Cons sheet Dr.Suzan Eman Al.Hamad

\*\*This sheet is a copy of last year’s sheet. There are many additions and corrections and some links to watch.

I**n this lecture, we are going to talk about temperomandibular disorders(TMDs) and their classifications. This is a very hard and complicated topic for undergrad students but we are supposed to understand the general classification of TMDs in this lecture and later we’re going to discuss the clinical examination of each disorder.**

**\*Classification of TMDs.**

**\*Examination of TMDs.**

**\*Etiology of TMDs.**

**\*Management of TMDs.**

**The classification of TMDs is referred to a scientist called Aucisson who established it in 1996.**

-Epidemiological data shows:

- that 50-75% of the population have ***signs*** of TMDs.

-20-25% have ***symptoms*** of TMDs.

-only 3-4% of the population ***seek treatment*** for TMDs. (small minority, that’s why you underestimate TMDs).

- age range: 15-30 years-old ptns >> have ***dysfunctional symptoms*** (like clicking, muscle tenderness etc.) so usually dysfunctional symptoms associated with young age groups.

-Ptns who are older than 40 years have more commonly ***degenerative joint disease*** (like osteoarithritis, osteoarithrosis etc.)

-Internal derangement can occur at any age. It is a problem between the condyle, disc, and glenoid fossa.

-Prevalence: male: female = 1:1 no predilection but more females are seeking treatment compared to males with 5:1 ratio.

**TMDs are multifactorial conditions that have no single etiological factor. It could be due to trauma, stress, genetics, parafunctional habits, deep pain inputs, and occlusion (not really a significant factor).**

**Events that extend beyond the physiologic tolerance of the ptn (like prolonged mouth opening, stress, local anesthetic injection etc.) will lead to TMDs at the end.**

* **Occlusion is a variable factor across all ptns. This means that there is no certain type of malocclusion such as class II or class III related or attributable to a certain type of TMD.**
* **Pain is the most common cause for the ptn to seek treatment.**
* **50 % pf ptns reported to have parafunctional habits.**
* **Muscle tenderness is frequently detected but rarely reported, that means when you are examining the ptn, he might feel some sort of tenderness, but when you ask him about history of pain, no pain experience would be recorded.**
* **Plane Radiography is the last tool used to diagnose TMDs because it can’t show us soft tissues. Also, it’s a 2D image (not 3D) which can’t reveal the disease except when it is in an advanced stage. (it only gives you information when there is a big problem in bone).**
* ***Joint noises:***
1. **Clicking: happens with internal derangement (it’s a popping sound associated with displacement or dislocation meaning that the condyle and the disc are not going together).**
2. **Crepitus: happens when there is a problem with the articular surfaces خشخشة due to a degenerative disease.**
3. **Locking: is occasionally reported.**
4. **Trismus: the ptn usually complains of pain in his muscles and limitation of jaw movements particularly when he wakes up at morning, this is a strong sign of parafunctional habits like sleep bruxisim at night. Also, there is another type of diurnal bruxisim at day time.**

 **Aucisson 1996 TMDS Classification**

1. **Masticatory muscles disorders.**

\*Protective muscle cocontraction

\*muscles soreness

\*myofacial pain

\*myospasm

\*CNS mediated myalgia

\*fibromyalga

1. **Temperomandibular joint disorders.**

\*derangement of the condyler disc complex

\*structural incompatablity of the articular surfaces

\*inflammation

1. **Mandibular hypomobility.**\*bone (sort of ankylosis whether fibrous or bone, or a coronoid impedance).
\*Muscular problem (Muscle contracture).
2. **Growth disorders.**

\*\* You will find other classifications. But this is a stepwise one and basic.

