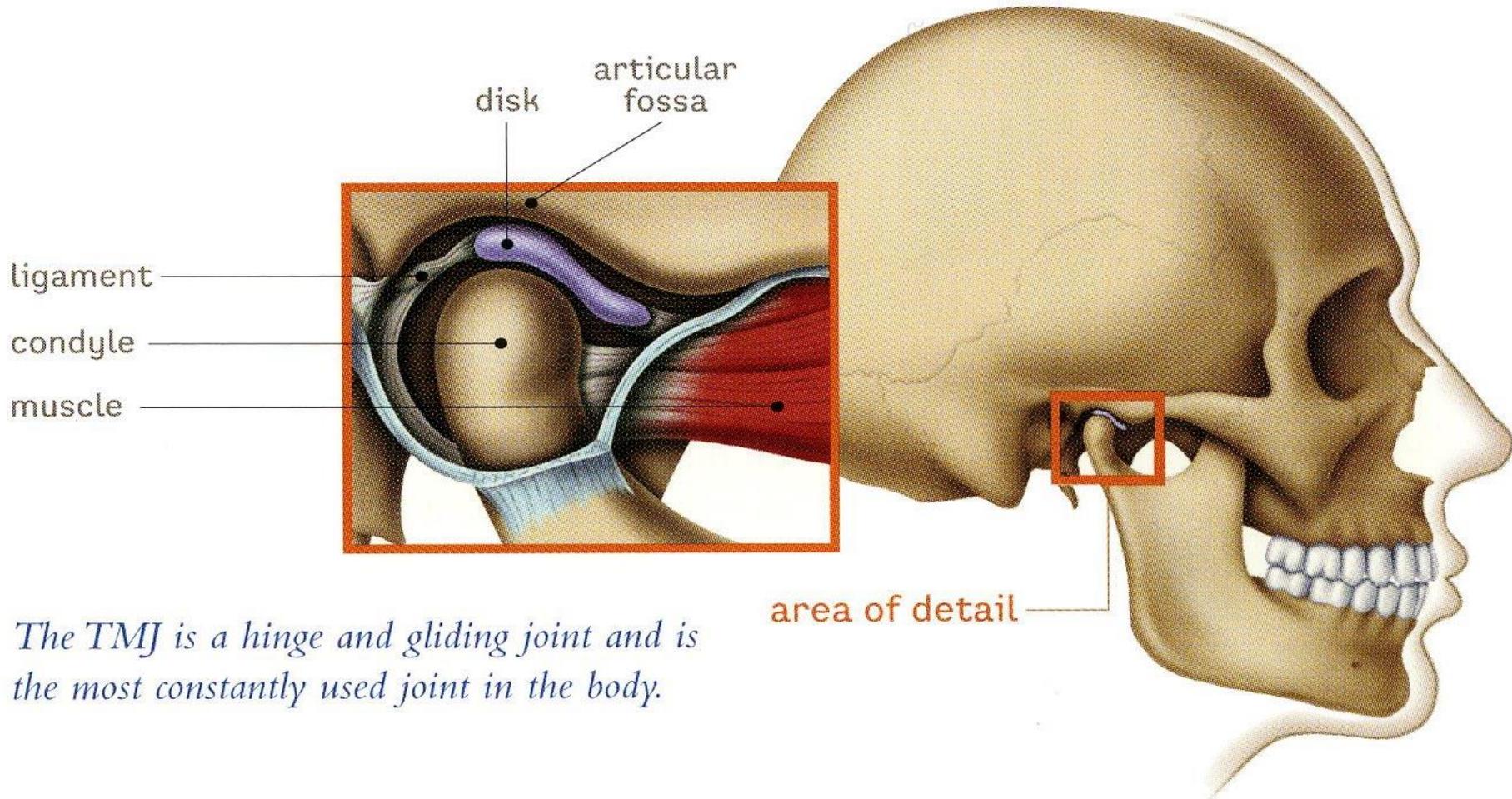


Mod 2 TMJ/TMD

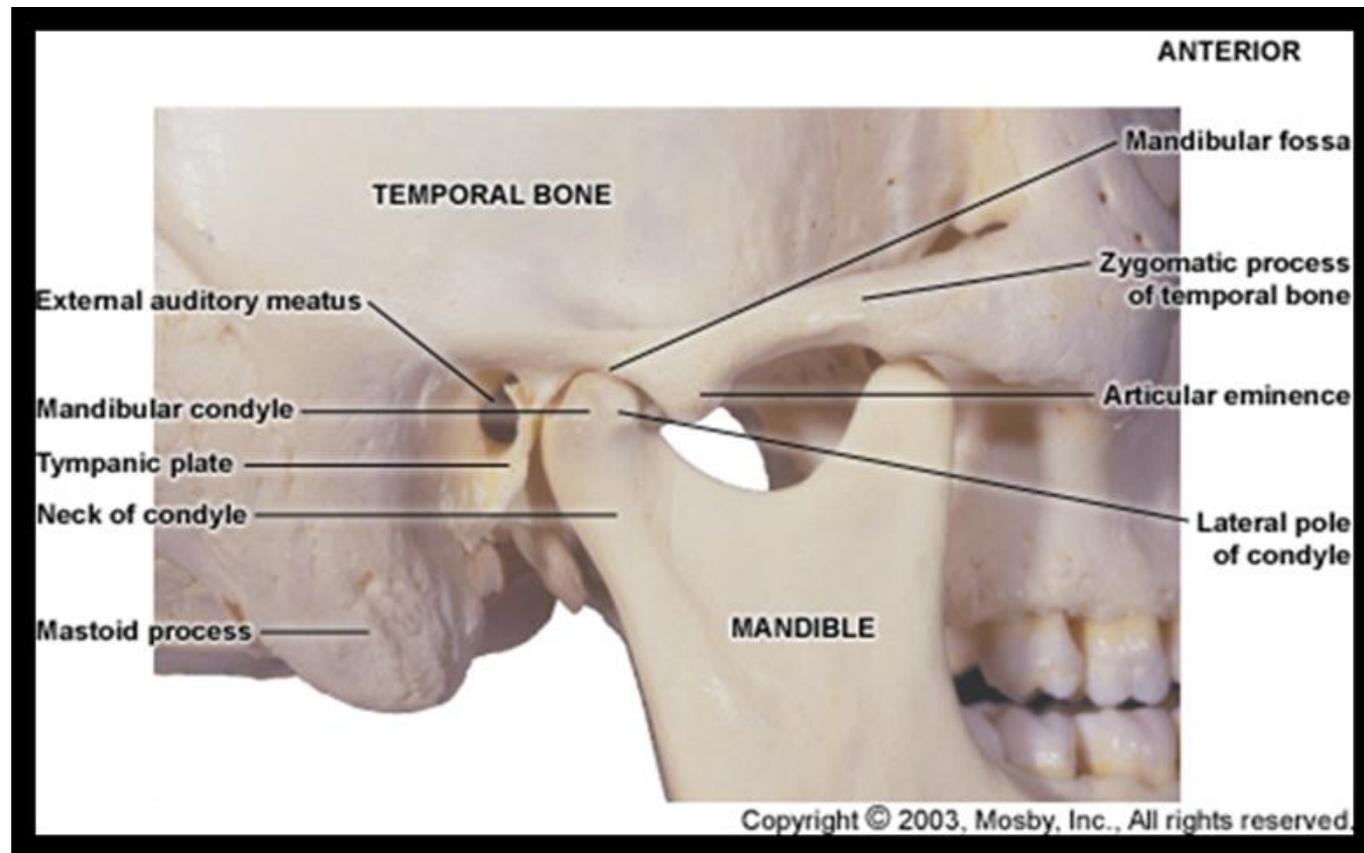


The TMJ is a hinge and gliding joint and is the most constantly used joint in the body.

The Temporomandibular joint is the joint of the jaw and is frequently referred to as the TMJ

The TMJs is the only synovial joints in the body with an articular disc

Name is derived from its location.



Introduction

- The most important functions of the temporomandibular joint (TMJ) are mastication and speech and are of great interest to dentists, orthodontists, clinicians, and radiologists.
- The TMJ is a ginglymoarthrodial joint, a term that is derived from ginglymus, meaning a hinge joint, allowing motion only backward and forward in one plane, and arthrodia, meaning a joint of which permits a gliding motion of the surfaces.



Peculiarity of TMJ

1. Bilateral diarthrosis – right & left function together
2. Articular surface covered by fibrocartilage
instead of hyaline cartilage
3. Only joint in human body to have a rigid endpoint of closure that of the teeth making occlusal contact.





VASCULARISATION

- The Blood supply to TMJ is only Superficial, i.e. there is no blood supply inside the capsule
- TMJ takes its nourishment from Synovial fluid



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.





Age changes of the TMJ:

