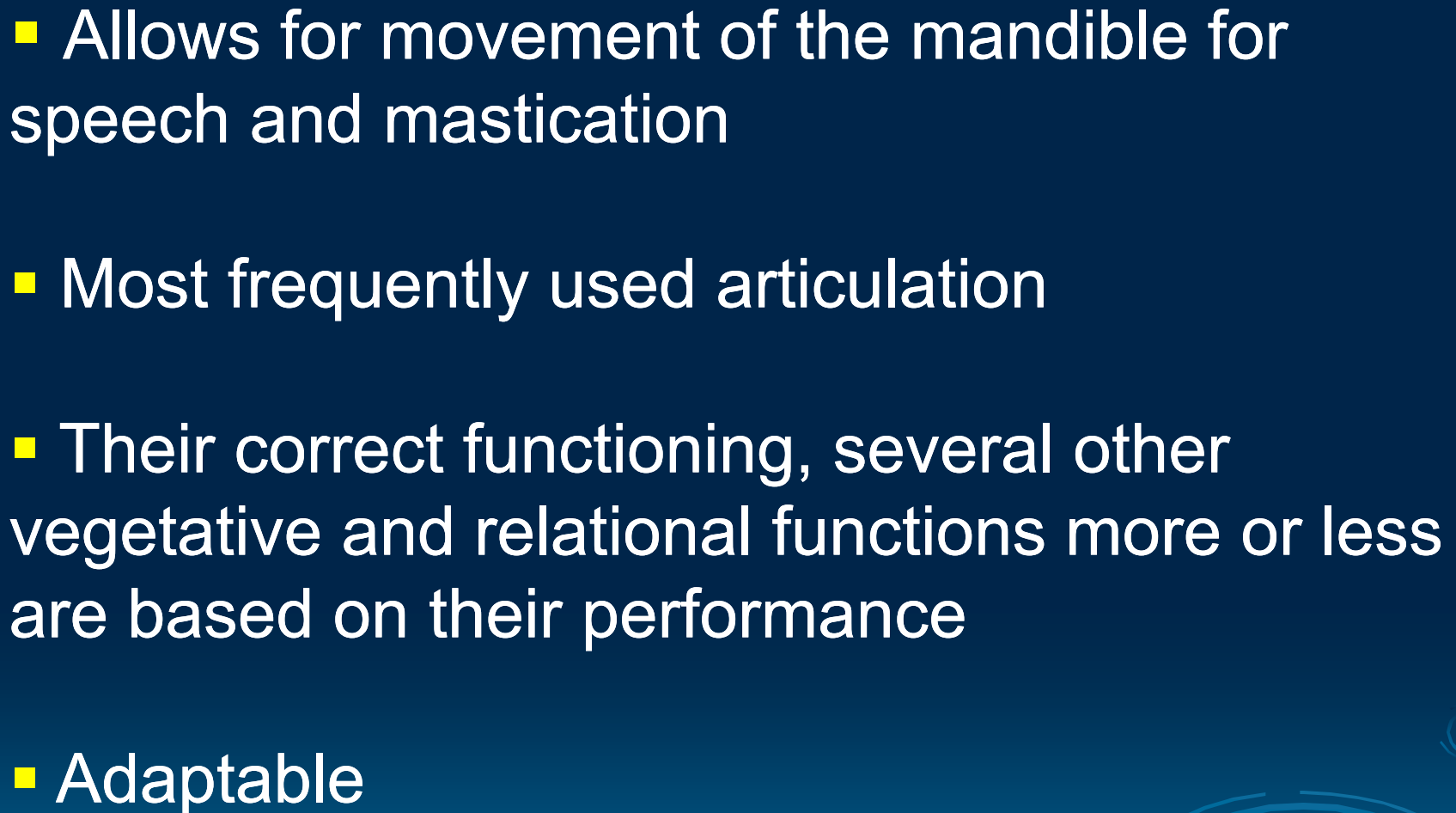


ARTICULATIO TEMPOROMANDIBULARIS

Temporomandibular joint



- Allows for movement of the mandible for speech and mastication
 - Most frequently used articulation
 - Their correct functioning, several other vegetative and relational functions more or less are based on their performance
 - Adaptable
- 

1. ARTICULAR SURFACES

2. JOINT CAPSULE

3. DISCS OF THE JOINT

4. LIGAMENTS

5. JAW MOVEMENTS

6. INERVATION

7. ARTERIAL SUPPLY

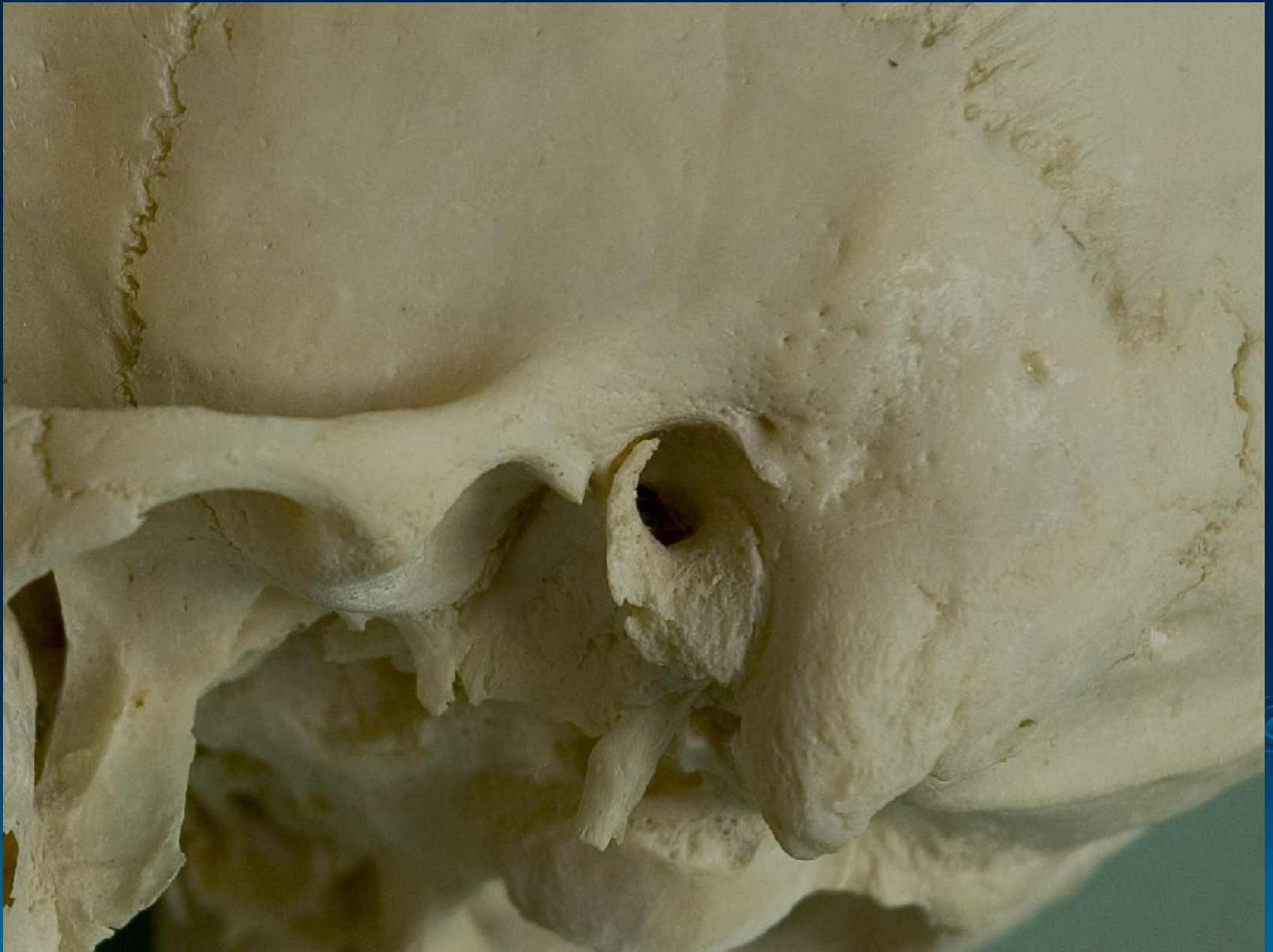
8. EXAMINATION OF THE JOINT

9. TOPOGRAPHY RELATIONSHIP

1. ARTICULAR SURFACES

- The articular fossa
- The articular eminence
- The postglenoid process
- The head of the condyle