**…………………………………………………………………………………………………………………………………………………………………..**

**The first group we will discuss is masticatory muscles disorders and its categories**

* **Protective cocontraction (muscle splinting): It is the body’s response to any injury, by which the activity of appropriate muscle is to protect the injured part and the muscles are maintained in a mildly contracted state called tonus.**

**-Ex: If you have injured your leg in a specific muscle, you notice that there was pain and contraction in other near muscles “coconraction protective response” this will allow you to walk in a different way تعرج to reduce the feeling of pain.**

**-agonist and antagonist muscles work together (splinting) as a first response to injurious event.**

**-if not resolved it will continue to the second category which is muscle soreness.**

**-Causes: 1. Altered sensory or proprioceptive input.**

 **2. constant deep pain input.**

 **3. emotional stress.

-The key to know it is that the event has been recent immediately follows an event. For example, if you give your pt. an ID block then he started to complain of pain in muscles which are not related to the area you gave the anesthesia to, then it’s protective cocontraction due to the deep pain.**

**- Clinically : 1. Mild structural dysfunction ( reduced range and velocity of movements ) that means when you ask your ptn to open his mouth quickly , you will notice that he will open but with a slow velocity and not fully.**

 **2. no pain at rest**

 **3. increased pain with function**

 **4. feeling of muscle weakness**

**-If muscle cocontraction didn’t resolve since it usually appears and subsides fast, then it will continue as muscle soreness.**

* **Muscle soreness: it’s the first response after a prolonged /protracted muscle cocontraction .**

**Causes: 1. protracted muscle cocontraction**

 **2. trauma**

 **3. emotional stress**

 **4. local enjury**

**Clinically:**

**When you hear the history of your ptn he will say that Pain began several hours to few days following the event (like prolonged mouth opening).Whereas, in muscle cocontraction pain with function is reported directly/immediately after the event .**

1. **Structural derangement**
2. **Minimum pain at rest**
3. **Increased pain with function**
4. **muscle weakness**
5. **Local muscle tenderness**
* **Myofacial pain (trigger point myalgia): it’s a regional myogenous pain characterized by local areas of firm hypersensitive bands of muscle tissue known as trigger points and is both centrally and peripherally mediated.**

**Causes: 1. Protracted local muscle soreness**

 **2. deep pain**

 **3. increased stress**

 **4. sleep disturbances**

 **5. local factors: habits, improper postures, strain, ….**

 **6. systemic factors: hypovitaminosis, fatigue, viral infection.**

**\*ex. when we palpate sternoclidomastoide, the ptn feels pain in the molars area or in TMJ (heterotopic pain).**

**History: misleading history. (The pt comes to you complaining of tension headache and it’s due to trigger point in a muscle)**

**Clinically: 1. Structural dysfunction**

 **2. pain at rest**

 **3. increased pain with function**

 **4. presence of trigger point

-Patient may be aware of the referred pain and may not acknowledge the trigger point. And here comes your job by meticulous palpation of the muscle from insertion to origin of the muscle.**

* **Myospasm: involuntary CNS induced chronic muscle contraction (in rest and function). Either due to local factors (fatigue, electrolyte imbalance in the muscles) or systemic factor like musculoskeletal disorder that affects masticatory muscles.**
* **Can be triggered by continued deep pain input and stress**

**History: 1. sudden onset of pain**

 **2. tightness العضلات مشدودة**

 **3. restriction in the jaw movements associated with muscles rigidity. The ptn will complain that he experienced a sudden pain with increased tightness and he couldn’t move his jaw freely.**

**Clinically: 1. Structural dysfunction (marked restriction in the range of jaw movements).**

 **2. acute malocclusion (the ptn can’t return into intercuspal position).**

 **3. pain at rest**

 **4. pain at function**

 **5. local muscle tenderness**

 **6. muscle tightness**

* **Centrally mediated myalgia (chronic myositis): its originated from CNS but affects peripherally the muscles. CNS impulses are sent up to muscular and vascular tissues producing neurogenic inflammation. (It’s also called CNS mediated myalgia).**

**History: long history of consistency of pain.**

**Clinically: 1. structural dysfunction**

 **2. pain at rest**

 **3. pain at function**

 **4. local tenderness, muscle tightness and muscle contraction**

* **Fibromyalgia: It’s a systemic disorder that diagnosed easily by the presence of 3 quadrants of the body out of 4 are affected or 11 muscles out of 18 predetermined sites for three months or longer.**
* **Ptns clinically may have poor quality sleep, structural dysfunction, pain at rest, pain at function and trigger points.**
* **Tender points don’t produce heterotopic pain when palpated (while in trigger point myalgia does).**