- 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





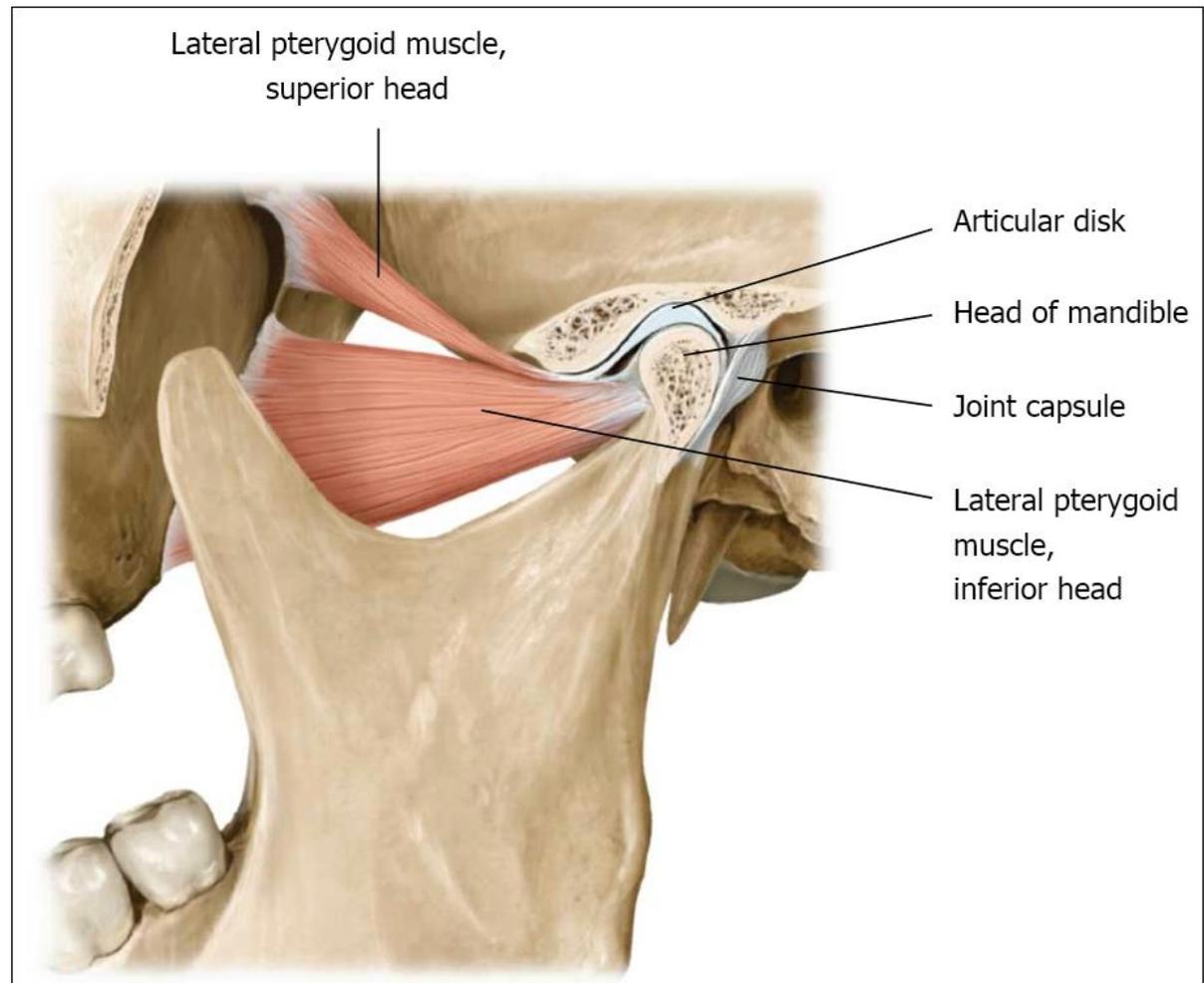
These age changes lead to:

- -Decrease in the synovial fluid formation
- -Impairment of motion due to decrease in the disc and capsule extensibility
- -Decrease the resilience during mastication due to chondroid changes into collagenous elements
- -Dysfunction in older people



There are 5 Main components that make up the TMJ

1. Articular surface of the Temporal bone
2. Capsule
3. Mandibular head/condyles
4. Articular disc
5. Lateral pterygoid Muscles
 - a. superior
 - b. inferior



Movements of synovial joint initiated & effected by muscle coordination.
Achieved in part through sensory innervation.

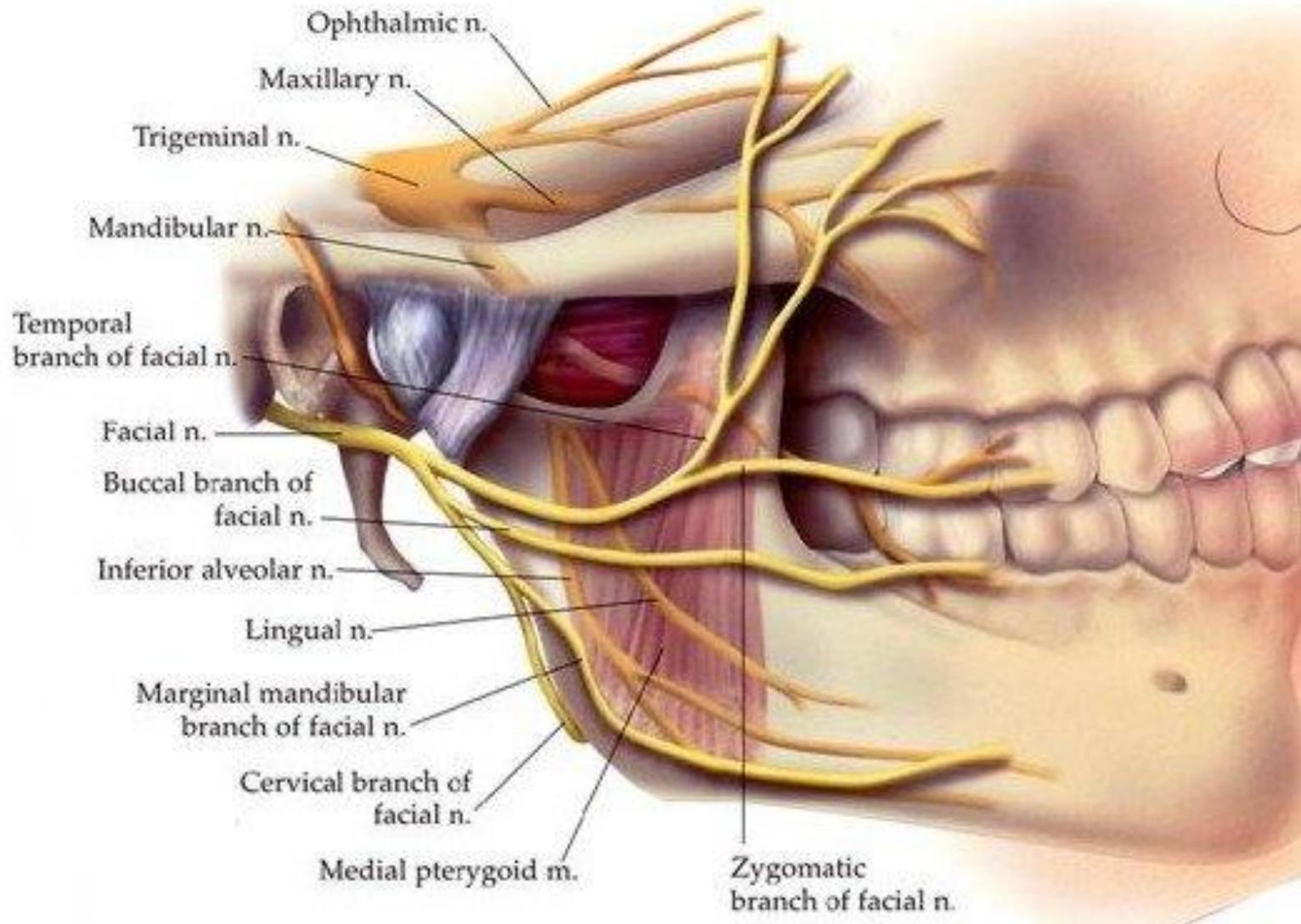
Hilton's Law:

The muscles acting on a joint have the same nerve supply as the joint.

Therefore:

Branches of the mandibular division of the fifth cranial nerve supply the TMJ (auriculotemporal, deep temporal, and masseteric)

Nerve supply of the TMJ



TMJ Dysfunction / TMD

- General orthopedic term implying a mechanical fault that interferes with the smooth action of the TMJ joint
- The most common internal derangement is disc displacement

Clinical Features

- Clicking sounds from joint(s)
- Restricted or normal mouth opening capacity
- Deviation on opening
- Pain

Complex and overlapping symptoms include:

- Frequent headaches, occurring when upon waking and may possibly re-develop in late afternoon
- Abnormal and/or painful jaw movements
- Ear pain
- Pain in or around eye area
- Cheek pain
- Mandibular pain

Detail of Symptoms:

Abnormal Jaw Movements & Pain

- ✦ “Locked” jaw (open or closed)
- ✦ Jaw deviates to affected side
- ✦ Problems finding stable bite position
 - Can’t find comfortable “closed” (bite) position
- ✦ TM Joint noise when opening or closing
 - “Cracking” or “popping”
- ✦ Overall limited jaw movement



✦ **Jaw deviates to affected side**



Tenderness to palpation

Pain in or in front of the ear is a common reason for a patient to seek treatment. A tenderness to palpation implies inflammation, generally as a result of acute or chronic trauma.

A finger should be placed in the immediate pre-auricular area, gently applying pressure on the lateral pole/head of the condial while the jaw is closed. The level of pain and discomfort on each side should be assessed and compared.



Ear Pain



- ✦ Mimic an earache
- ✦ Tinnitus (ringing in the ears)
- ✦ Hearing loss
- ✦ Itching in ear

Bruxism and Clenching



Bruxism: Teeth grinding as a habit can result in muscle spasm and inflammatory reactions, thus causing the initial pain. Changes in the normal stimuli or height of the teeth, misalignment of the teeth, and changes in the chewing muscles may cause temporomandibular joint changes. ***Generally, someone who has a habit of grinding his or her teeth will do so mostly during sleep. In some cases, the grinding may be so loud that it disturbs others.***

Clenching: Someone who clenches continually bites on things while awake. This might be chewing gum, a pen or pencil, or fingernails. The constant pounding on the joint causes the pain. ***Stress is often blamed for tension in the jaw, leading to a clenched jaw.***