Angle 130 - 180

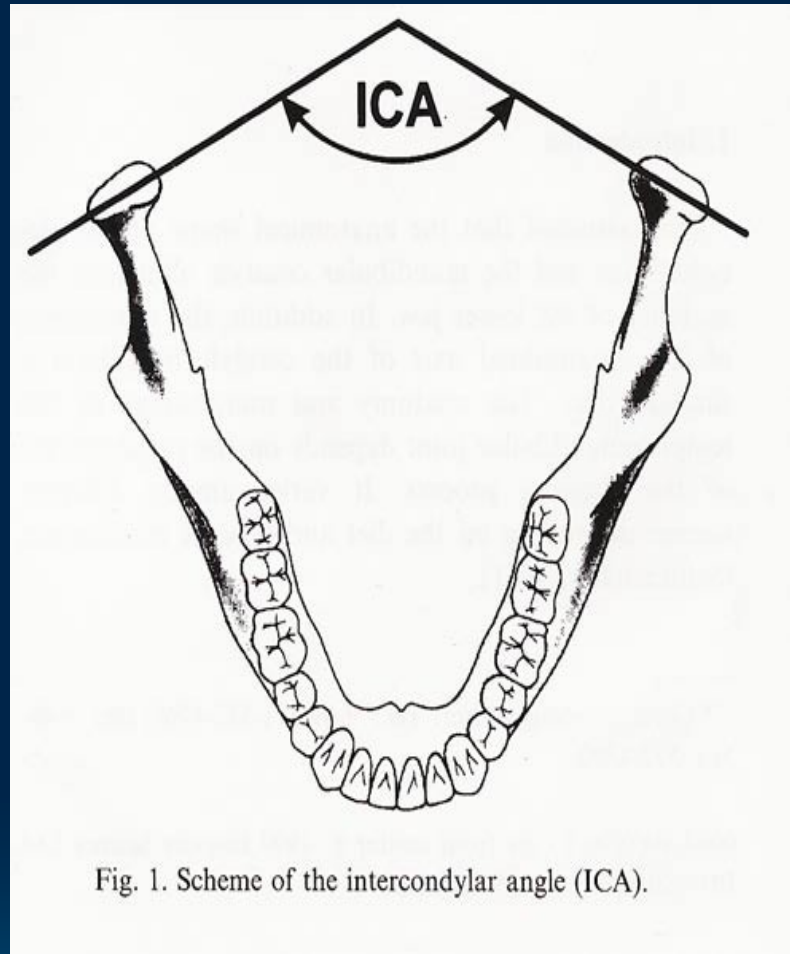


Fig. 1. Scheme of the intercondylar angle (ICA).

http://www.dr-wolter-kfo.de/pdf/mandibular_1999.pdf

2. JOINT CAPSULE

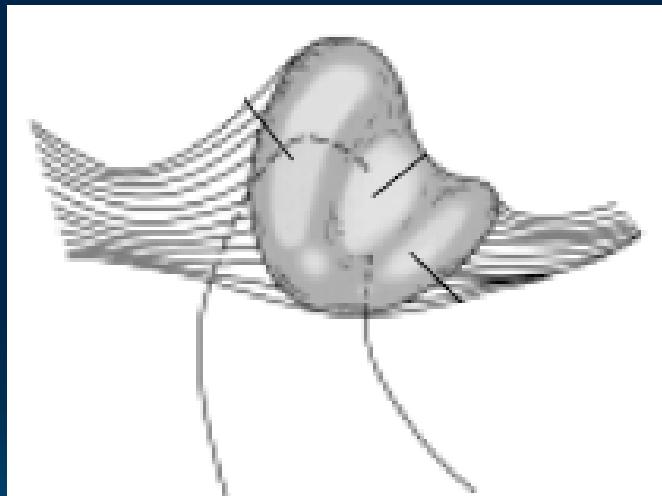
- A thin **fibrous**
- Cone-shaped
- The **medial** and **lateral** walls are reinforced by the medial and lateral ligaments



- **The superior capsular attachments** are relatively loose → translate forward on mandibular depression
- **The inferior attachments** are more tightly bound to the capsule → translate forward with the condyle during mandibular depression
- The inner surface are covered by **synovial membrane** → synovial fluid → nutrients to avascular cartilage and to reduce a friction

3. DISC OF THE JOINT

- An oval, firm, fibrous plate that lies between the head of the mandibule, mandibular fossa and articular tubercle



- Reduce sliding friction and to dampen load spikes and allow the mouth open and close

Articular surface are separated by disc to:

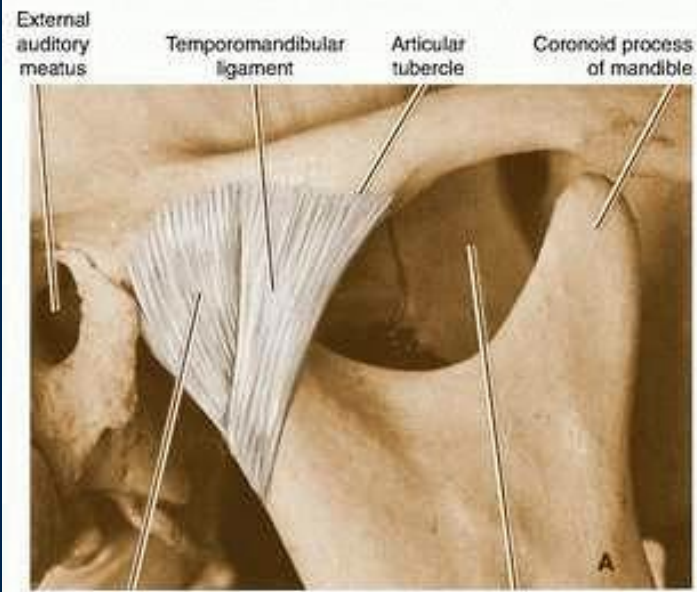
1. **upper compartment**

between the disc and mand. fossa (1,2ml)

2. **lower compartment**

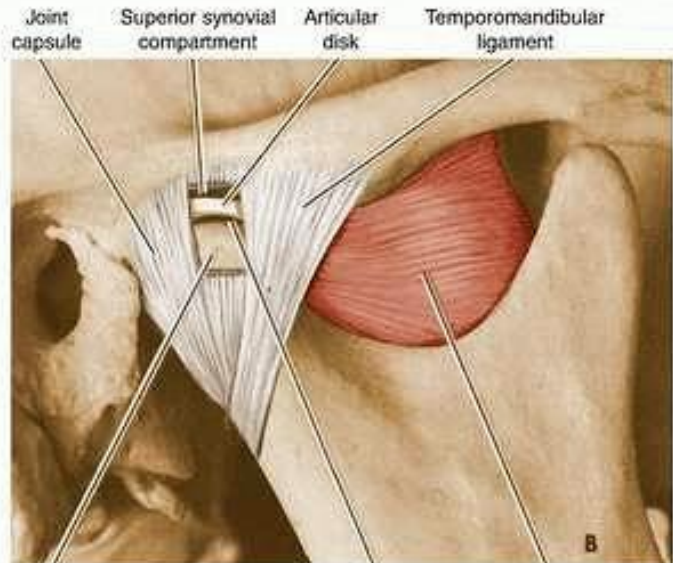
between the condyle and the disc (0,9ml)





