

No more jaw clicks -TMD's A Myriad of Controversies- A Systematic Review

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ABSTRACT

Medicine is a science of uncertainty and an art of probability. A unique joint in the facial region which affects the functioning of the entire orofacial structure forms the hallmark of controversies due to its multifactorial etiology and multi dynamic diagnosis and treatment approach. Depending on the type of TMD, many treatment modalities have been proposed, ranging from conservative options to open surgical procedures. In this review, the present thinking in the etiology and classification of TMD, followed by the diagnostic approach and the current trend and controversies in management is discussed. Diagnostic criteria with differentials for any TMD ailment is explained and simple pragmatic approach to diagnose TMDs is recommended.

What makes the diagnosis and classification of TMD complicated at times is that many patients present with multiple diagnoses of TMD simultaneously, and it is impossible to isolate the condition to a single particular cause. There are 12 most common diagnoses of TMD described in Axis-I of the DC/TMD, which are divided into painful conditions (myalgia, local myalgia, myofascial pain, myofascial pain with referral, arthralgia, headache attributed to TMD) and non-painful conditions (disc displacement with reduction, disc displacement with reduction with intermittent locking, disc displacement without reduction with limited opening, disc displacement without reduction without limited opening, degenerative joint disease, subluxation). Differentiating one from the other requires thorough understanding and crystal clear knowledge of the ailment and its progression. Amid controversies of various theories put forward and multidynamic treatment approach, we all believe that the valid diagnosis is the key to successful treatment on account of TMD multifactorial nature and often of patients suffering from other disorder simultaneously that can make the correct diagnosis difficult. This review serves as an insight to the diagnostic criteria and easy treatment planning for TMDs.

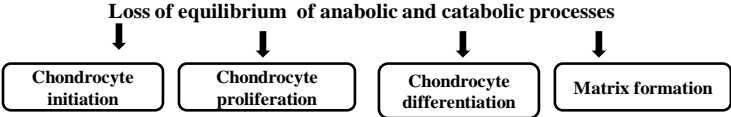
Introduction:

Orofacial pain is the speciality of dentistry that encompasses the diagnosis, management and treatment of pain, disorders of jaw, mouth, face and associated region. *The value of experience is not in seeing much, but in seeing wisely*, as said by William Osler, this forms the hallmark of the discussion of the topic stated above. Prompt and clear diagnosis with apt treatment plan can erase all the controversies related to any disease.

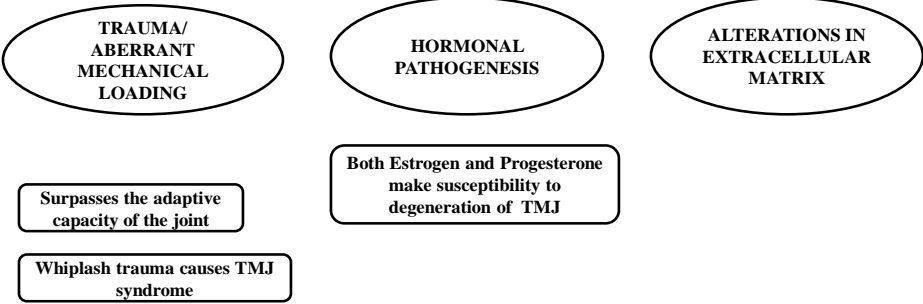
Listen to the patient, he is telling you the diagnosis, golden words of Sir William Osler, this should be the aim of every practitioner to diagnose any disease as early as possible. Good understanding of the temporomandibular joint nosology is necessary to

manage patients with specific diagnostic criteria.^[1] Temporomandibular joint disorders are a group of orofacial conditions which are the most common non dental pain complaints in the maxillofacial region. Complexity in ethology, structure and myriad of overlying clinical features makes TMD's diagnosis difficult and a challenge for the oral physicians.