Trauma

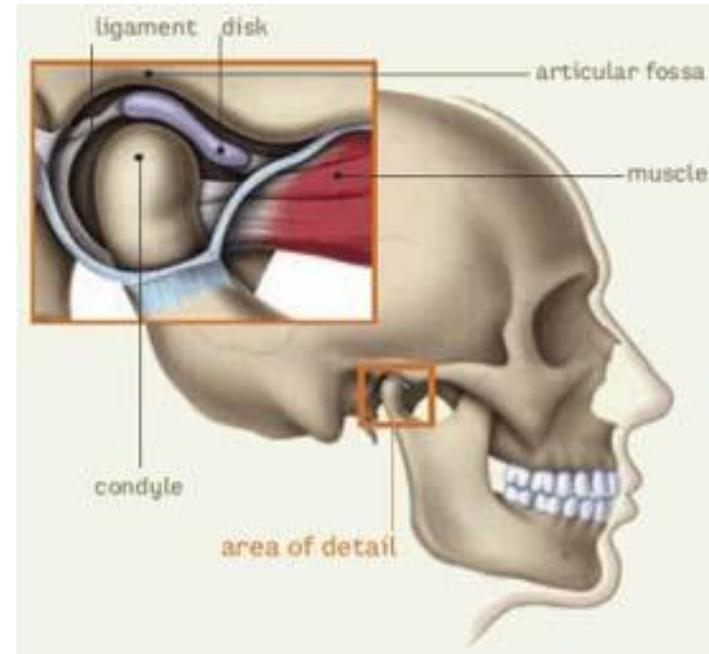
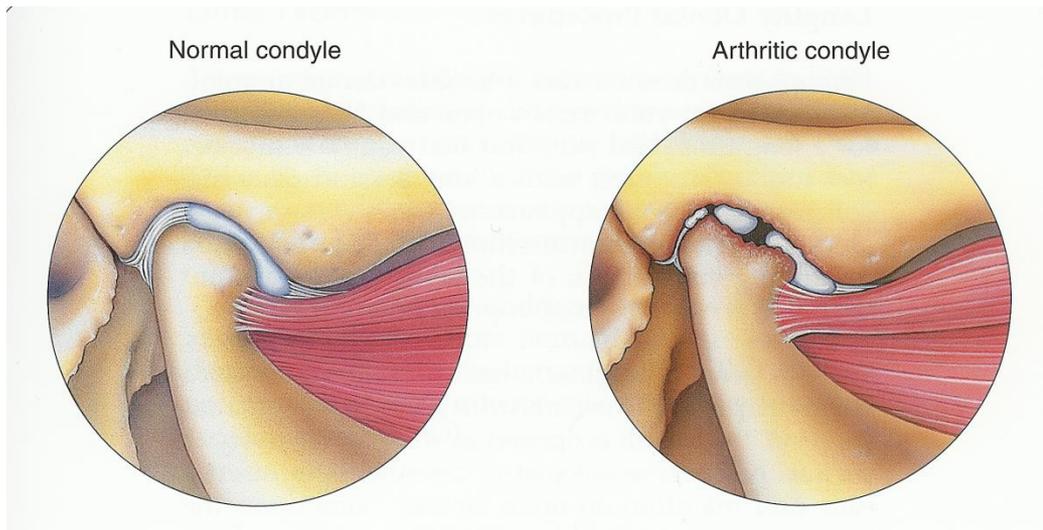


Trauma: Trauma is divided into microtrauma and macrotrauma.

Microtrauma is internal, such as grinding the teeth (bruxism) and clenching (jaw tightening).

Macrotrauma, such as a punch to the jaw or impact in an accident, can break the jawbone, cause dislocation of the TMJ, or damage the cartilage disc of the joint.

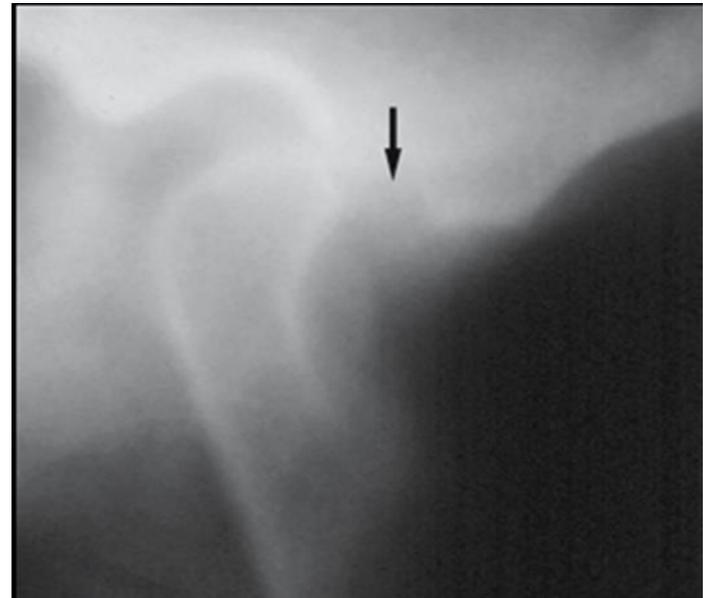
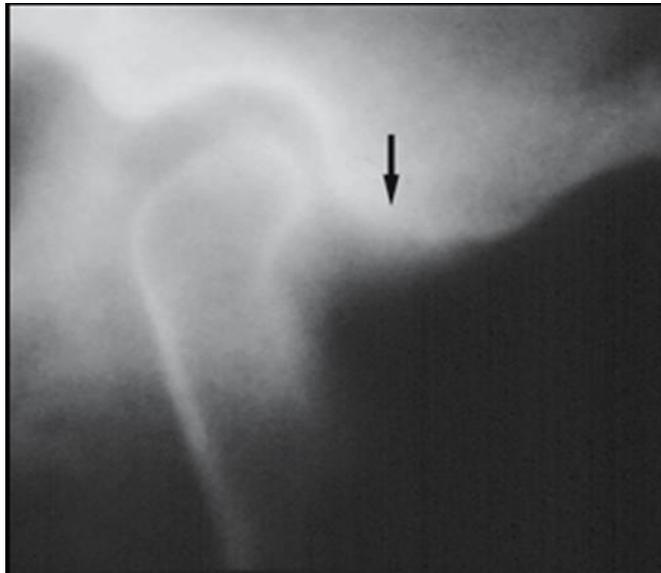
Pain in the TMJ can be brought on by dental work whereby the joint is stretched open for extended periods of time. *Massage and heat application after the dentist finishes can be helpful.*



Osteoarthritis: Like other joints in the body, the jaw joint is prone to undergo arthritic changes. These changes are sometimes caused by breakdown of the joint (degeneration) or normal aging.

Rheumatoid arthritis: Rheumatoid arthritis causes inflammation in joints and can affect the TMJ, especially in children. As it progresses, the disease can cause destruction of cartilage and erode bone, deforming joints.

Rheumatoid arthritis.

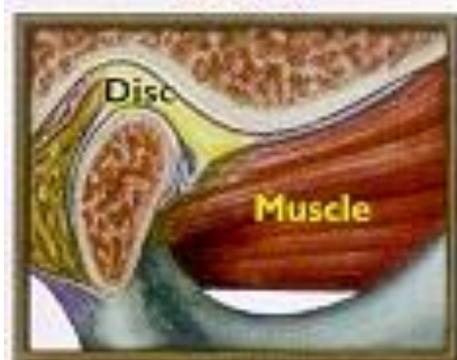


After 1 year

Questions you might want to be asking your clients

- What kind of pain do you have?
- Is it an ache, a throbbing pain, or a sharp stabbing pain?
- Is the pain continuous or intermittent?
- Can you outline the area of pain on your face with your finger?
- What helps to alleviate the pain? What aggravates the pain?
- Do you grind or clench your teeth? Do you bite your nails or chew on any objects, such as pens or pencils?
- Do you hold the telephone with your shoulder against your ear for a long time?
- Do you chew gum often? For how long?
- Do you have any oral habits that you have not mentioned?

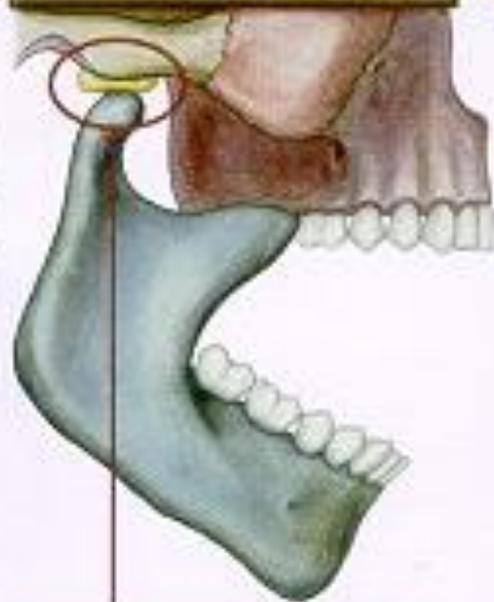
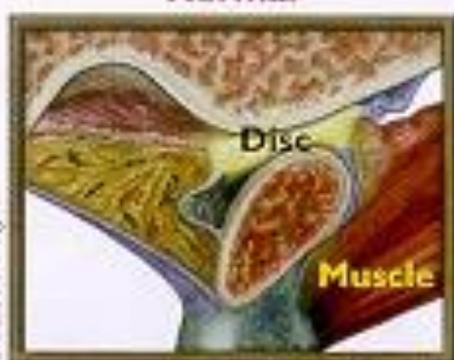
Normal



**Temporomandibular Joint
Normal Closed Position**

The structures that make it possible to open and close your mouth include the bones, joints, and muscles. When functioning correctly, your jawbone is separated from your skull by a soft disc that acts as a cushion when you chew, speak or swallow.

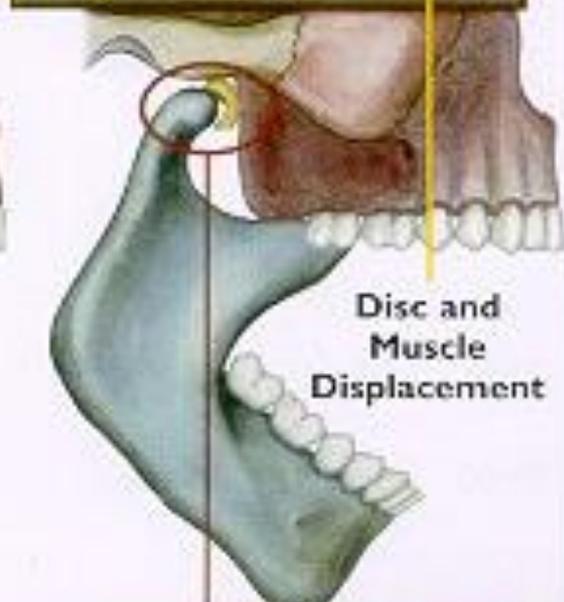
Normal



**Temporomandibular Joint
Normal Open Position**

When the joint is functioning properly, the disc stays in place when the jaw is in use, preventing the bony structures from coming in contact.