Joint capsule

Lateral pterygoid plate of sphenoid bone



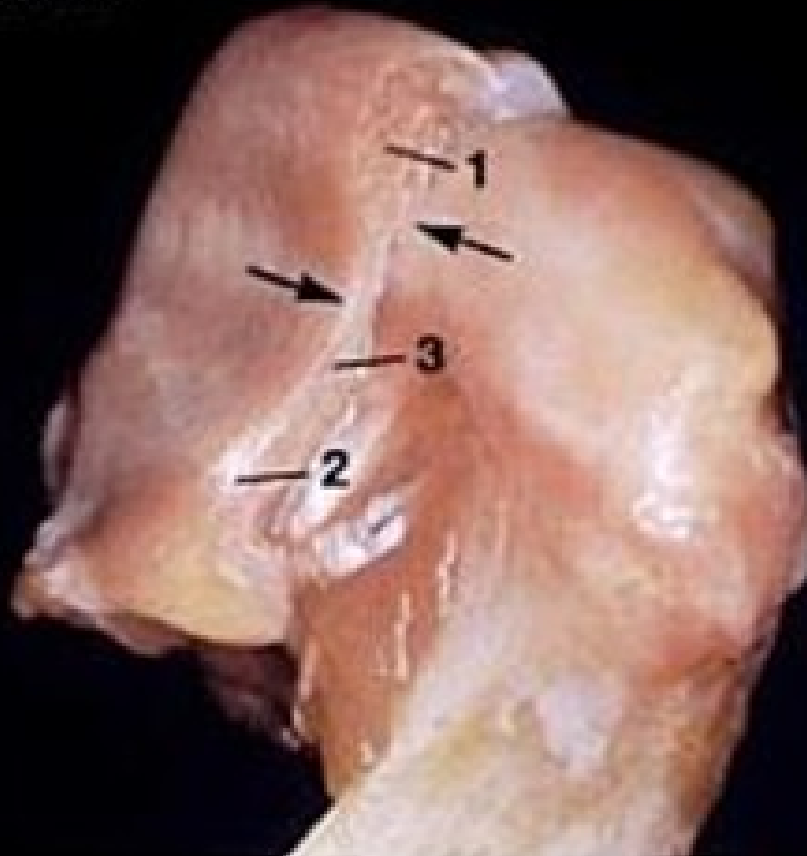
Head of condyle

Inferior synovial compartment

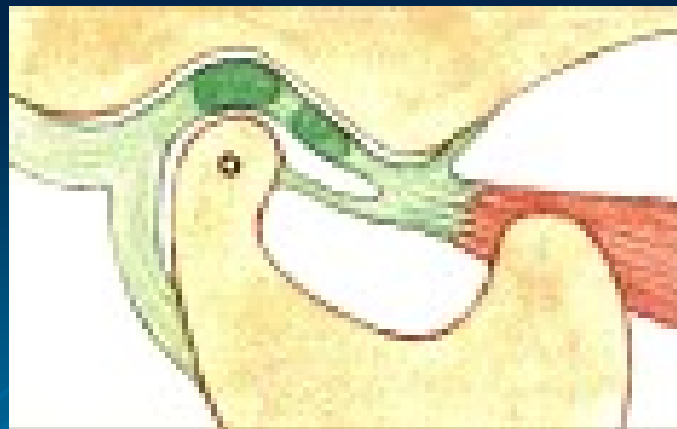
Lateral pterygoid muscle

- Disc is biconcave with fibrocartilaginous structure
- Matrix of disc consists primarily of collagen and elastic fibres
- In the pars anterior and posterior run transverse collagen fibres
- Based upon the function is divided into **anterior**, **intermedia** and **posterior** partes

5 mm

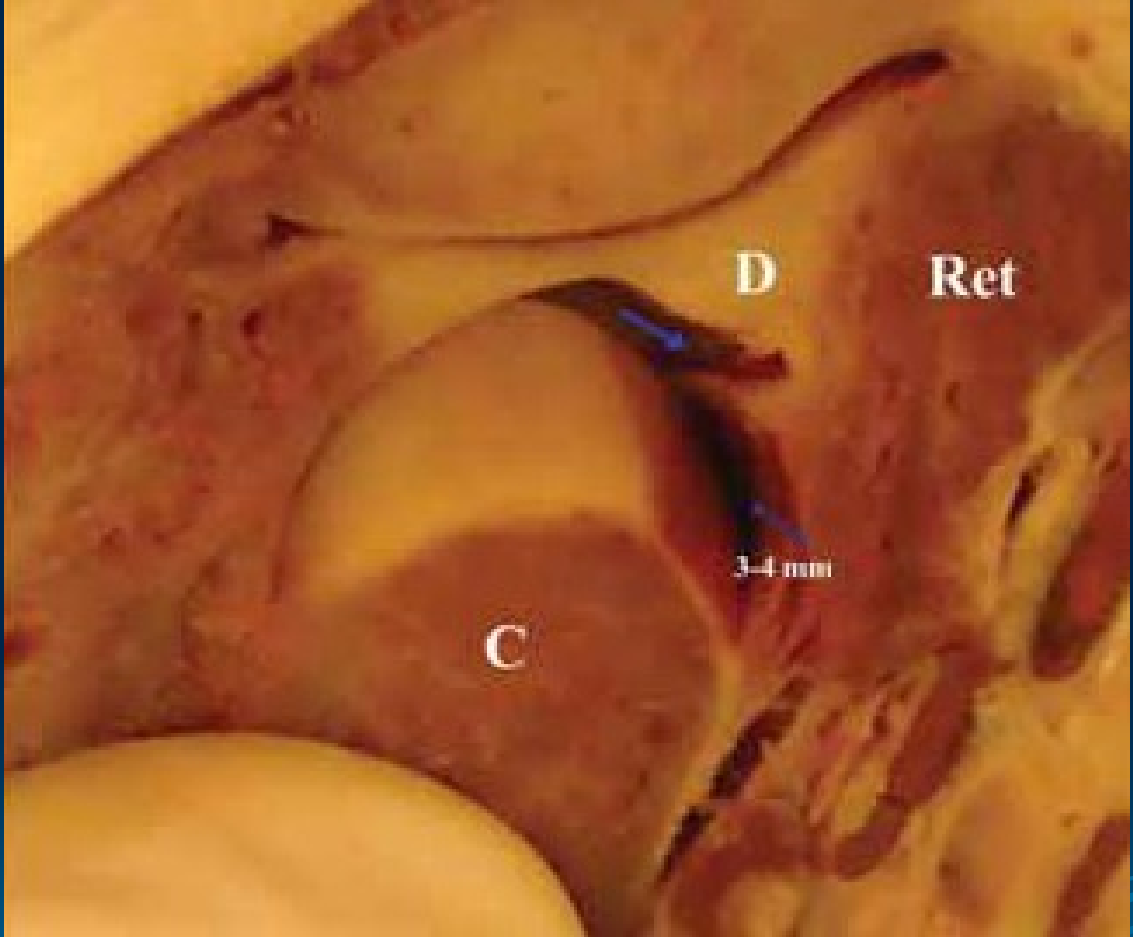


- Posterior part of the articular disk, so-called **bilaminar**, separates into **upper** and **lower laminae** of collagen fibres both insert into the posterior wall
- Between these laminae and the posterior wall is filled with **retroarticular Zenker plastic pad**



Retroarticular Zenker plastic pad

- The posterior part becomes gradually looser and is continuous with the loose connective tissue and the fat lobules filling the retroarticular space
- The connective tissue contains a **venous plexus, numerous nerve fibres and fat** (pterygoid plexus and auriculotemporal nerve)



The pad is responsible for stabilizing the disc on the condyle and supplying the joint

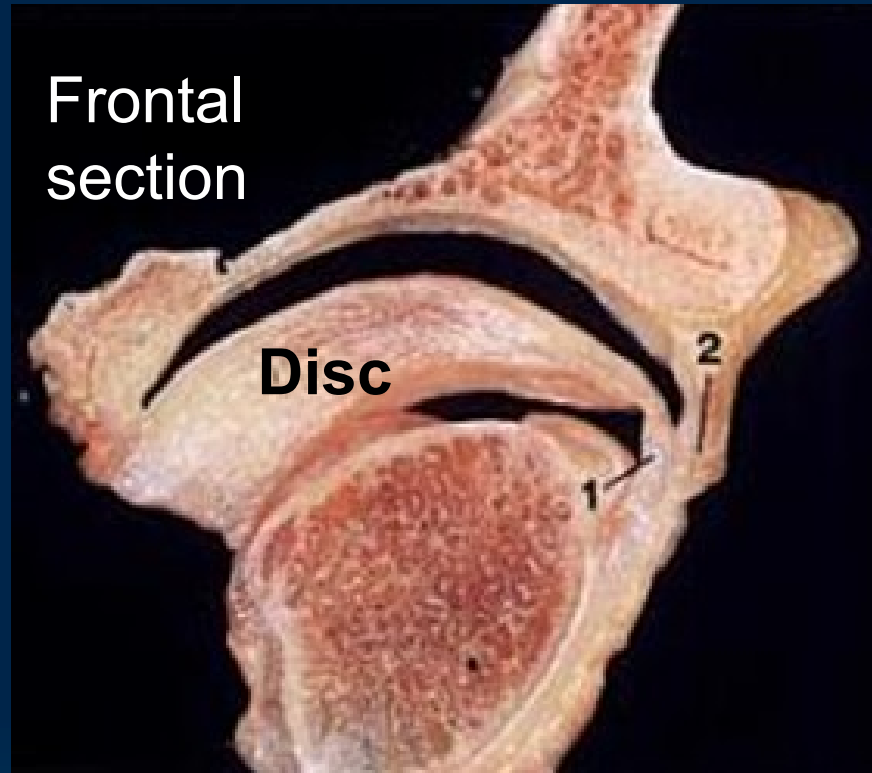
On opening

a Zenker plastic pad of retrodiscal tissue **filled the space between the posterior thick part of the disc and the condyle** as a result of negative pressure