PATHOGENESIS



BASIC ETIOLOGY



Pathogenesis of TMDs

MASTICATORY PAIN

LIGAMENTOUS PAIN

RETRODISCAL PAIN

EAGLE'S SYNDROME

BULIMIA NERVOSA

CAPSULAR PAIN

TRIGEMINAL NEURALGIA

GLOSSODYNIA

OTALGIA

ARTHROITIC PAIN

GLOSSOPHARYNGEAL NEURALGIA

SJOGREN SYNDROME

CEPHALGIA

TRAUMATIC NEUROMA

PAIN

Pains associated with Temporomandibular Joint

What makes TMD's a controversy?

Despite extensive clinical research, modern diagnostic modalities and vast era of modern treatment plans. TMD's diagnosis is a controversial topic which gives different views by different physicians. The very first reason which makes it a controversy is the classic structure of the Temporomandibular Joint not as common as the different joints of the body.^[1,2]

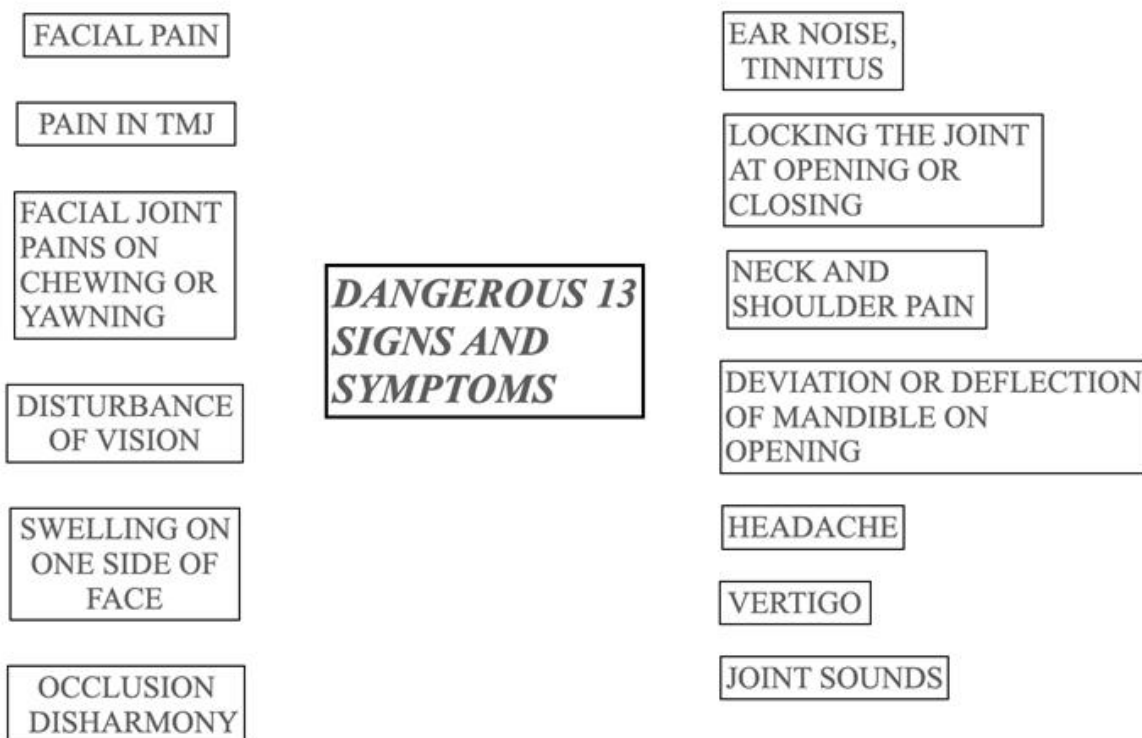
As said by Yoko Ono, *Controversy is the part of nature of art and creativity*; ample of controversies exist in literature regarding the diagnostic and management protocol for TMD's, starting with the anatomy, uniqueness of this joint and its functioning makes it a controversy. Since the Pre Costen era, different physicians gave different concepts of ethology and pathogenesis of temporomandibular joint disorders. When Sir Daniel Haskin provoked TMD's to be a cause of craniomandibular syndrome, Mc Collin kept forward the gnathological concepts. Dr Bernard Jankelson gave us the Myomotor concept of etiopathogenesis when Sir