Abnormal

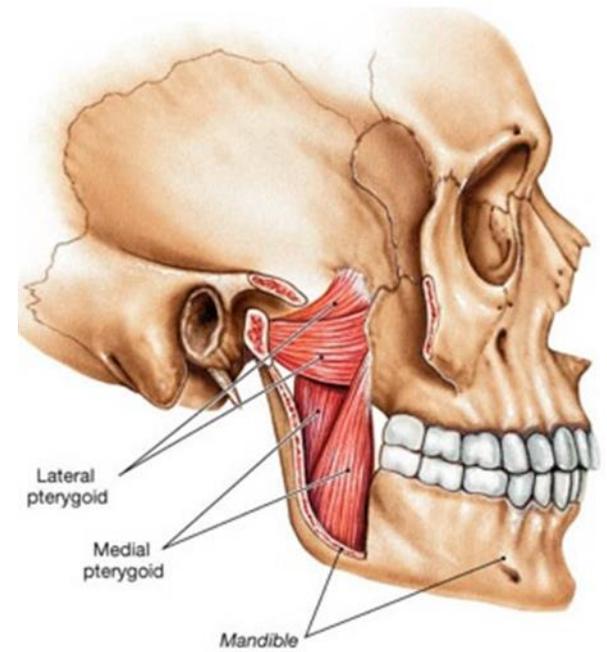


**Temporomandibular Joint
Dysfunctioning Open Position**

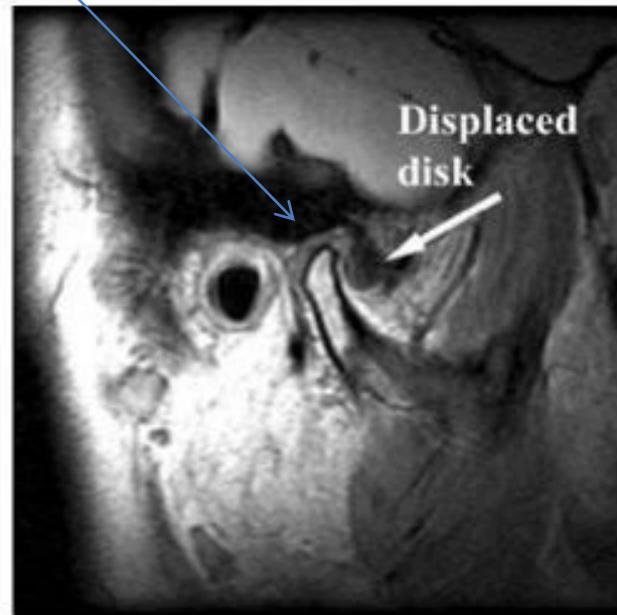
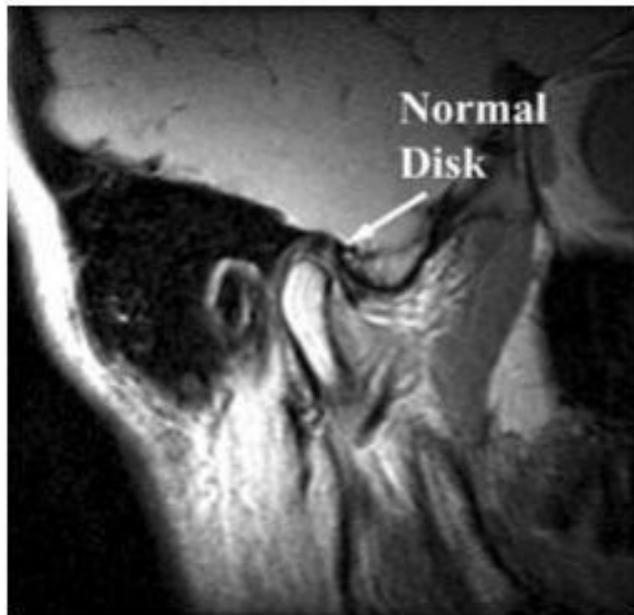
When the joint is not functioning properly, the disc is commonly pulled forward when the jaw is in use, causing the bones of the skull and jaw to grind together.