On closing

the **blood is pushed out** the retromandibular vein

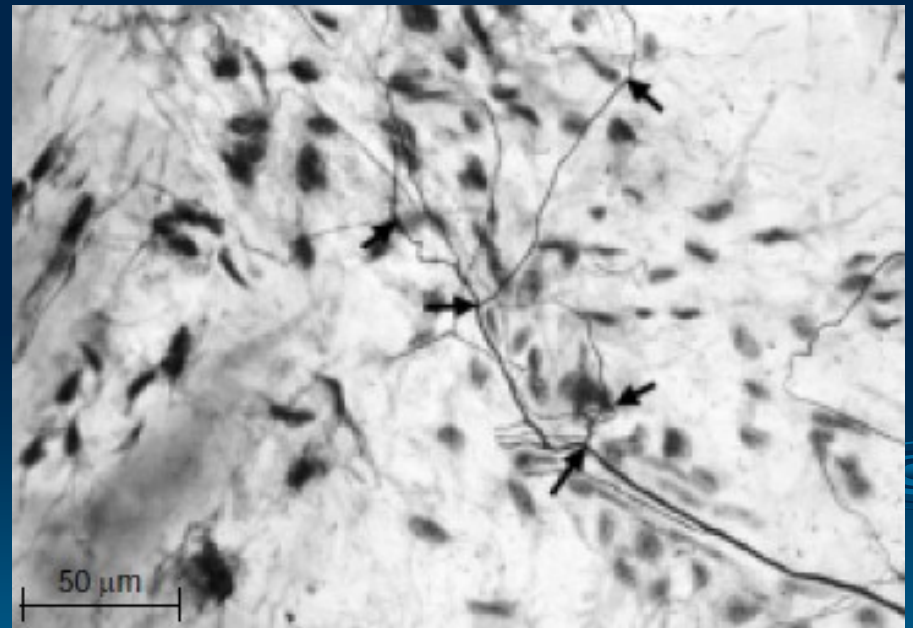
Attachment of articular disc




Medially and **laterally** is the disc attached to the **inner periphery** of the articular capsule → **tightly bound** to the capsule, causing the disc to translate forward with the condyle during depression

Innervation of articular disc

- The nonmyelinated and the myelinated nerve
- Free nerve endings
- Sensory nerve end organs



Physiologic disc position

- Pars **posterior** of the disc lies on the superior portion of the condyle
 - In the **centric condylar position** the pars **intermedia** is located between anterosuperior convexity of the condyle and the articular protuberance
 - Pars **anterior** lies in front of condyle
- 

Dislocation of the articular disc

- Displacements of the disc in the **anterior anteromedial**, or **anterolateral** direction
- Posterior disc displacement - on rare occasions
- With or without **reduction**
- The combination of ant. and lat. or medial displacement is called **rotational displacement**
- Pure lateral or pure medial displacement is called **sideways displacement**

- Chronic displacement is resulting in **deformity of the disc**

- In approximately 10% of patients presenting with pain and dysfunction



Trauma of the articular disc



Microtrauma

bruxism, stress, malocclusion, bad habits, chewing gum

Macrotrauma

an injury - either directly to the joint or to the head and neck intubation, lengthy dental work

4. LIGAMENTS OF THE TMJ

Ligaments have three main functions:

a) stabilization

b) guidance of movement and

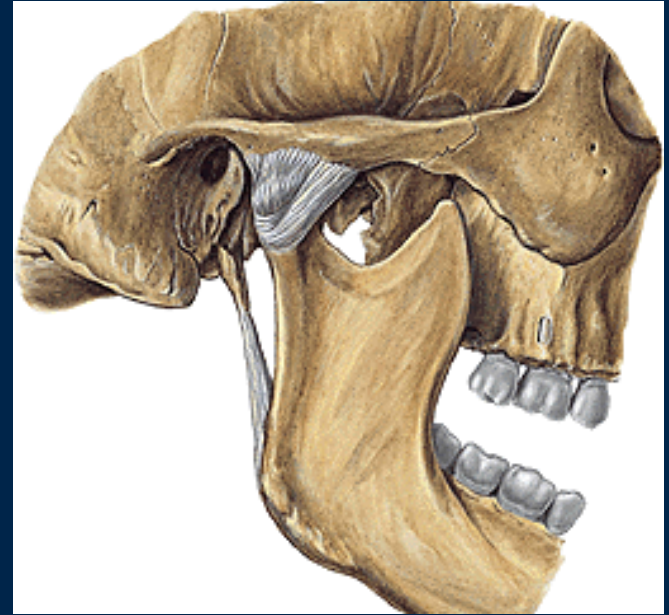
c) limitation of movement

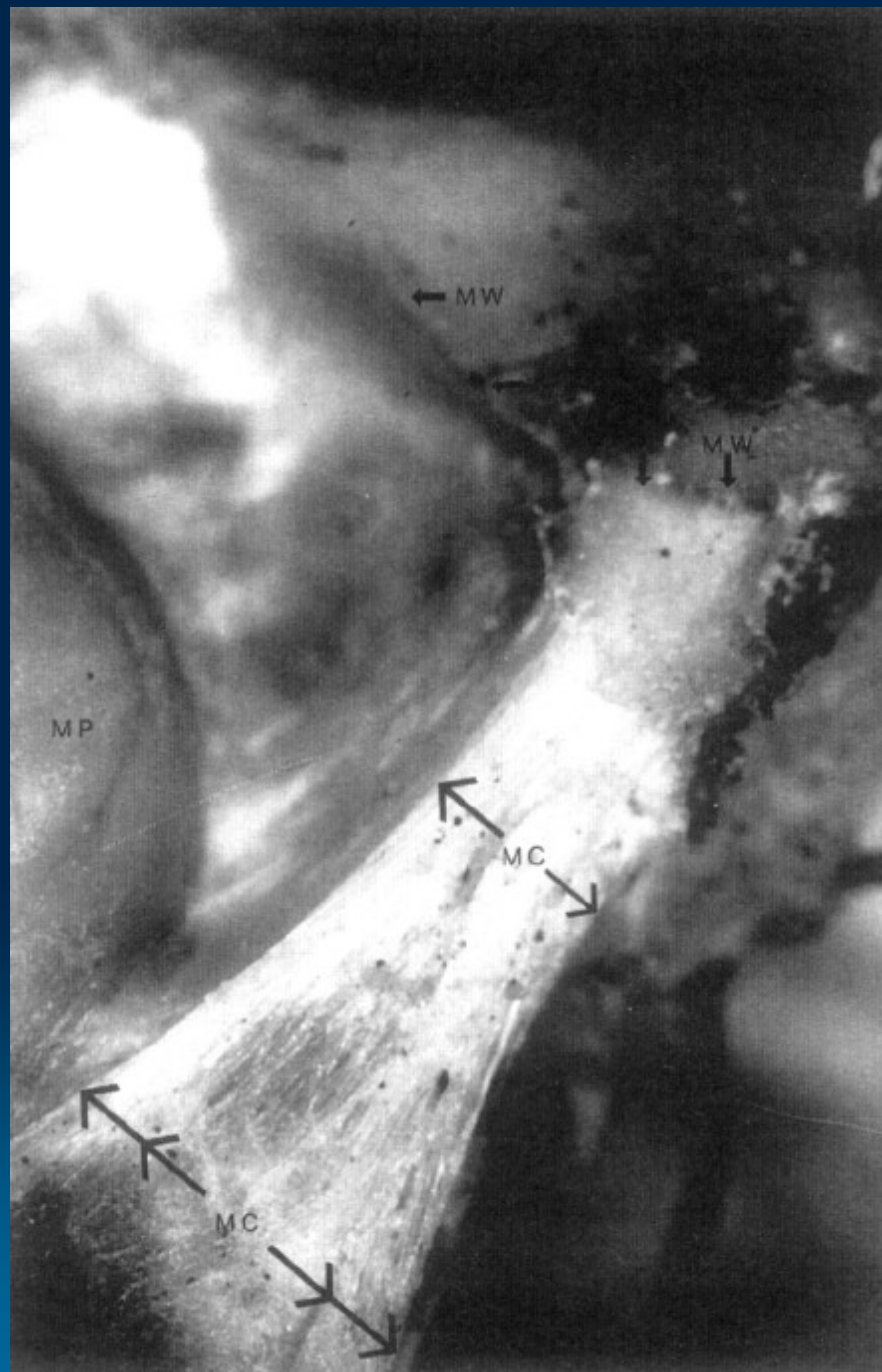
- Articular: **lateral**
medial
- Extraarticular **stylomandibular**
sphenomandibular
- Discomalleolar (Pinto's) + Tanaka's ligament