Farrar and Sir Mc Carty put forward the etiology of internal derangement to coverup the TMD's etiology. Dr Gold along with Internal derangements gave the condylar repositioning concepts due to the complex anatomy of this joint. This gave birth to the multi dynamic approach of the temporomandibular joint disorders stating its complex etiology affected by the structure multitasking of by ADA in a conference in 1989.^[2]

In today's era molecular level of pathogenesis of TMD's is the new trend studied due to the combination of extensive research in this field. This brought us to a conclusion that TMD's cannot be treated by a single physician, complexity in its anatomy and etiology with clinical features require a multidisciplinary approach for treatment and planning.^[3]

As said by Sir Bernard Jankelson '*If it's measured, it's a fact, otherwise it's an opinion.*' Diagnosis of TMD's based on the clinical features. 3 major signs which the patient shows is pain, click or involvement of systemic disorders. The 13 dangerous knockout features which makes TMD's a multidisciplinary treatment approach are:

DANGEROUS 13 SIGN AND KNOCK-OUTS



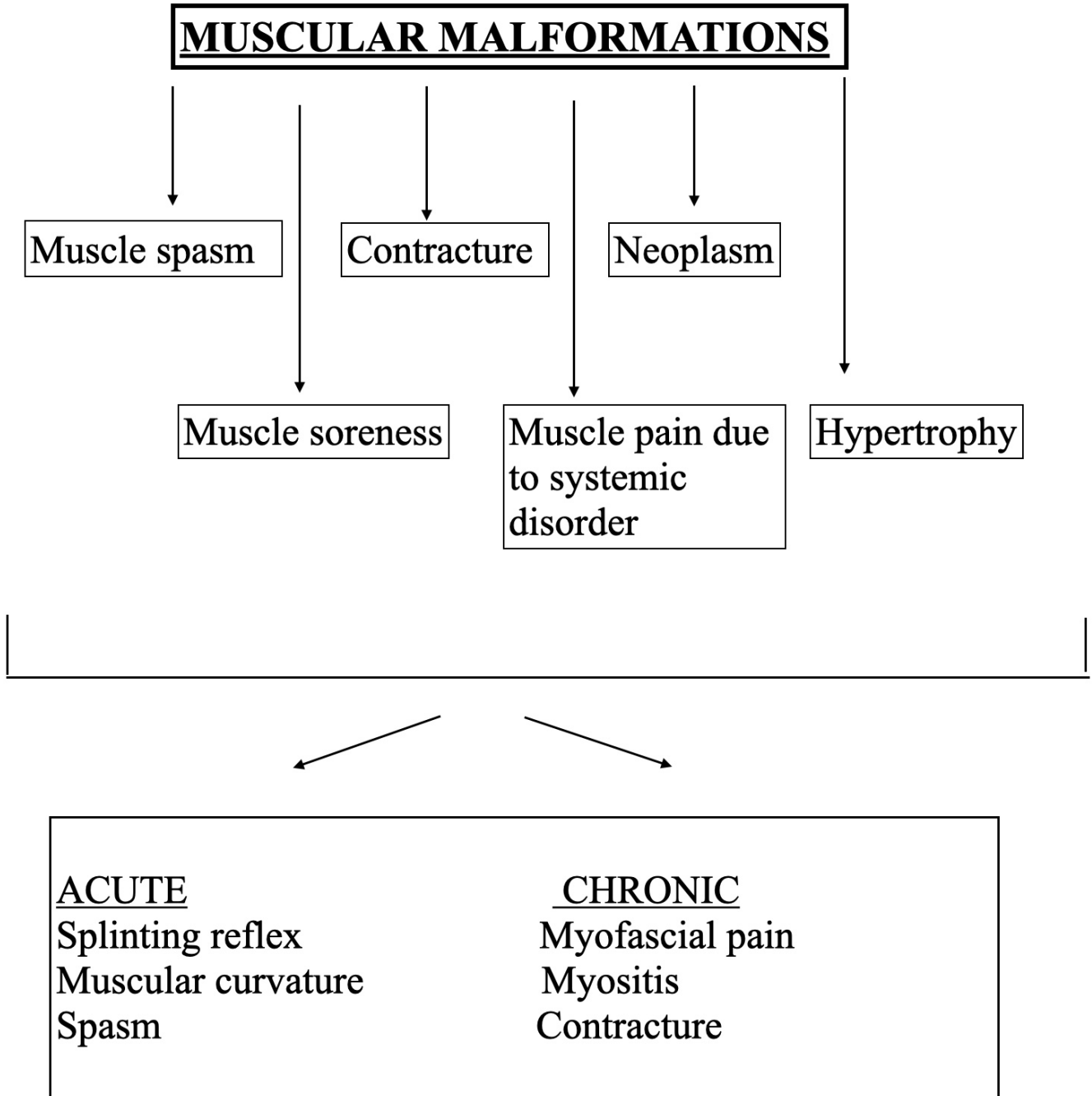
Signs and symptoms of Temporomandibular joint disease