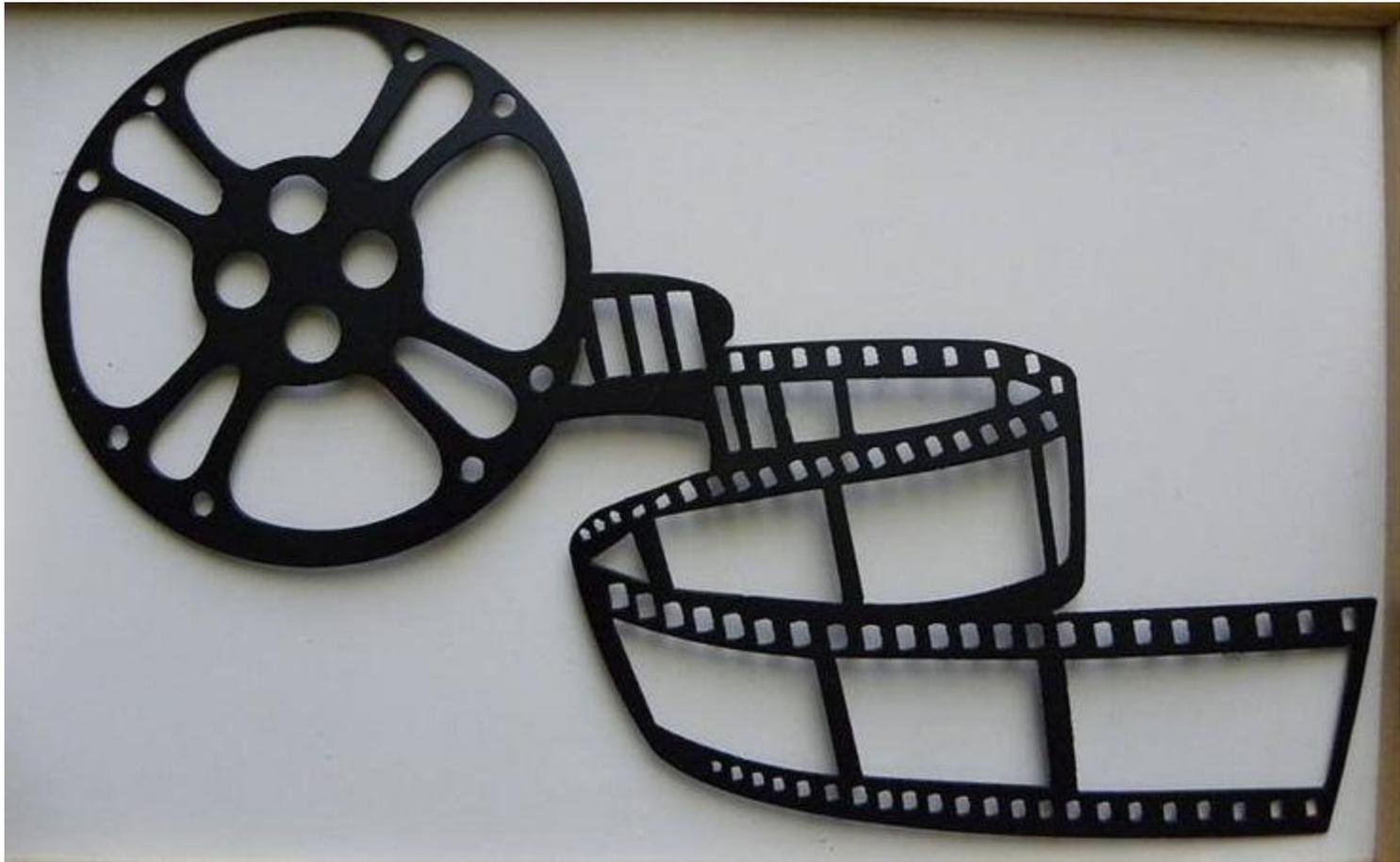
MRI of TMJ Disc

Retro Discal Tissue



(b) Lateral view, pterygoid muscles exposed

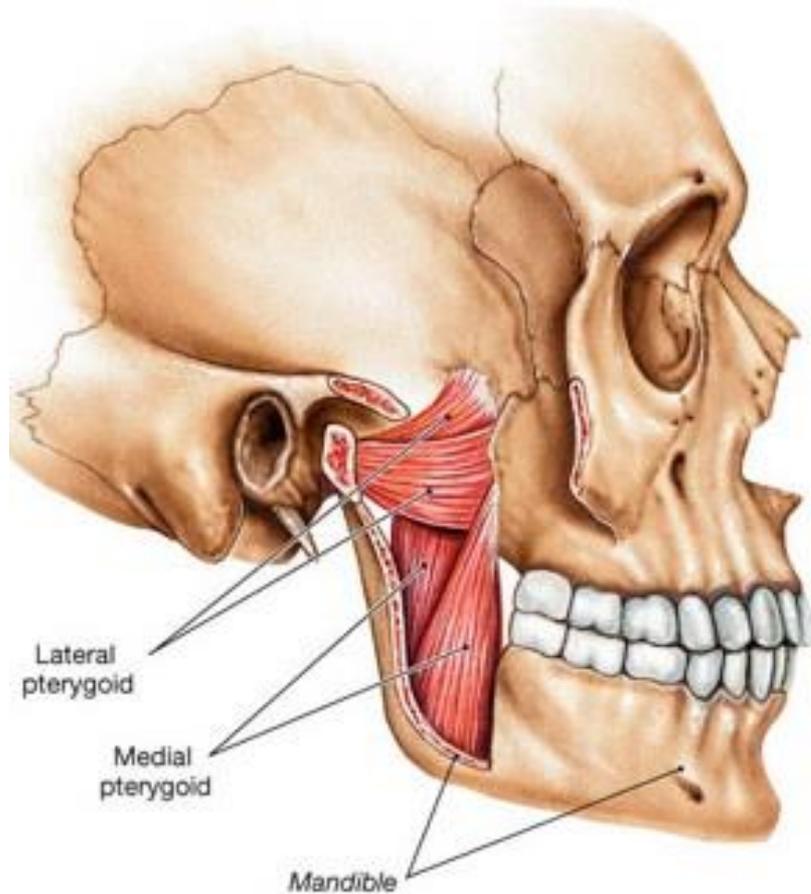




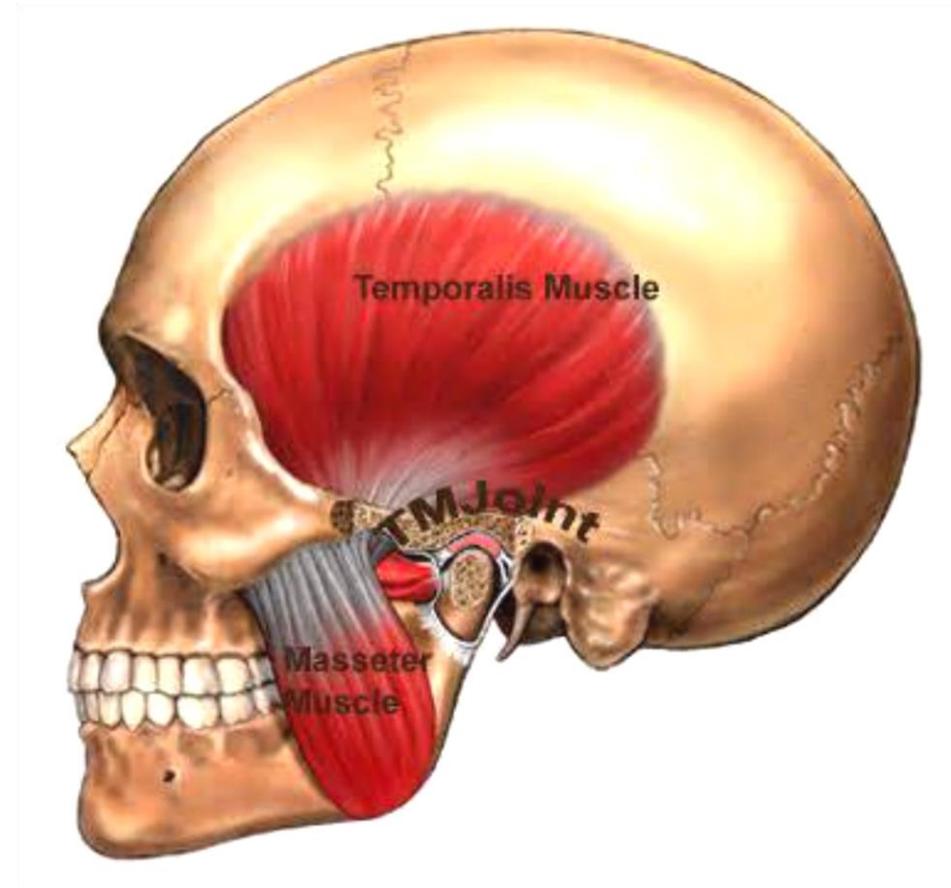
<https://www.youtube.com/watch?v=mB468Jh9aAY>

Main Muscles of Mastication

Pterygoids, Masseter, Temporalis

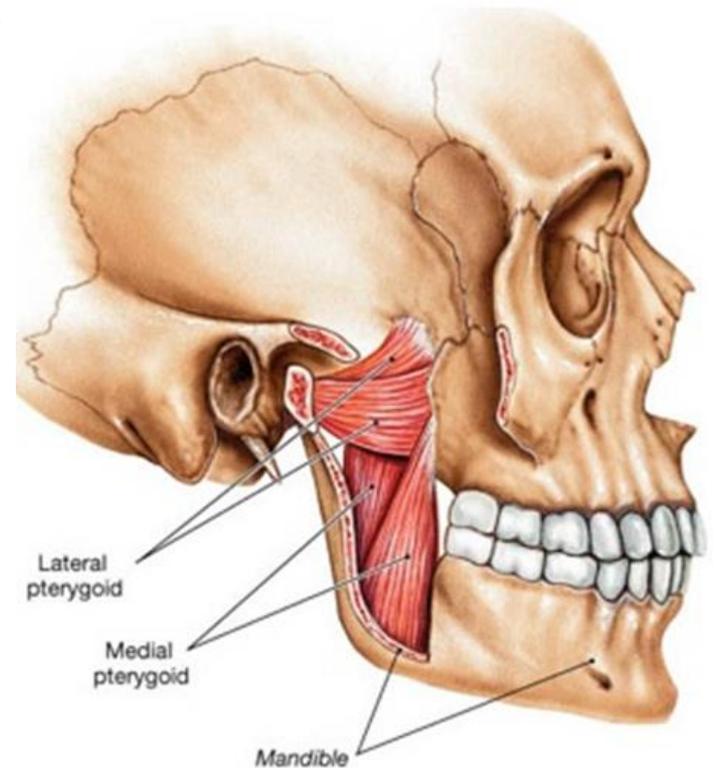


(b) Lateral view, pterygoid muscles exposed



The **lateral pterygoid** (or **external pterygoid**) is a muscle of mastication with two heads. It lies superiorly to the medial pterygoid.

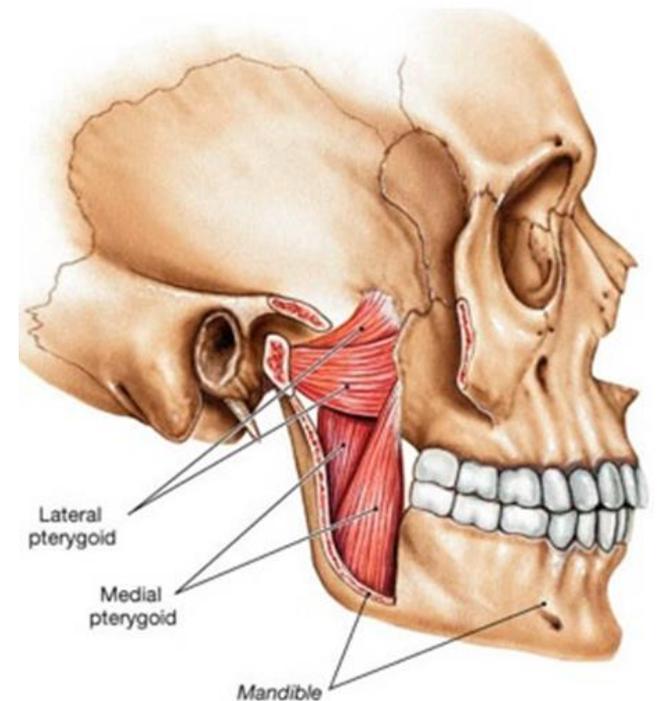
Unlike the other three muscles of mastication, **the lateral pterygoid is the only muscle of mastication that assists in depressing the mandible (opening the jaw).**



(b) Lateral view, pterygoid muscles exposed

The **medial pterygoid** (or **internal pterygoid muscle**), is a thick, quadrilateral muscle of [mastication](#).

- Elevation of the mandible (closes the jaw)
- Minor contribution to protrusion of the mandible
- Assistance in mastication
- Excursion of the mandible; (sideways) contralateral excursion occurs with unilateral contraction.



(b) Lateral view, pterygoid muscles exposed

Working the Medial Pterygoid

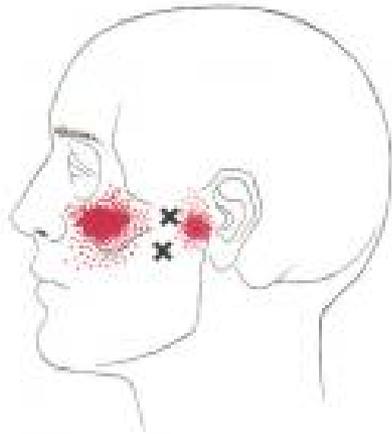
Inferior to Superior

Since this is internal regards to the Masseter we find it better to use pressure point release from inferior to superior to prevent the jaw from opening and lateral translating.

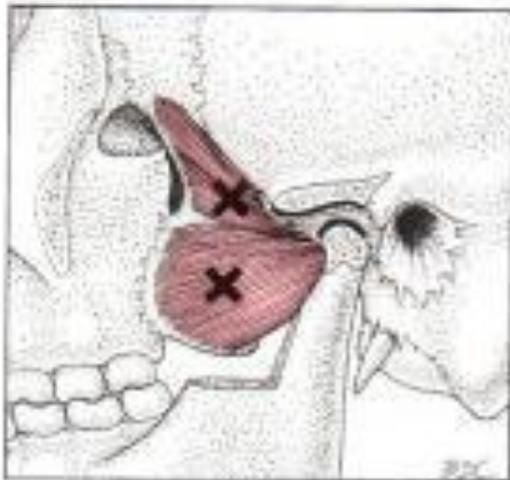
If TPs are present hold for at least 10-12 seconds before releasing to make sure referral patterns are not active in surrounding muscles.



Lateral Pterygoid TP pattern

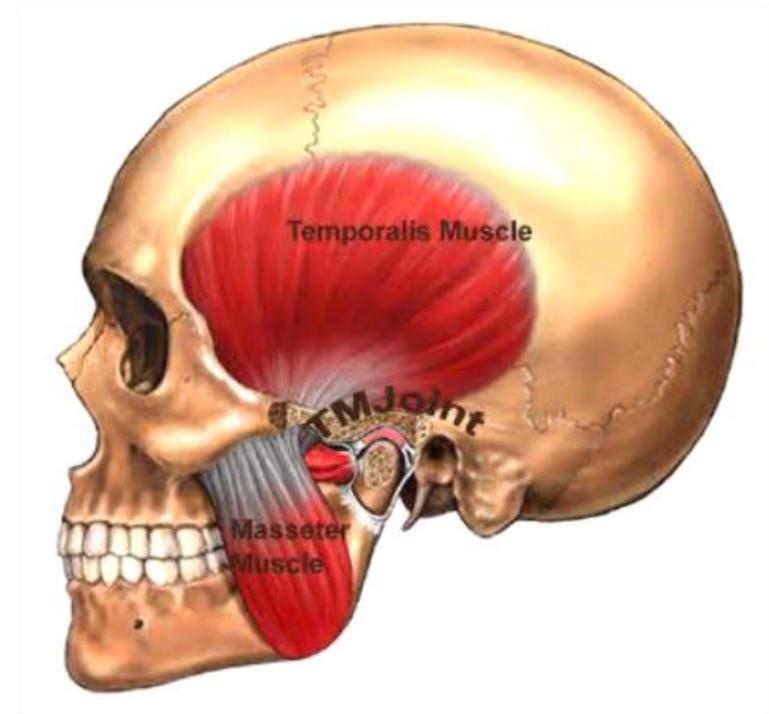


Medial Pterygoid TP pattern

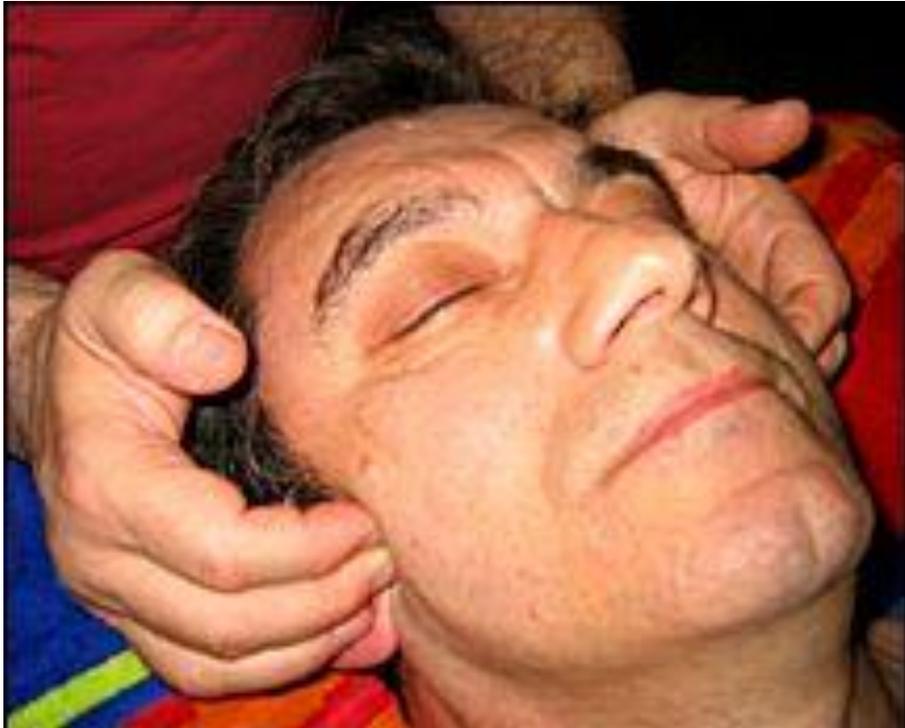


The **temporal muscle**, also known as the **temporalis**. It is a broad, fan-shaped muscle on each side of the head that fills the temporal fossa, superior to the zygomatic arch