Lateral ligament

From processus zygomaticus
and articular tubercle
→ mandibular neck

- A **superficial**, more **vertically** oriented part limits jaw opening
- A **deep**, more **horizontal** part limits retrusion and laterotrusion





Medial surface of
articular capsula
with **medial lig.**

Stylomandibular ligament

From styloid process →
the posterior edge of the
angle of the mandible

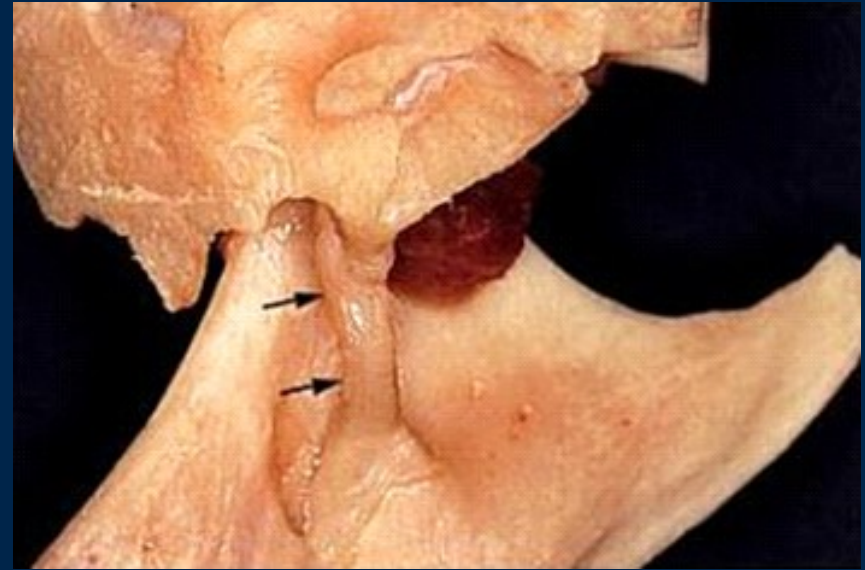
- Restricts **protrusive** and **mediotrusive** movements + prevent excessive upward rotation



Sphenomandibular ligament

From sphenoidal spine
→ lingula of the mandible

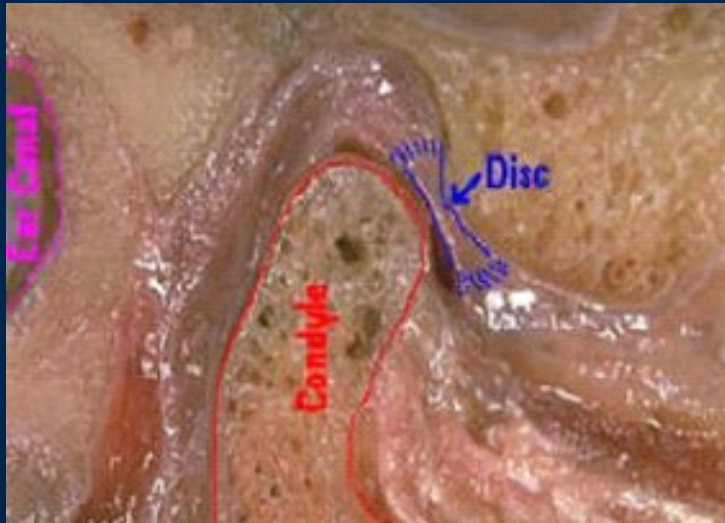
- Limits **protrusive** and **mediotrusive** movement
+ passive jaw opening



Diskomaleolar (Pinto's) ligament

- Connection between the malleus and the medial wall of the articular capsule and disc
- Passes through the squamotympanic fissure to the middle ear
- Caused the tinnitus and secondary inflammation of temporomandibular joint

5. MOVEMENTS OF THE TMJ



Hinge movement - type of rotation takes place in the **lower** compartment between the stationary disc and the moving condyle

Gliding movement - takes place in the **upper** compartment between the superior surface of the disc, which is moving, and mandib. fossa

Depression - the opening

Lateral pterygoid + supra- and infrahyoid m.

- With simple rotation at the joint can be achieved 15 - 20mm intericisor distance
- During translation, the disc and condyle move under the articular eminence

Elevation - the closing

Temporal + masseter + medial pterygoid m.

- Translation - the condyles move backward and upward along the articular eminence
- Rotation upward to attain centric position



Protrusion

Lateral et medial pterygoid + masseter m.

- Slide the mandible forward
- Maximal protrusion results in the lower incisors being a few mm anterior to the maxillary incisors

Retrusion

Temporal + masseter m.

- Move the mandible posteriorly
- Condyles move backward and upward and reoccupy the mandibular fossa

Laterotrusion

Lateral et medial pterygoid + masseter + temporal m.

The condyle move to the right or to the left side

During lateral movements,

the each of condyle moves differently:

on **the working side** - rotates around a vertical axis and moves lat. and ant.

on the **nonworking side** - ant., inf. and med.

Hyper mobility

Subluxation

Self-reducing, incomplete dislocation of a joint in which the patient is able to close his or her mouth without assistance

Luxation (true dislocation)

Joint is displaced from its articulations and requires manipulation by another individual to return to its normal position



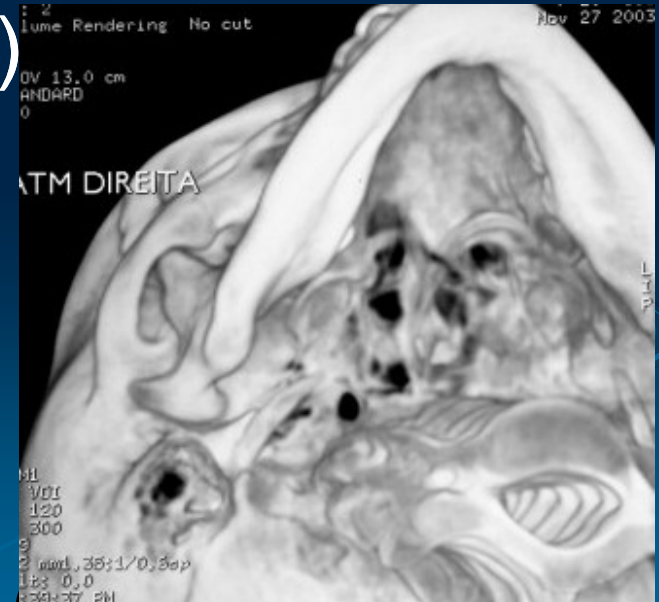
Hypo mobility

Ankylosis (intracapsular)