**Now we will discuss temporomandibular joint disorders**

**Temporomandibular joint disorders are one part of the TMDs. It causes either loss of normal disc movement due to elongation of collateral ligaments and retrodiscal lamina or thinning of posterior border of the disc. Trauma is another cause, it could be either micro or macro. Para functional habits (bruxism), chronic muscle hyperactivity, orthopedic instability are types of microtrauma in the TMJ in which the condyles are overworking resulting in disc dislocation or displacement. Macro trauma like blow to the area leads to other consequences like inflammation then elongation that leads to chronic problem that results in thinning of the disc.**

* **Derangement of the condyler-disc complex:**

**Most of the temporomandibular joint disorders are due to trauma (macro or micro) which leads to elongation of the collateral ligaments where the relation between the condyle and the disc changes due to that. Usually the disc is located more anteriorly by the superior pterygoid muscle. You might think displacement and dislocation have the same meaning but here displacement means the disc has moved a little bit from its original place, while dislocation means that the disc has totally moved from its regular position. Displacement occurs anteriorly since there is no space posteriorly. Looking at the anatomy of the TMJ we can see that normally the superior head of the lateral pterygoid muscle inserted in the anterior part of the disc, so continuous contraction of the superior head might cause displacement or dislocation. It is initiated as a slight disc displacement anteriorly and a little bit medially. When it gets more serious, it will cause disc dislocation with reduction at the first stage or without reduction at the second stage.**

* **So, it includes: 1. Displacement 2. Dislocation with reduction or without reduction**

**The cause of displacement is thinning of the posterior part of the disc and elongation of the associated fibers which forces the disc to slip a little bit anteriorly by superior lateral pterygoide muscle. (the disc still located on the top of the condyle)يعني بتتزحلق قليلا بدون ما يتغير موقعها**

* **During Opening and closing >> an abnormal condyle movement over the disc will result in a clicking sound.
So, here we hear two clicking sounds one at the start of the opening and the second should be at the end of closing right before maximum intercuspation occurs.**
* **Clinically: 1. Joint sound 2. Normal range of jaw movement at centric and eccentric.**

**……………………………**

* ***Dislocation with reduction*: further thinning and elongation of fibers resulting in the condyle completely dislocated anteriorly. The ptn can’t manipulate the jaw to reposition the condyle on the posterior border of the disc and the disc is said to be reduced.**
* **Disc dislocation with reduction also causes clicking sound, but dislocation without reduction doesn’t cause a click.**
* **Dislocation with reduction >> the condyle will return to its position under the disc (recapturing it).**
* **History: long history of clicking, and joint catching with/without pain.**
* **Clinically: limited range of movement. (it happens in this way -> opening then click then deviation and then a normal range because after the click both the condyle and the disc returned back to their right place).
\*\*you should know the difference between deviation and deflection.**
* ***Dislocation without reduction* resulted from excessive elongation and the disc is forced further more anterio-medially by the condyle, and the disc can’t be reduced to get back to normal position while opening. Deflection happens here not deviation. (Opening- deflection- limited range of movement of 25mm while the normal should be 40mm).

\*\*\*These videos were shown in the lecture and are very helpful understanding the concept above:
-** <https://www.youtube.com/watch?v=9h2CXfUjuvA> **-** <https://www.youtube.com/watch?v=QTihztWMv4k> **-** <https://www.youtube.com/watch?v=fyHGOOhxHGs>
* **History: 1.ptn knows and recognized when the dislocation occurred and report that the jaw was locked.**
* **2.Previous history of clicking كان سابقا يسمع صوت و هلأ بطّل يسمعه**

**Dislocation without reduction >> the condyle will never return to its proper position under the disc and separation between them occurs. (the disc in front and the condyle is behind)**