If the entire muscle contracts, the main action is to elevate the mandible, raising the lower jaw. Elevation of the mandible occurs during the closing of the jaws. If only the posterior part contracts, the muscle moves the lower jaw backward. Moving the lower jaw backward causes retraction of the mandible. Retraction of the jaw often accompanies the closing of the jaws

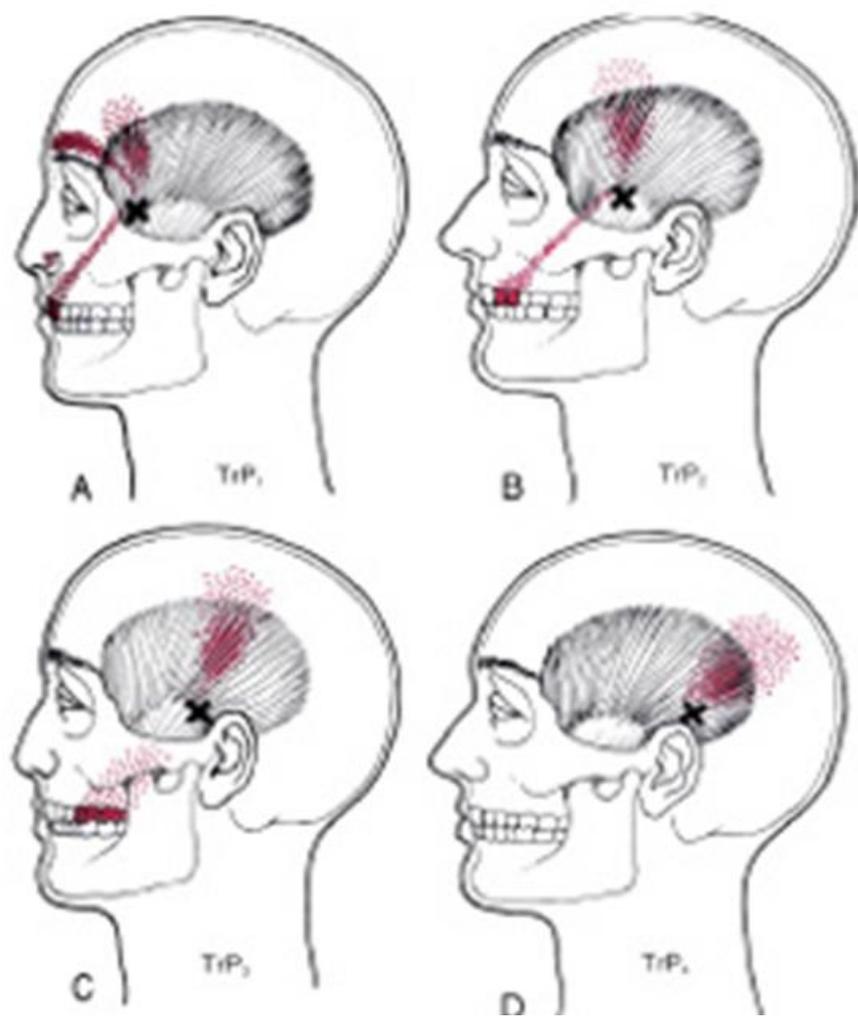


Temporal muscle



Temporalis

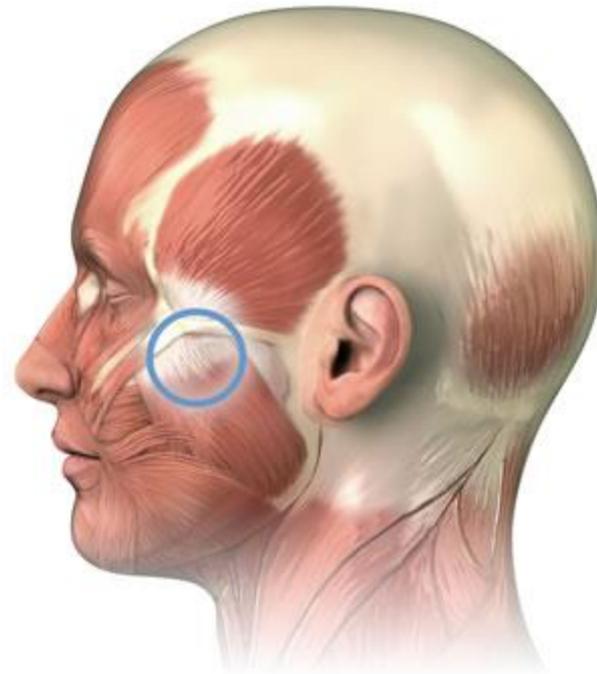
Trigger points A, B, and C occur at the attachment of muscle to tendon and refer pain to the upper teeth and are most often associated with 'temporal tension type' headaches, and maxillary tooth pain. Temporalis trigger points are very common in TMD and Facial Pain patients.



The Masseter muscle

| Pain Location | Problems | Related Muscles |
|---|--|-----------------|
| in the side of the face, jaw, teeth (rarely) | bruxism, headache, jaw clenching, TMJ syndrome, toothache, tinnitus | masseter |

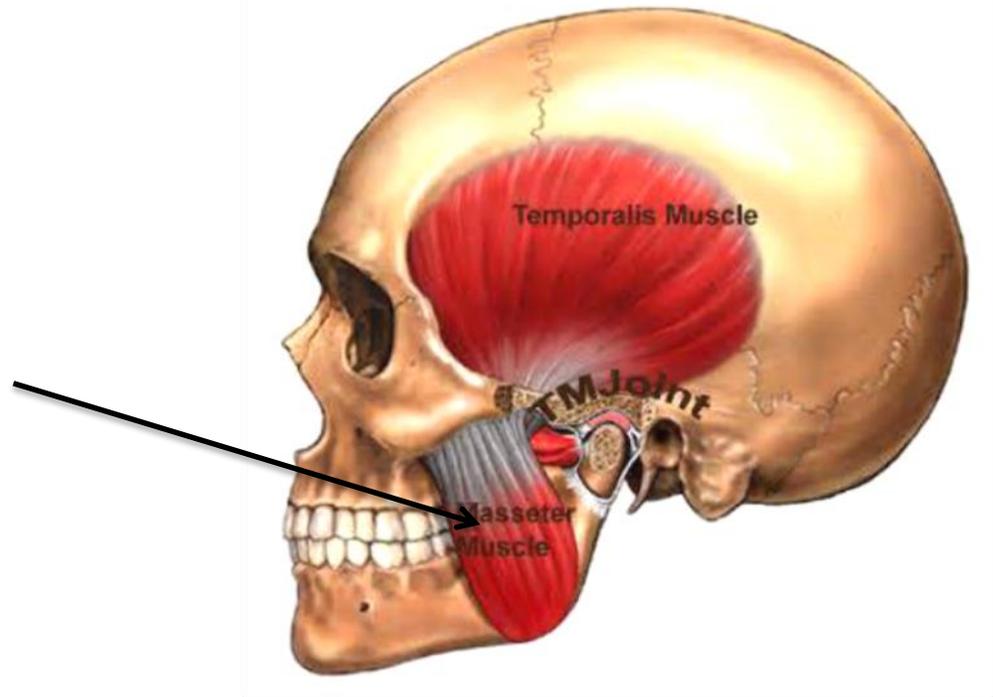
It is an accomplice in many cases of bruxism (that's Latin for "grinding your teeth") and temporomandibular joint syndrome (a painful condition of the jaw joint), and probably other unexplained painful problems in the area — it will be either a contributing factor or a complication.



In human anatomy, the **masseter** is one of the [muscles of mastication](#). In the animal kingdom, it is particularly powerful in [herbivores](#) to facilitate chewing of plant matter. The most obvious muscle of mastication is the masseter muscle, since it is the most superficial and one of the strongest.

The action of the muscle during bilateral contraction of the entire muscle is to elevate the mandible, raising the lower jaw. Elevation of the mandible occurs during the closing of the jaws. The masseter parallels the [medial pterygoid muscle](#), but it is stronger.