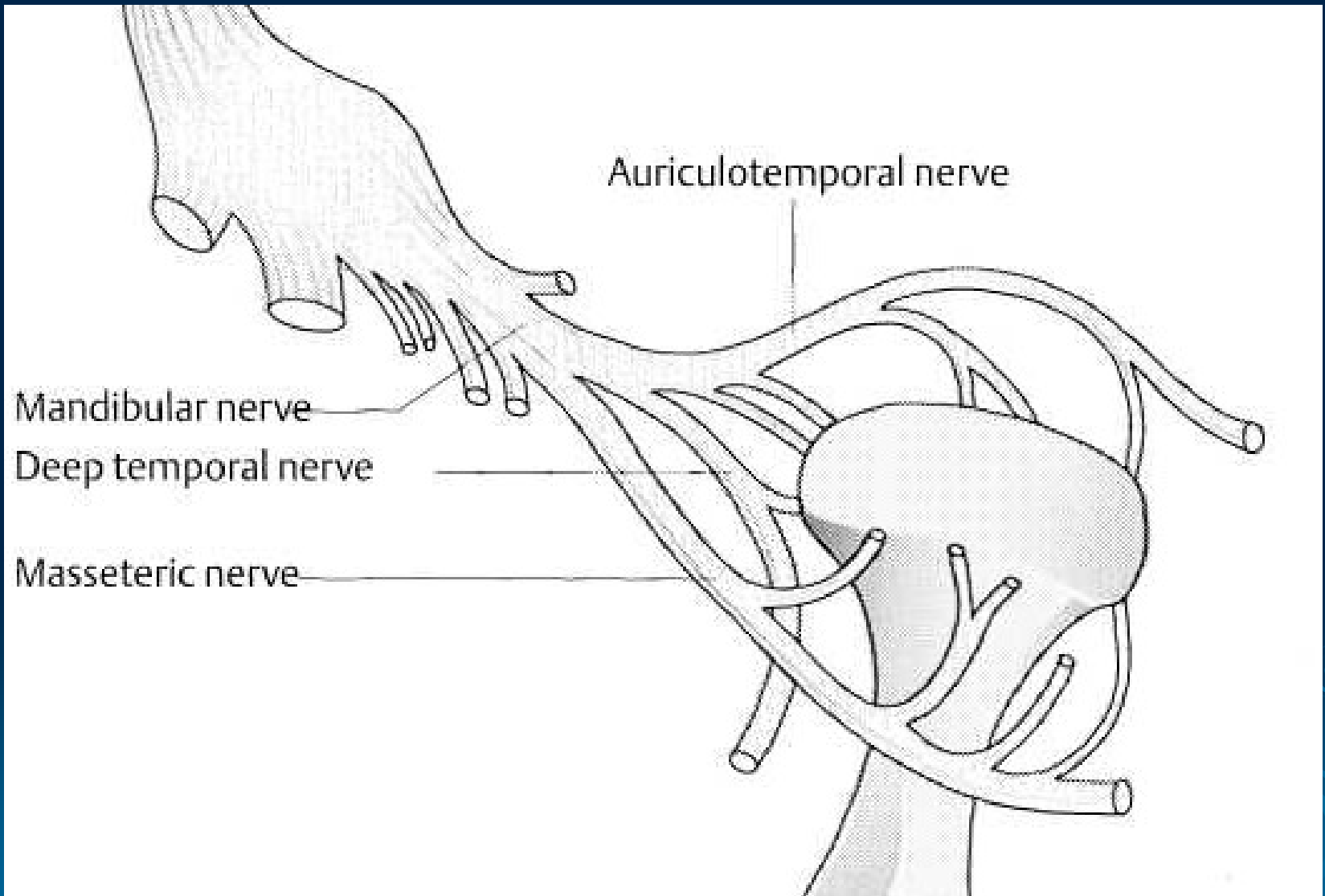
The fibrous adhesions or bony fusion between condyle, disc, glenoid fossa, and eminence

Pseudoankylosis (extracapsular)