* **Clinically : 1. Range of movement is limited**

 **2. mandibular deflection to the involved joint**

 **3. lateral movement is normal on ipsilateral side but restricted on the contralateral side**

 **4. bilateral loading is painful**



* **Structural incompatibility of the articular surfaces : means there is a problem in the articulating surfaces either :**
1. **In the form / morphology of the condyle or disc or glenoid fossa by flattening, thinning, perforations or bony protuberances. مشكلة بتكوين/ شكل الأسطح**
* **They have history of a long term dysfunction/deviation at a particular point in opening and closure (problem in range of movement)
\*\*Bony protuberance might cause trauma to the joint leading to hemarthrosis.**
1. **Adhesions and adherence: due to chronic inflammation of the joint.**
* **Causes are: prolonged static loading of the joint, loss off lubrication, and secondary to hypoxia.**
* **Adherence: temporary sticking between disc-condyle or disc-fossa happens first and might develop into adhesion (formation of fibrous tissue and its more chronic).**
* **Clinically for both: the ptn feels sticking in the joint at certain moment during movement but continues the movement normally.**
* **In both the ptn doesn’t feel pain contrary to dislocation without reduction.**
* **There is superior joint adhesion and inferior joint adhesion.**
* **superior joint adhesion: adhesion space between the disc and glenoid fossa. At early stages, only rotation occurs and normal joint translation is inhibited leading to limited mouth opening but at later stages due to long standing adhesion the ligaments become elongated and the condyle translates forward leaving the disc behind and would appear like disc is posteriorly dislocated (so the forward movement will be normal but there is a difficulty upon closure and turning back into occlusion). It’s the only case where you will see the disc posteriorly dislocated or displaced.**
* **inferior space adhesion: happens between the disc and the condyle. بلزقوا ببعض زي قطعة واحدة No rotation is allowed but translation is normal (mouth opening just inhibited; cant rotate but he can translate).**
1. **Hypermobility (or called subluxation): occurs in elderly ptns . its a sudden forward movement of the condyle-disk during mouth opening causing the condyle to set beyond the crest of the eminence ( usually the movement of the disc and condyle is up to the eminence not beyond it ) . No pathological changes it is just an anatomic variation in ptns have short and steep posterior slopes of the eminence .**
* **History : ptn reports locking when the mouth is widely opened.**
* **Clinically : during mouth opening there will be a depression in the face behind the condyle , and no pain is observed.**
1. **Spontaneous dislocation : occurs when the ptn opens his mouth, the condyle-disc forced beyond the eminence and become locked there. He can’t close his mouth again unless you helped him to close and repositioned the condyle posteriorly. So, its hyper extension of the TMJ resulting in fixation of the joint in an open position preventing any translation.**
* **Causes: anatomic predisposition, yawning, muscle fatigue, sudden contraction of inferior pterygoide muscle.**
* **Clinically: sudden locking of the jaw with upper and lower anterior teeth separating and posterior teeth are closed. And it’s painful.**

**\*\* the doc didn’t focus on the coming categories and she said ; just we should know generally about them and mainly focus on the disorders of the muscles and joint disorders \*\***

* **Inflammatory problems

They can be: synovitis, retrodiscitis, capsulitis, osteoarithritis, osteoarithrosis, polyarithritis and many …**
* **Causes: trauma and infections.**
* **Clinically : 1. pain in the perioricular area**

 **2. Pain on function**

 **3. Limited range of movements**

 **4. Cripitation sound**

**……………………………………………………………………………………..**

 **This is the third group of TMDs**

**Chronic mandibular hypomobility**

**Includes:**

 **1. Ankylosis**

**2. Muscle contraction**

**3. Coronoid impedance (the coronoid is extremely long or fibrotic) might be due to trauma, infection or surgery.**

 **- Ankylosis is diagnosed usually by double radiography.**

**- Ankylosis happens when: Trauma and/or infalamation >> fibrous adhesions >> become bony >> ankylosis**

**Clinically: restricted range of movements, deflection and NO pain.**

**These are certain questions you can ask your patient:

\*Do you have pain in the face in the front of the ear?
\*Did you get headaches, neckaches, earaches or cheek pain?
\*When was the pain occurring?
\*when was the pain at its worst (in the morning, in the evening, after the insult…)?
\*Do you experience pain when using the jaw or opening the mouth?
\*Do you experience pain in the teeth? (to distinguish if this is a tooth problem or a TMD)
\*Do you experience joint noises?
\*Did your jaw ever lock or got stuck?
\*Does your jaw motion feel restricted?
\*Have you had any jaw injury?
\*Have you had treatment for jaw symptoms before?
\*Do you have any other muscle or bone problem (such as arthritis)?**

**These questions are targeting the TMDs to know if the ptn has a problem.**

 **Good Luck**

**Corrected by: Mohammed Gara**