Masseter



The Masseter muscle

Superior to Inferior/Posterior

Fascial stripping sup to inf

Cross frictional (light)

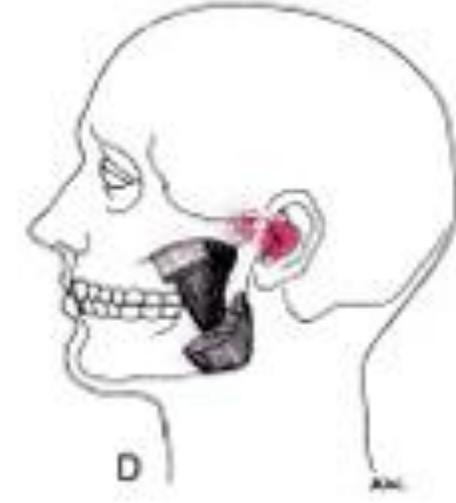
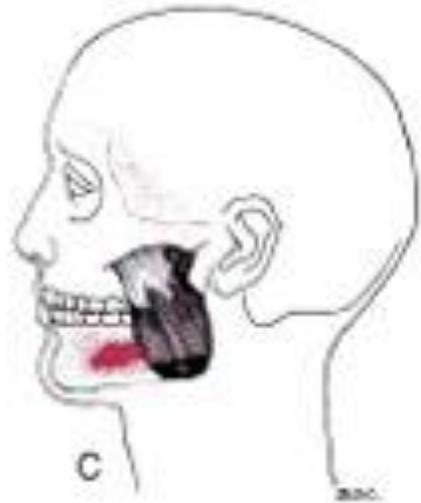
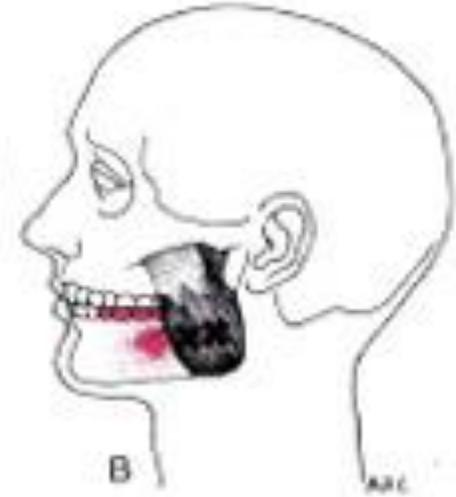
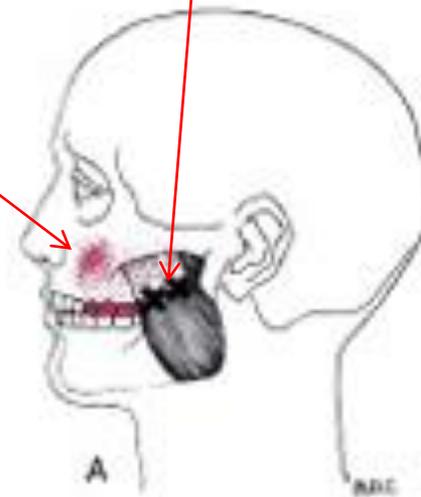


Masseter

Primary

Referred

Note that trigger points from the Masseter muscle often refers pain to the upper jaw sinus area and top and bottom molar teeth. An incorrect diagnosis of sinusitis or molar tooth pain is often made. Pain is also referred to the ear and TMJ.





Cervical Curve

Changes to the Cervical Lordosis can cause TMJ issues.

1. Abnormal strain on the supporting muscles
2. Disc Degeneration
3. Lateral translation of cervical
4. Anterior Head Displacement

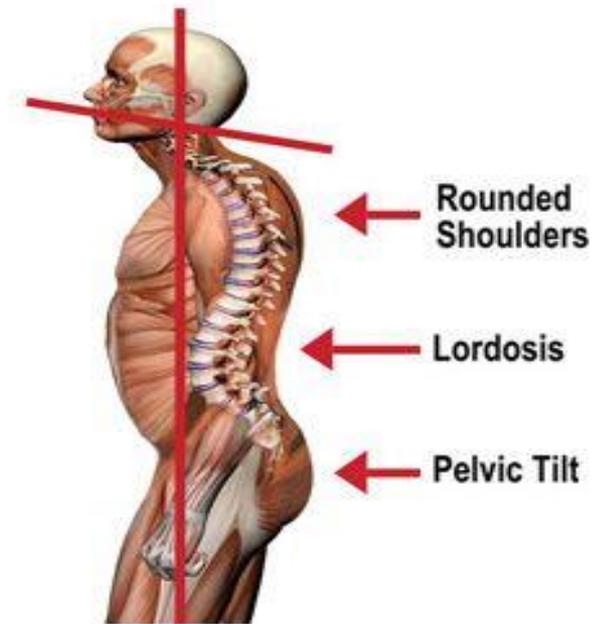
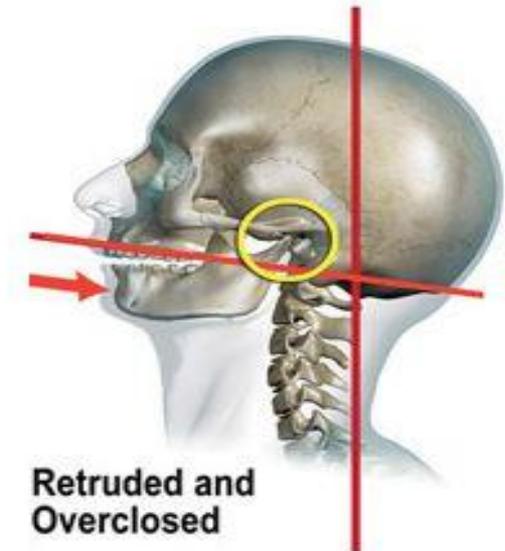


Fig. 1

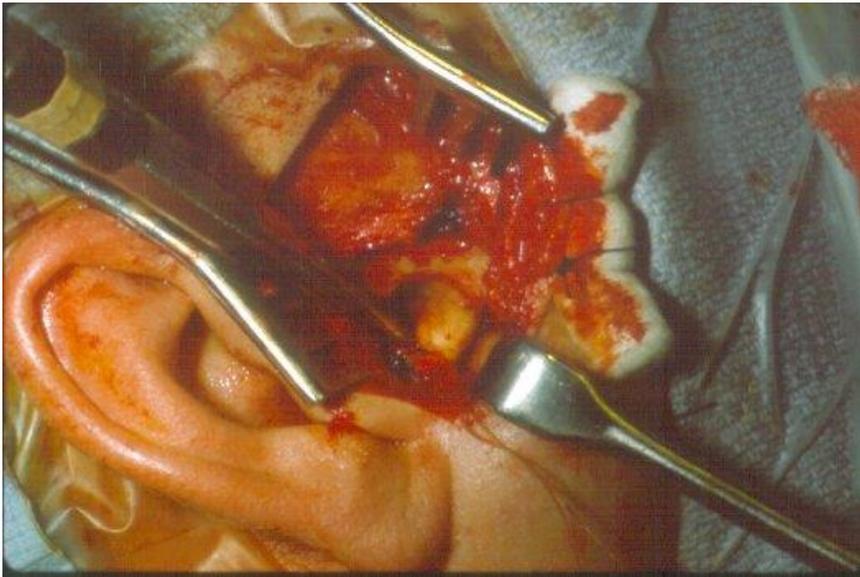
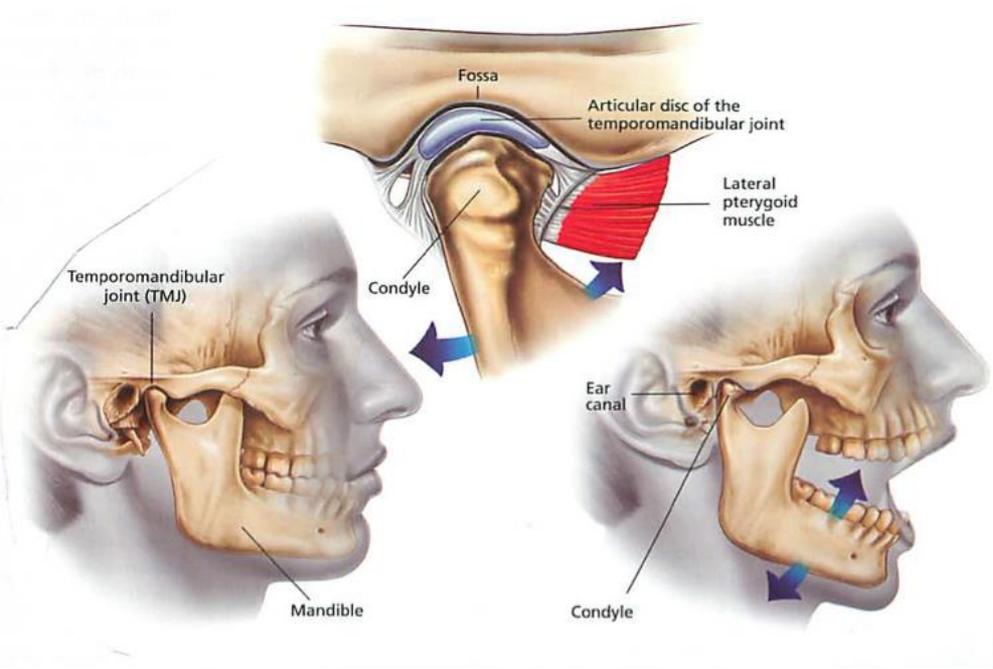
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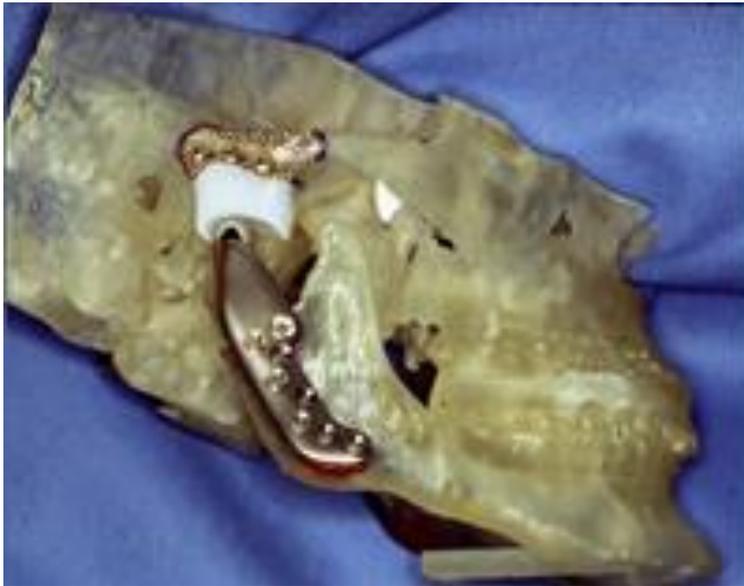
Surgery

Caution weak stomachs be warned





TMJ Implants



4 main Types of Surgical procedures

Arthrocentesis

This procedure consists of **irrigating the jaw joint** and is the least invasive TMJ surgery. It is performed in a few minutes while you are under general anesthesia. You may feel nauseous from the anesthesia when you first wake up, and you will probably experience some swelling. **If your jaw pain goes away after arthrocentesis, the surgery was a success. If the pain does not subside, more invasive procedures are probably necessary.**

Disk Repositioning

Disk repositioning surgery will require you to stay overnight in the hospital. The surgery itself takes two hours or more under general anesthesia. You will probably experience nausea, swelling and pain at the surgical site, which should pass in a few days. **The disk is sewn back into its proper place and muscles and ligaments are repaired as needed. Sometimes the disk will slip out of place again, requiring more extensive surgery at a later date.**