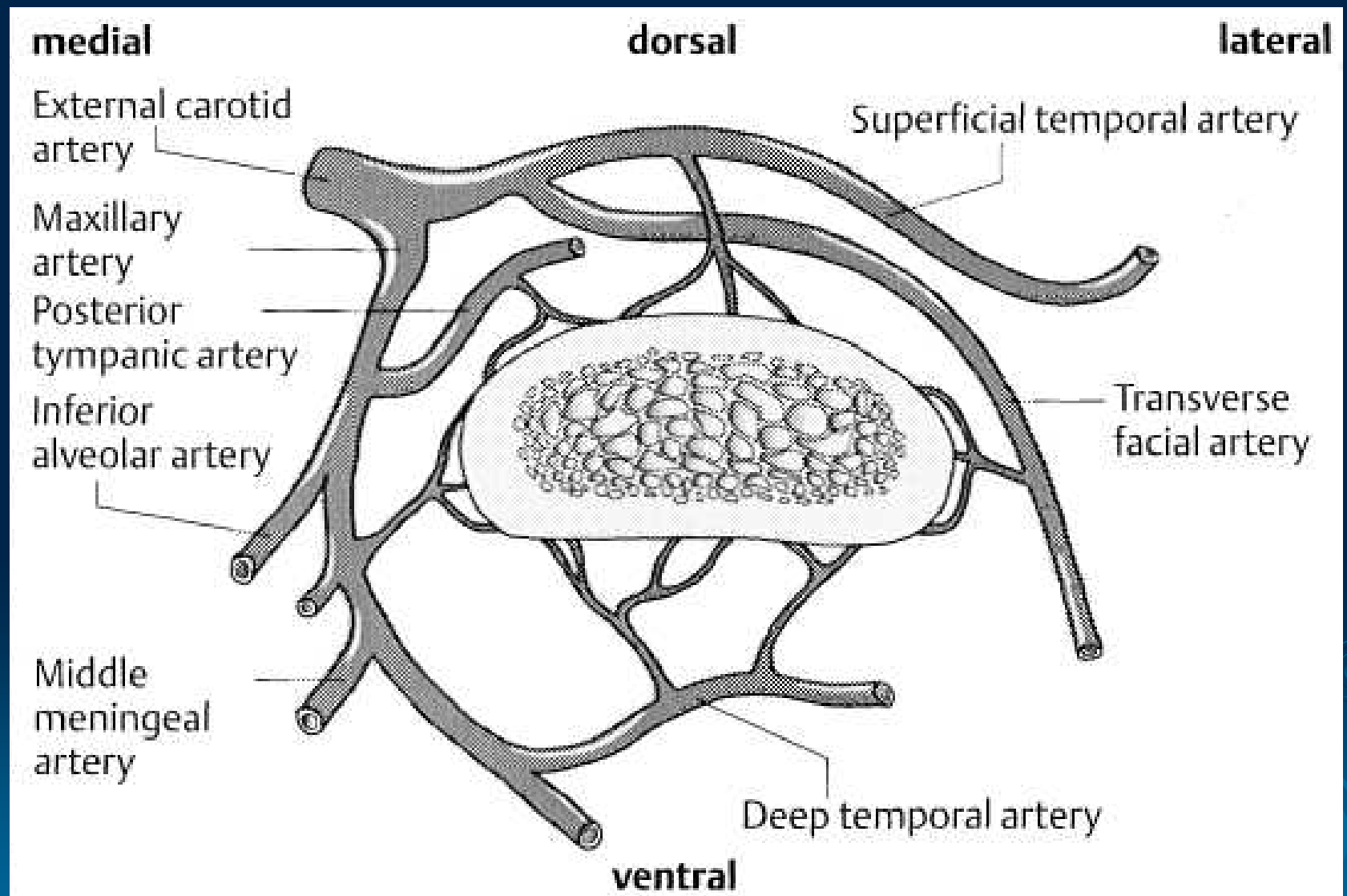
Pathology extrinsic to the joint



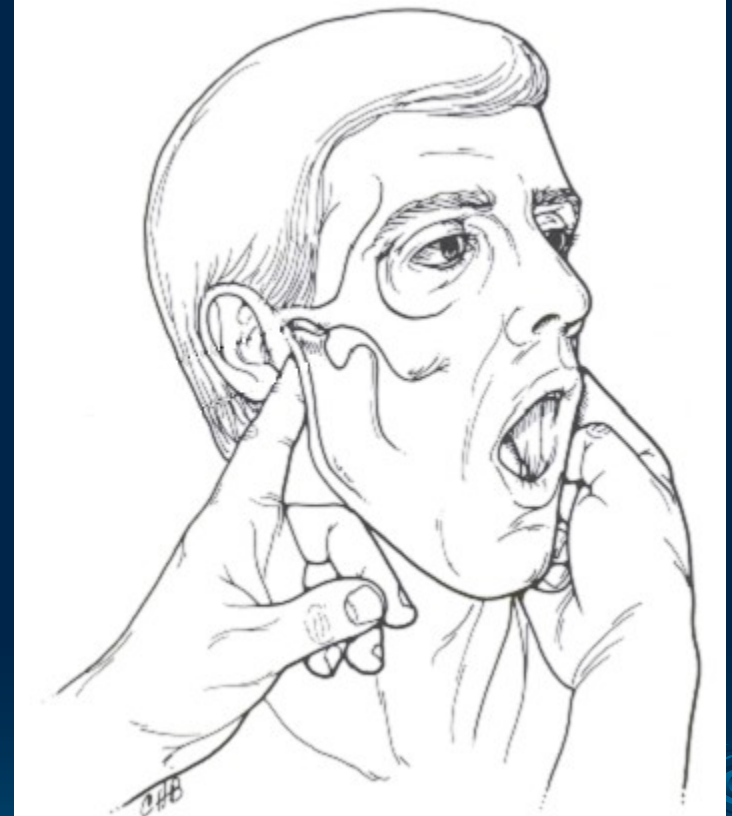
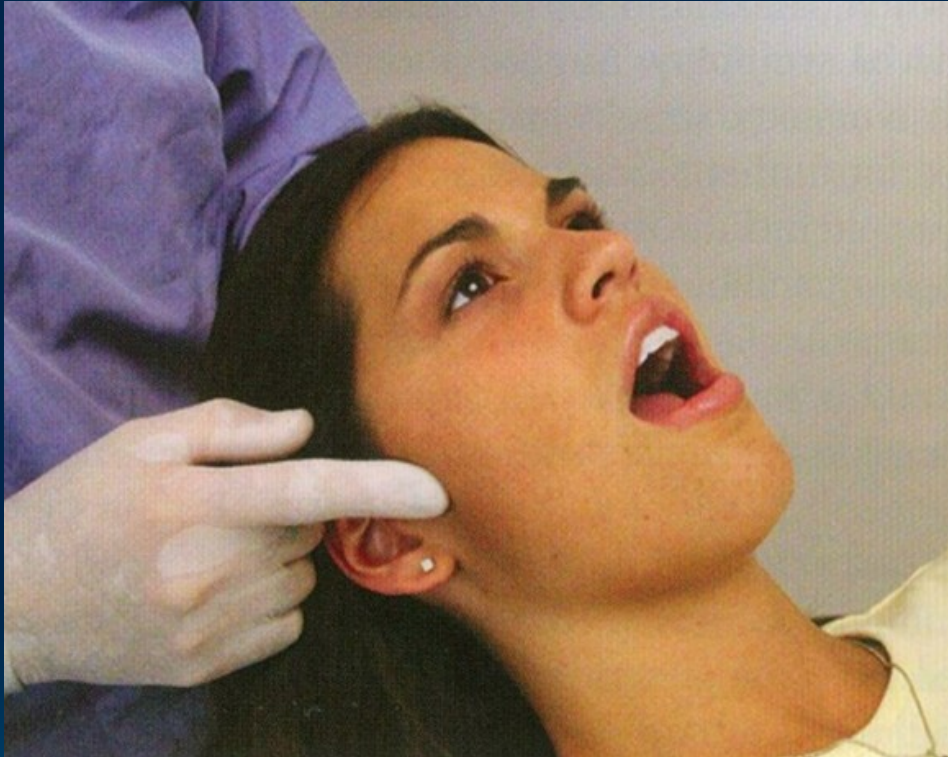
6. INERVATION OF THE TMJ



