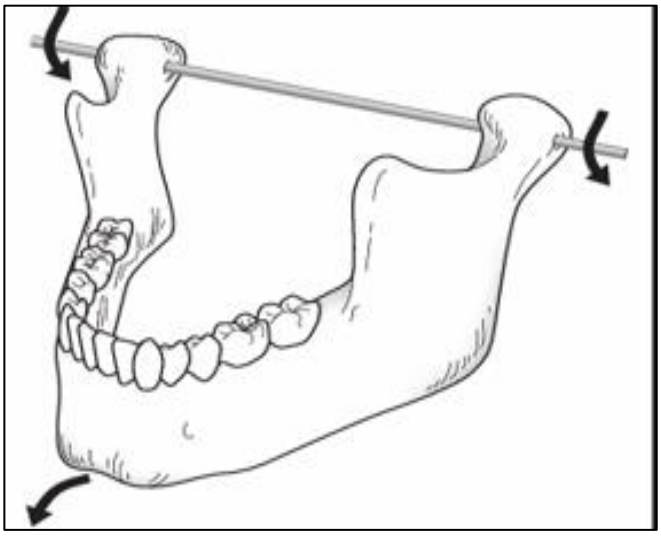

Fig 4 Rotational Movement around the Horizontal Axis.

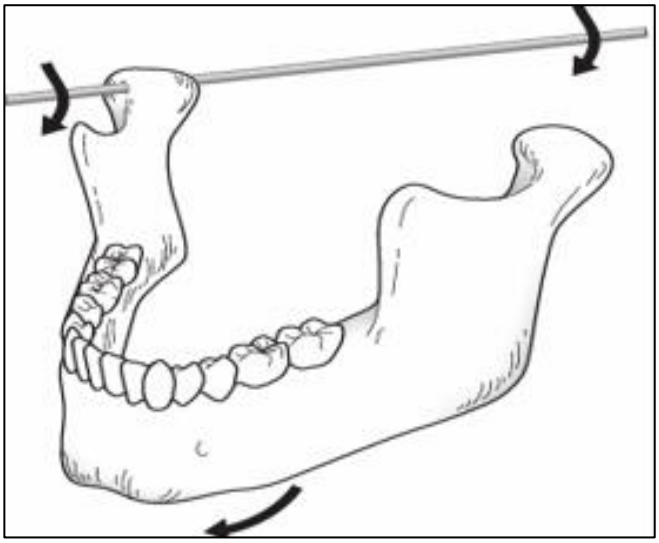

Fig 5 Rotational movement around the frontal (vertical) axis.

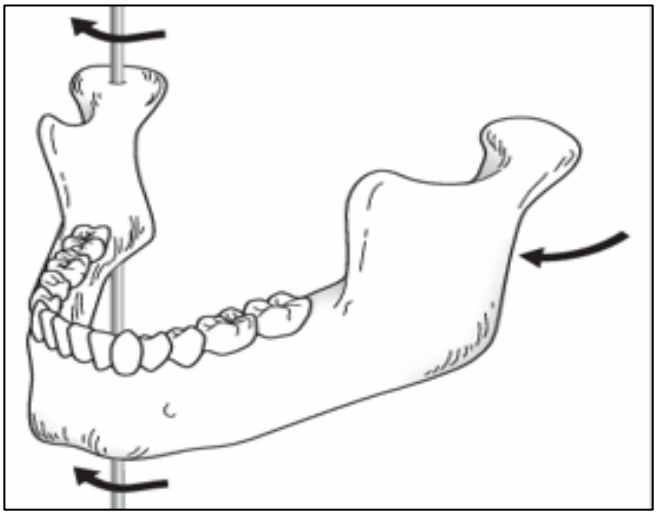

Fig 6 Rotational Movement around the Sagittal Axis.

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III. CONCLUSION

The movement of the jaw is required for many daily tasks, including chewing, speaking, and swallowing. The mandible can move up and down, side to side, and forward and backward due to the precise coordination of muscles, ligaments, and the temporomandibular joint (TMJ). Flexibility is essential for dealing with a wide range of activities and demands. Any limitation in mandibular mobility, regardless of cause (TMJ disorders, trauma, or dysfunctional muscles), can have a significant impact on dental health and overall well-being. To maintain proper mandibular function, keep your jaw aligned, reduce jaw tension, and seek treatment as soon as problems arise. Long-term dental and functional health rely on understanding the mechanics of mandibular movement and taking preventative measures to avoid problems.

REFERENCES

[1]. Dorland's illustrated medical dictionary, ed 30, philadelphia, 2003, saunders, p 1643.
[2]. Lindauer sj, sabol g, isaacaso rj, davidovitch m: condylar movement and mandibular rotation during jaw opening, am j orthod dentofacial orthop 107:573-577, 1995.
[3]. Posselt u: movement areas of the mandible, j prosthet dent 7:375-385, 1957.
[4]. 4. Garnick j, ramfjord sp: an electromyographic and clinical investigation, j prosthet dent 12:895-911, 1962.
[5]. Schweitzer jm: oral rehabilitation, st louis, 1951, mosby, pp 514-518.
[6]. Atwood da: a critique of research of the rest position of the mandible, j prosthet dent 16:848-854, 1966.
[7]. Rugh jd, drago cj: vertical dimension: a study of clinical rest position and jaw muscle activity, j prosthet dent 45: 670-675, 1981.
[8]. Dubrul el: sicher's oral anatomy, st louis, 1980, mosby.
[9]. Mohl nd: head posture and its role in occlusion, n y state dent j 42:17-23, 1976
[10]. Dawson pe. Evaluation, diagnosis and treatment of occlusal problems. 2nd ed. Missouri: mosby elsevier; 2007.
[11]. Temporomandibular joint anatomy, function and clinical relevance
[12]. greg wilkie , ziad al-ani br dent j 2022 oct;233(7):539-546.
[13]. Bender me, lipin rb, goudy sl. Development of the pediatric temporomandibular joint. Oral maxillofac surg clin north am. 2018 feb;30(1):1-9. [pubmed]
[14]. Cuccia am, caradonna c, caradonna d. Manual therapy of the mandibular accessory ligaments for the management of temporomandibular joint disorders. J am osteopath assoc. 2011 feb;111(2):102-12.
[15]. Sencimen m, yalçin b, doğan n, varol a, okçu km, ozan h, aydintuğ ys. Anatomical and functional aspects of ligaments between the malleus and the temporomandibular joint. Int j oral maxillofac surg. 2008 oct;37(10):943-7.
[16]. Mérida-velasco jr, de la cuadra-blanco c, pozo kreilinger jj, mérida-velasco ja. Histological study of the extratympanic portion of the discomallear ligament in adult humans: a functional hypothesis. J anat. 2012 jan;220(1):86-91.
[17]. Bravetti p, membre h, el haddioui a, gérard h, fyard jp, mahler p, gaudy jf. Histological study of the human temporo-mandibular joint and its surrounding muscles. Surg radiol anat. 2004 oct;26(5):371-8.