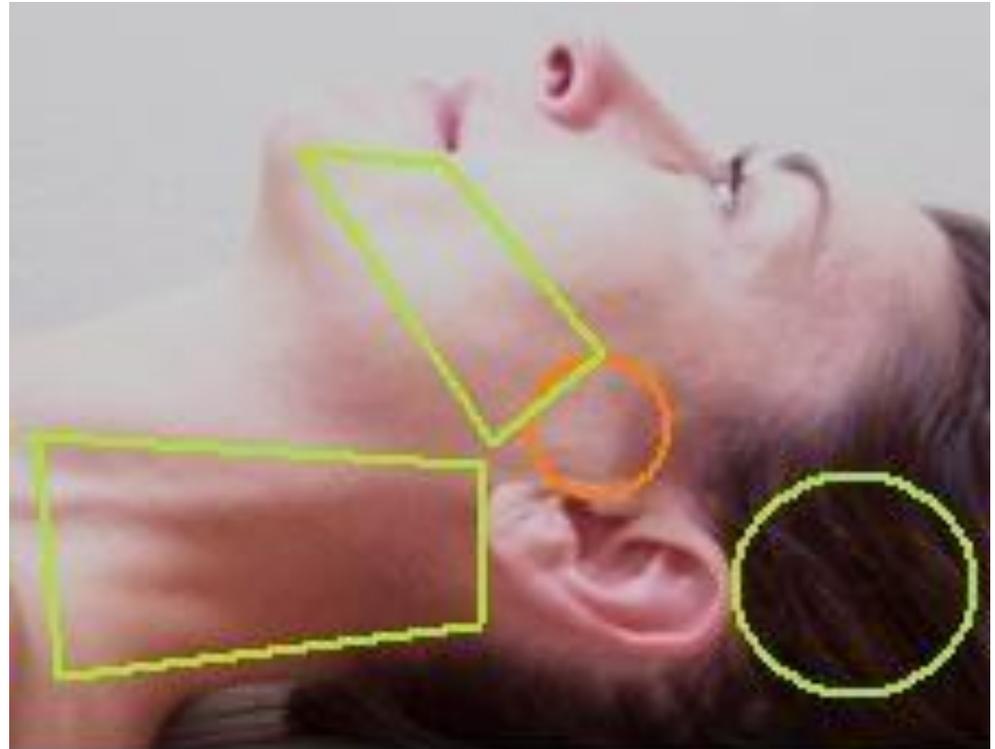
Discectomy

A discectomy, **or removal of the disk that cushions the joint**, requires you to stay overnight in the hospital and is performed in a few hours under general anesthesia. Since this is a more radical procedure, recovery time can last two to three weeks. It may take several months for tissue to fill the joint again, and in the meantime your bones will rub and grind together. **You should experience significant reduction in pain and be able to use your jaw within a month or six weeks following surgery.**

Articular Eminance Recontouring and TMJ Replacement Surgery

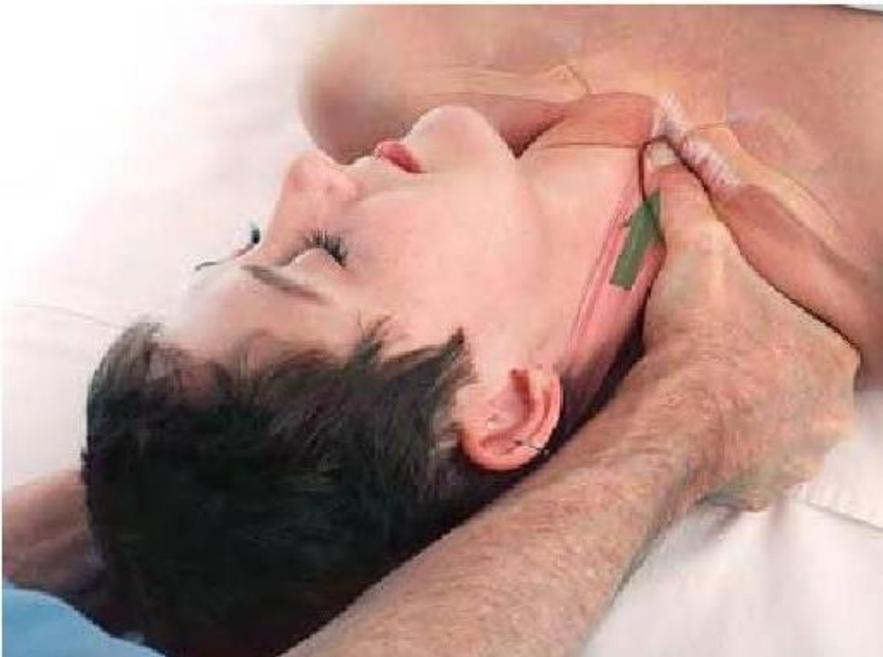
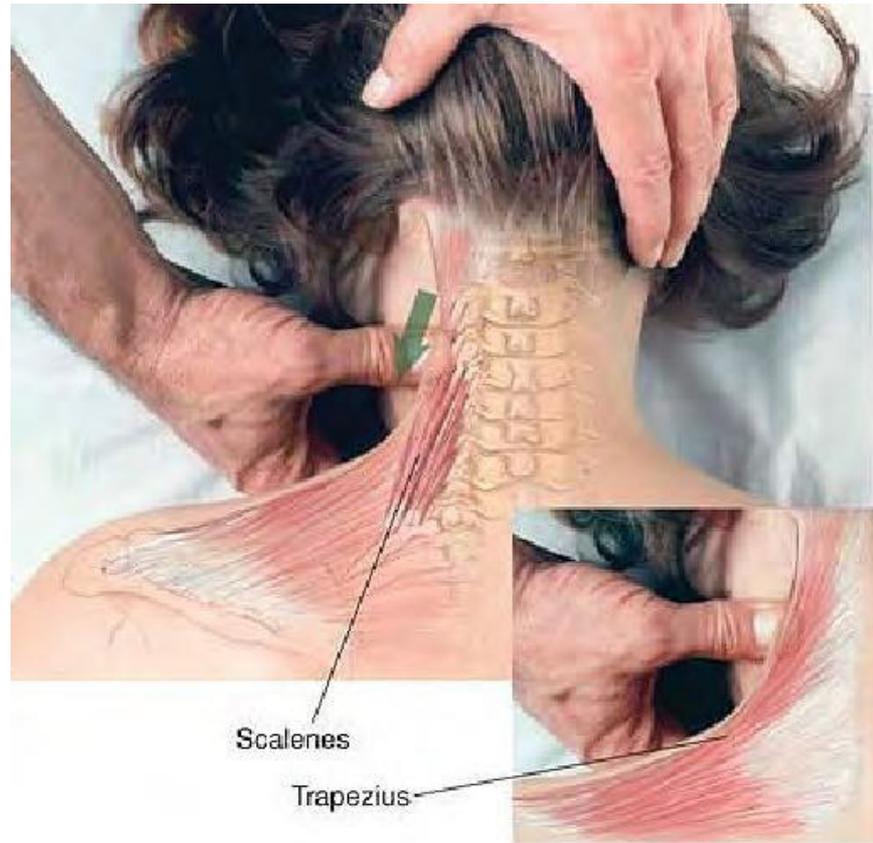
Articular eminance recontouring, or the reshaping of the ball in the joint, is usually performed in the hospital as part of a more invasive TMJ surgery such as TMJ replacement. In TMJ replacement surgery, diseased parts of the jaw joint are removed and replaced with prosthetic parts (either bone harvested from another part of the patient's body or a metal joint). Since this is major surgery, your recovery time will be long and you may need to adjust your lifestyle to accommodate the replacement parts. You should regain use of your jaw in about a month, but will no longer be able to eat hard foods that could damage the new joint. This operation is a last resort, but it could become necessary if all other options have been explored.

Practitioner must perform manual release on muscles contributing to the TMJs

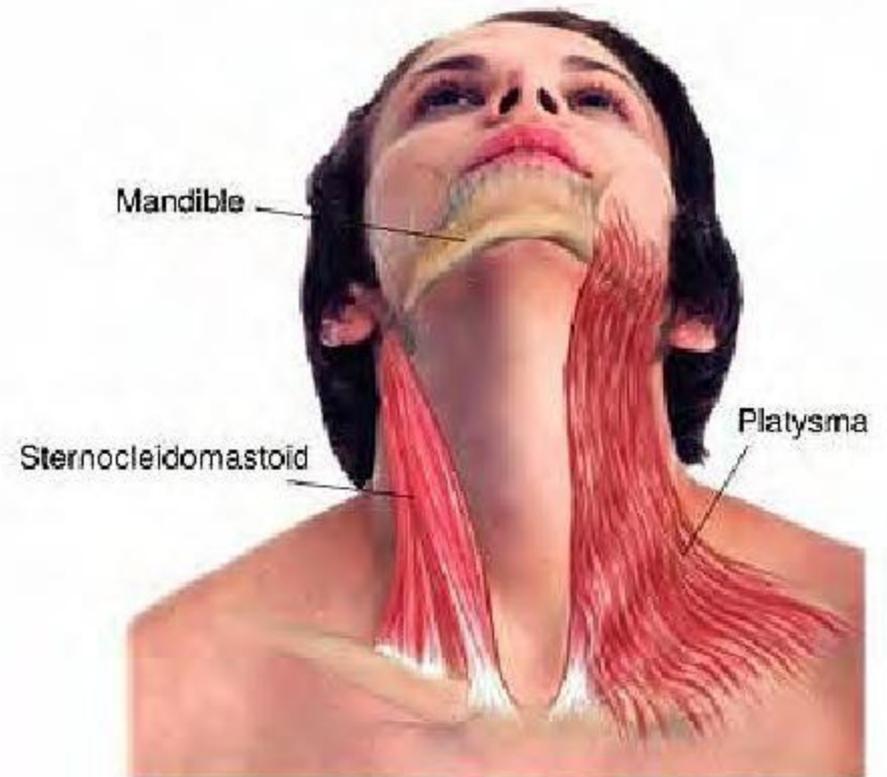


TMJ (Temporomandibular Joint) location in orange. Muscles which have an effect (pull on/create pressure) on that joint are marked in green. There are also muscles inside the mouth which affect the TMJ.

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Superficial Neck Muscles



We will not discuss the critically important issue of intra-oral treatment of the TMJ dysfunction in this webinar. Unfortunately, from the legal point of view, the manual treatment in body cavities is outside the scope of the massage profession, even if the practitioners have proper training.



Final Slide