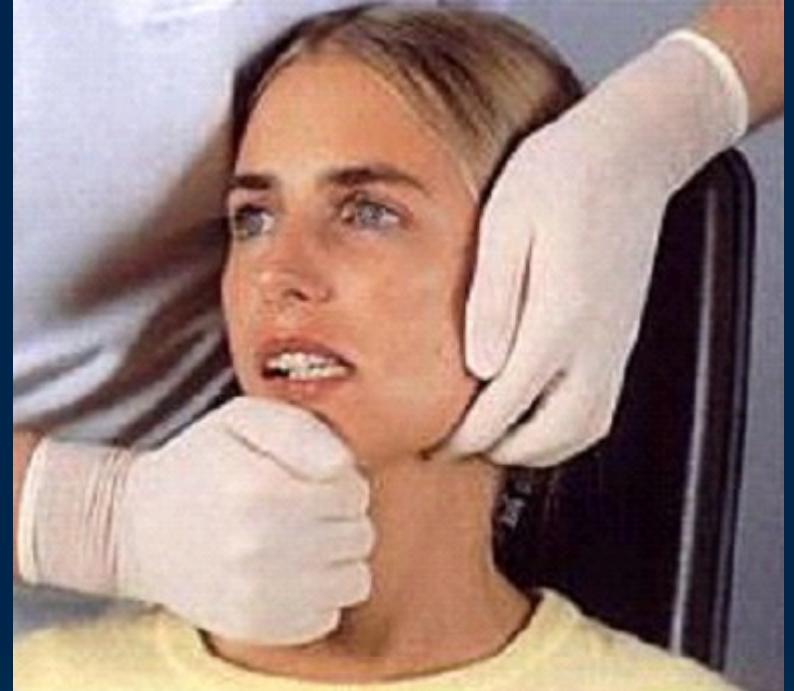
7. ARTERIAL SUPPLY OF THE TMJ



8. EXAMINATION OF TMJ



Palpation of the preaurikular area



Posterolateral and posterosuperior **compression**



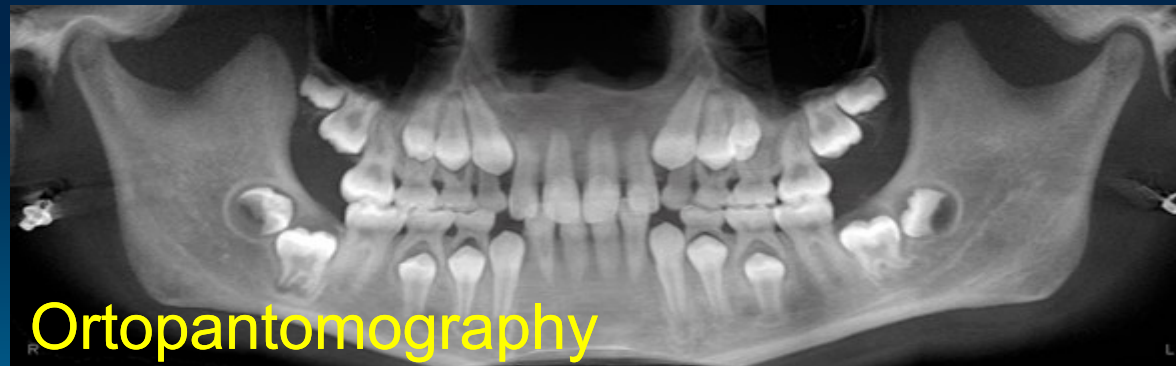
Imaging procedures



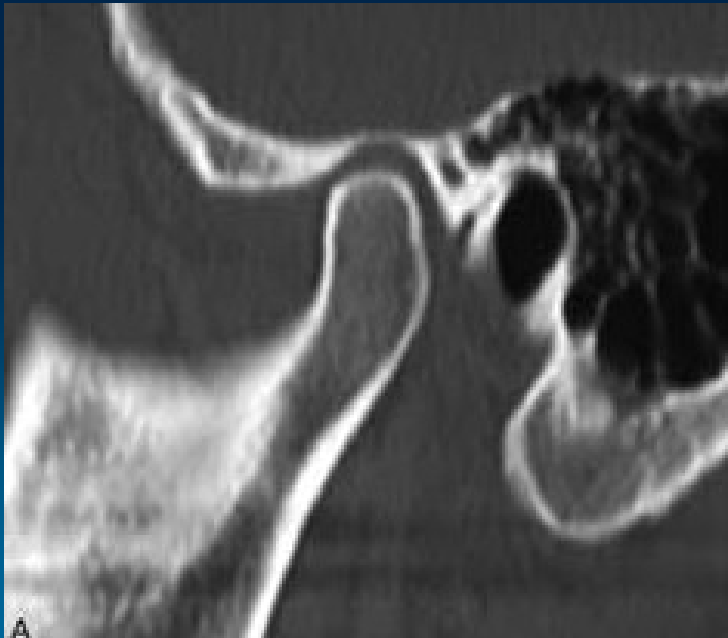
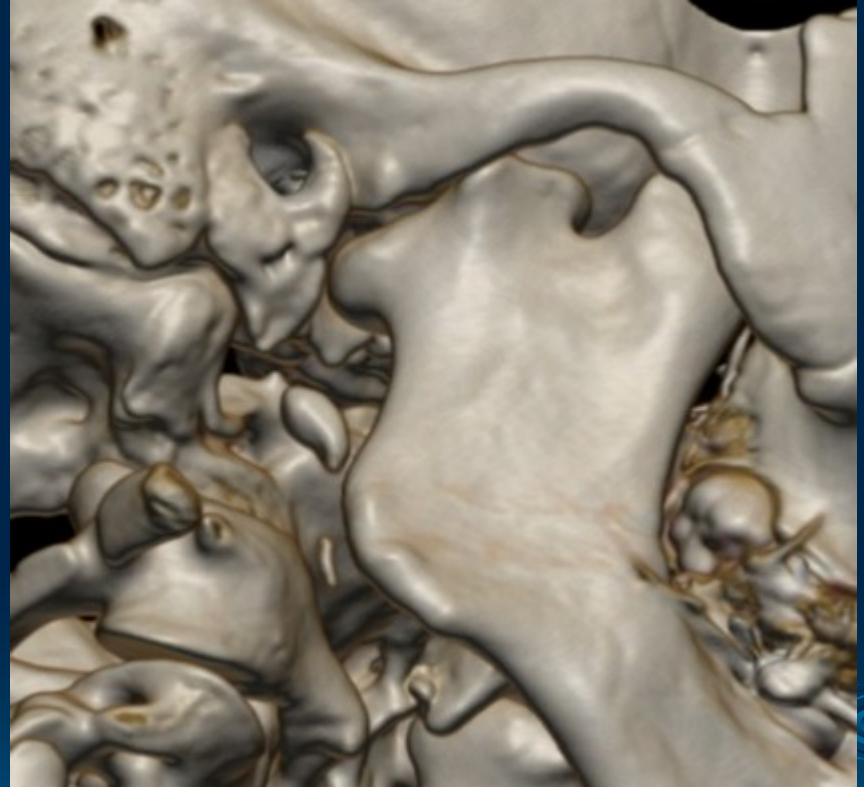
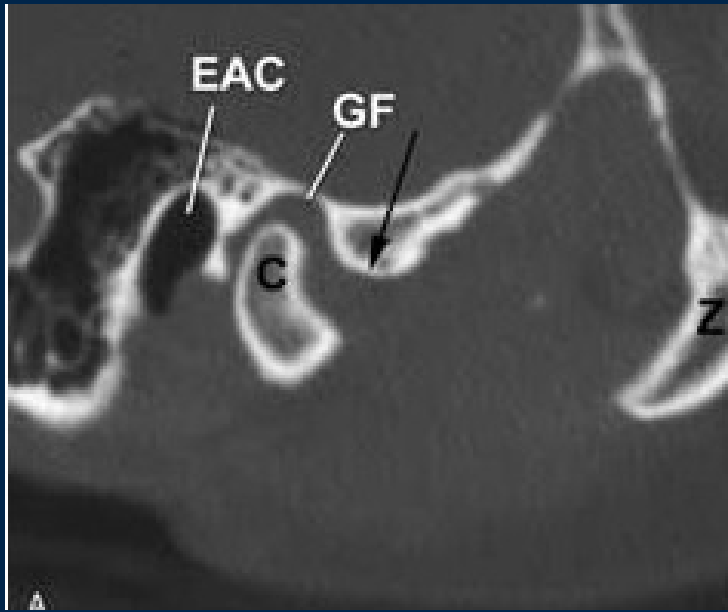
Specific radiography



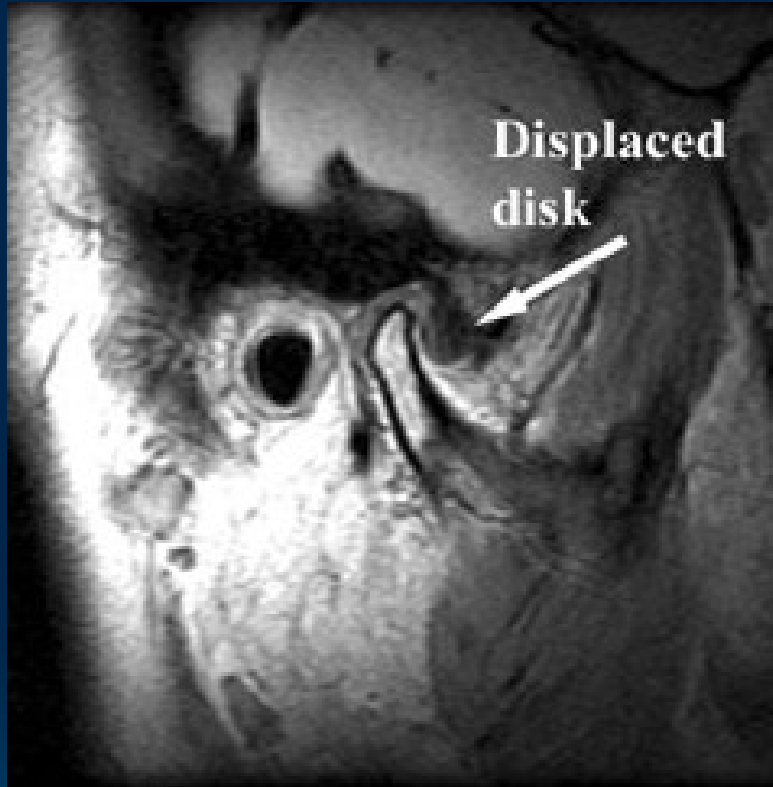
Conventional



Ortopantomograph

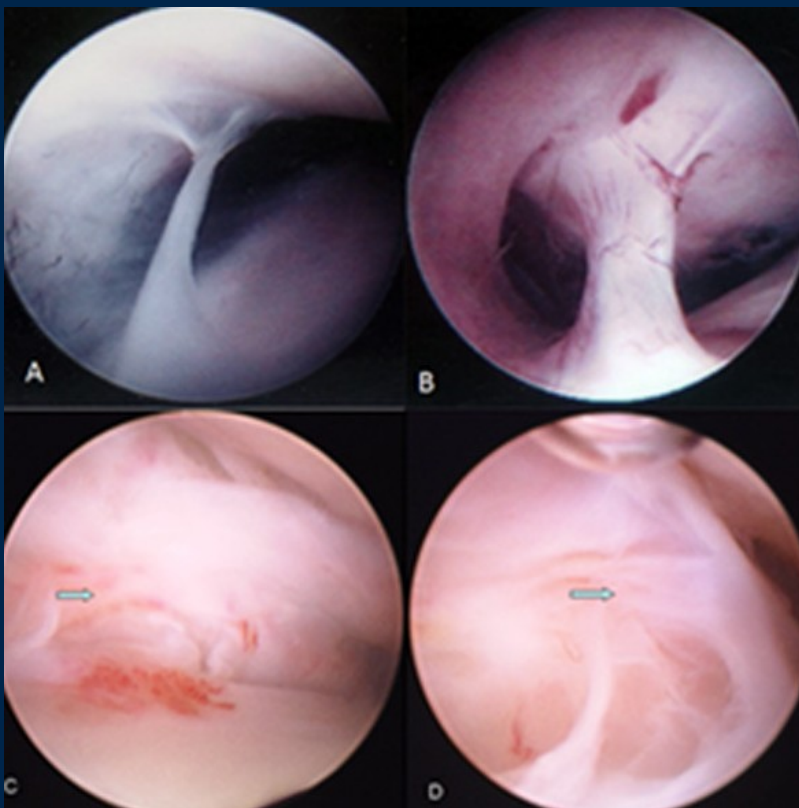


CT



MRI

Arthroscopy



Normally performed under general anaesthesia
Arthroscopy upper compartment or lower compartment

CAVE! injury to the auriculotemp. and facial nerve

9. TOPOGRAPHY RELATIONSHIP

Cranially

medial cranial fossa

Dorsally

external auditory

Laterally

glandula parotis
superficial temp. a.,v.
auriculotemporal n.

Medially

chorda tympani

