**ORAL HISTOLOGY**

**TEMPROMANDIBULAER JOINT**

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 The TMJ is a synovial bilateral joint that permits the mandible

to move as a unit with 2 functional patterns (gliding and hinge movements).



 **Translatory movement** – in the superior part of the joint as the disc and the condyle traverse anteriorly along the inclines of the anterior tubercle to provide an anterior and inferior movement of the mandible.



Mouth closed Mouth open

**Hinge movement** – the inferior portion of the joint between the head of

the condyle and the lower surface of the disc to permit opening of the mandible

**4 anatomical parts** concerned with mandibular articulation:

Mandibular condyle

Mandibular fossa and articular eminence

The articular disc

The articular capsule



 The mandibular condyle articulates with the glenoid fossa and articular

eminence of the temporal bone.

 An articular disc separates the articular surfaces so that 2 cavities are

present:

 Upper compartment between the disc and temporal bone.

 Lower compartment between the condyle and the disc

 The joint capsule is attached below to the articular margin of the head of the condyle, and above to the margins of the glenoid fossa and articular

eminence. The inner aspect of the capsule is lined by a synovial membrane.

 At the sides, the capsule is strengthened by collateral ligaments of which the lateral temporomandibular ligament is the strongest.

 The lateral temporo-mandibular ligament is attached above to the zygoma, and below, it is attached to the lateral surfaces and posterior border of the neck of the mandible.

 There are **2 accessory ligaments** associated with the TMJ:

 The stylomandibular ligament attaches to the styloid process and to the

posterior border of the ramus.

 The sphenomandibular ligament extends between the spine of the

sphenoid bone and the lingula of the mandible.

 These ligaments limit the range of movement of the condyle preventing it

from coming in contact with the tympanic plate behind and passing beyond the articular eminence in front.

**THE MANDIBULAR CONDYLE**

 It’s the articulating surface of the mandible.

 It is convex in all directions but wider

latero-medially than antero-posteriorly.

 It has lateral and medial poles:

 The medial pole is directed more posteriorly.

 The long axis of the two poles deviate

posteriorly and meets at the anterior border of the foramen magnum.

**MANDIBULAR (GLENOID) FOSSA AND ARTICULAR**

**EMINENCE**

 Glenoid fossa:

 Posteriorly limited by the squamotympanic fissure.

 Anterioly bounded by the articular eminence.

 Roof: thin layer of compact bone separating the middle

cranial fossa.

 Articular eminence:

 Composed of: Spongy bone

covered by thin layer of compact

bone.

 Chondroid tissues commonly seen in the eminence.



 Fibrous layer covering the articulating surface of temporal bone.

 Thin on the articular fossa and thickens on the posterior slope of the

eminence

 Over the eminence the fibrous tissues are arranged in 3 zones:

Inner zone – fibers arranged at right angle to surface

Outer zone – fibers run parallel to the bone surface

Intermediate zone – transitional zone. Fibers are interlaced.

Interarticular disc (Meniscus)

 Disk is fibrous, avascular, non inverted plate

 Shape is oval, biconcave in sagittal section. It is thin in central part and

thick at posterior borders.



**ARTICULATING CAPSULE AND LIGAMENTS AND**

**SYNOVIAL MEMBRANE**

 The whole TMJ is enclosed in a fibrous capsule.

 It is attached to:

 Articular tubercle (in front)

 Lips of squamous tympanic fissure

(posteriorly)

 Borders of articulating glenoid fossa

 Neck of the mandible. (below)

 It is lined by synovial membrane.

 Laterally, the capsule is reinforced by TMJ ligaments.

 **Synovial membrane** is very rich in blood supply and contains lymphatic vessels

**Synovial fluid**

 It is clear, straw-colored viscous fluid.

 It diffuses out from the rich cappillary network of the synovial membrane.

Contains:

 Hyaluronic acid which is highly viscous

 May also contain some free cells mostly macrophages.

Functions:

 Lubricant for articulating surfaces.

 Carry nutrients to the avascular tissue of the joint.

 Clear the tissue debris caused by normal wear and tear of the articulating surfaces

**Blood supply**

 4 arteries supply the joint:

 Superficial temporal

 Deep auricular

 Anterior tympanic

 Ascending pharyngeal

 Branches from the 4 approach the joint and penetrate the capsule.

**Nerve supply**

 Branches from the mandibular nerve

 Auriculotemporal nerve

 Masseteric nerve

 Deep temporal nerves

 Supply all surfaces of the head, fossa, capsule and part of the disk.

**AGE CHANGES**

 **Condyle:**

 Becomes more flattened

 Fibrous capsule becomes thicker.

 Osteoporosis of underlying bone.

 Thinning or absence of cartilaginous zone.

 **Disk:**

 Becomes thinner.

 Shows hyalinization and chondroid changes.

 Synovial fold:

 Become fibrotic with thick basement membrane.

 Blood vessels and nerves:

 Walls of blood vessels thickened.

 Nerves decrease in number

**Changes could lead to:**

 Dysfunction in old age

 Impairment of motion due to decrease in the extensibility of the disk and the capsule.

 Decrease in the secretion of the synovial fluid.