'If it matters it produces controversies', as said by Dr Jay Greene, physicians should adopt a diagnostic approach for TMD bases on normalised and standardised clinical methods now available complemented by photographic and radiographic images. Primary imperative in temporomandibular joint disorders is to adopt a global, bio -psychosocial viewpoint. Secondary approach is to make an exclusion analysis, ruling out non TMD pathology which has far more serious prognosis. A

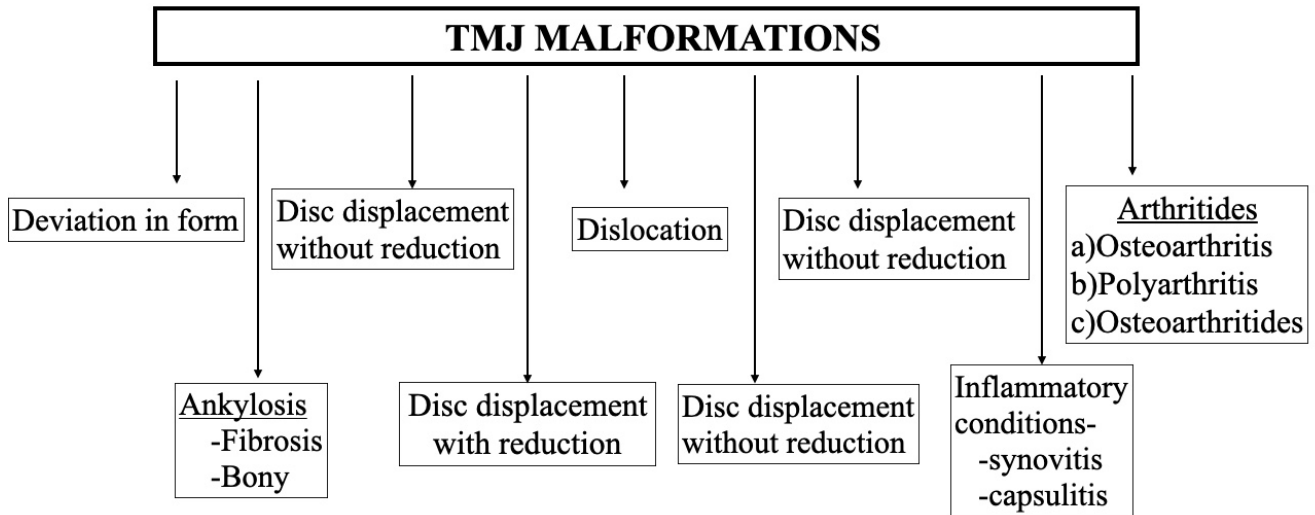
diagnostic criteria should be adopted and based on it a prompt diagnostic classification needs to be flashed the physicians mind^[4]

Diagnostic classification:

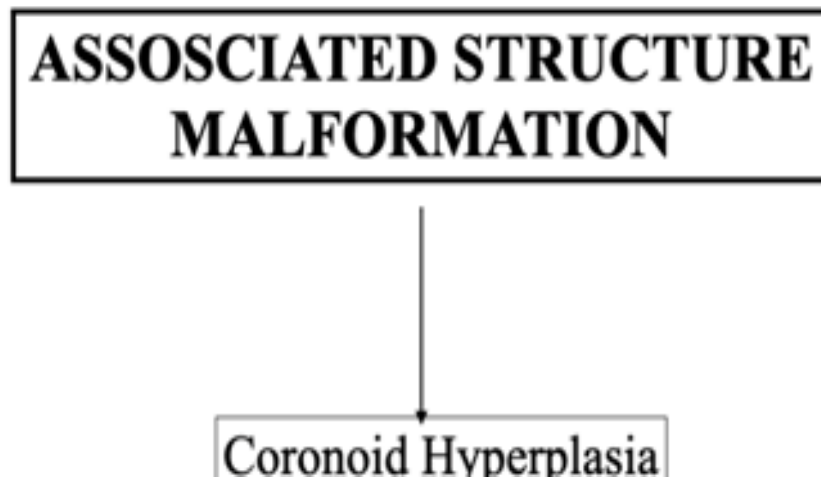
- 1) Muscular malformations
- 2) TMJ malformations
- 3) Associated structure malformation



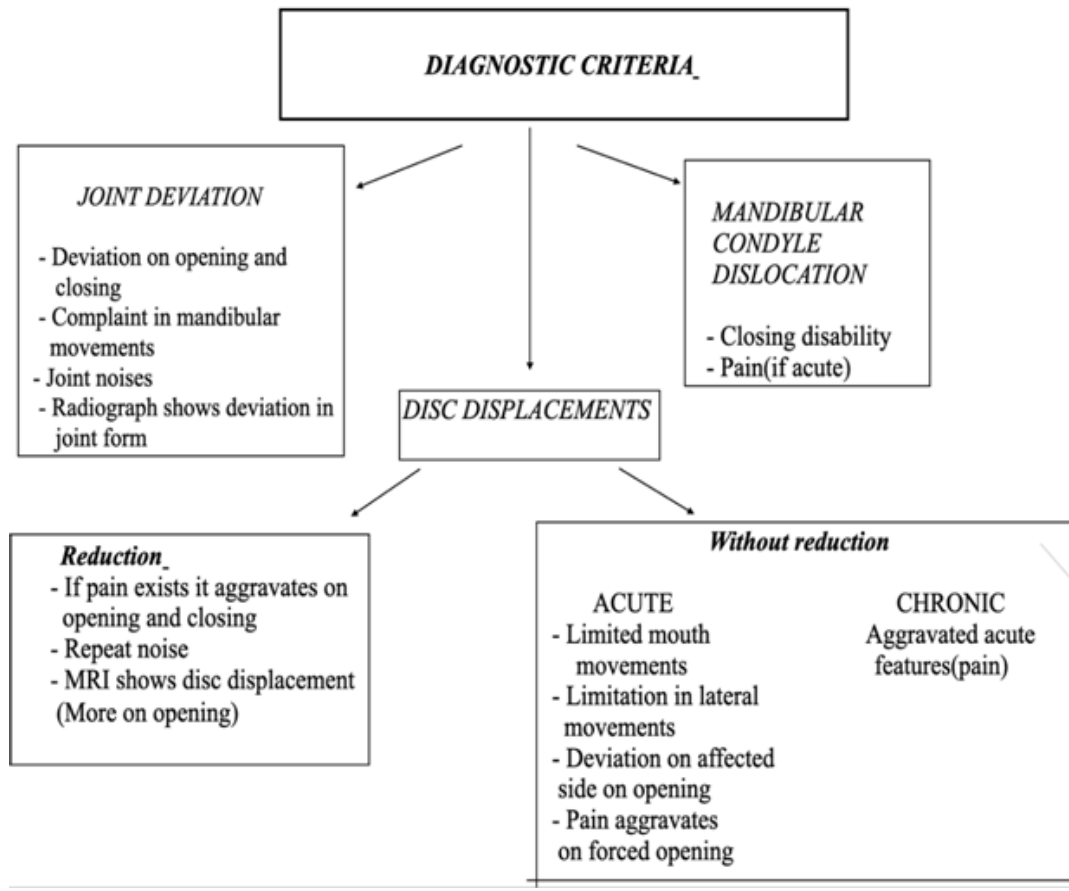
Muscular Malformations

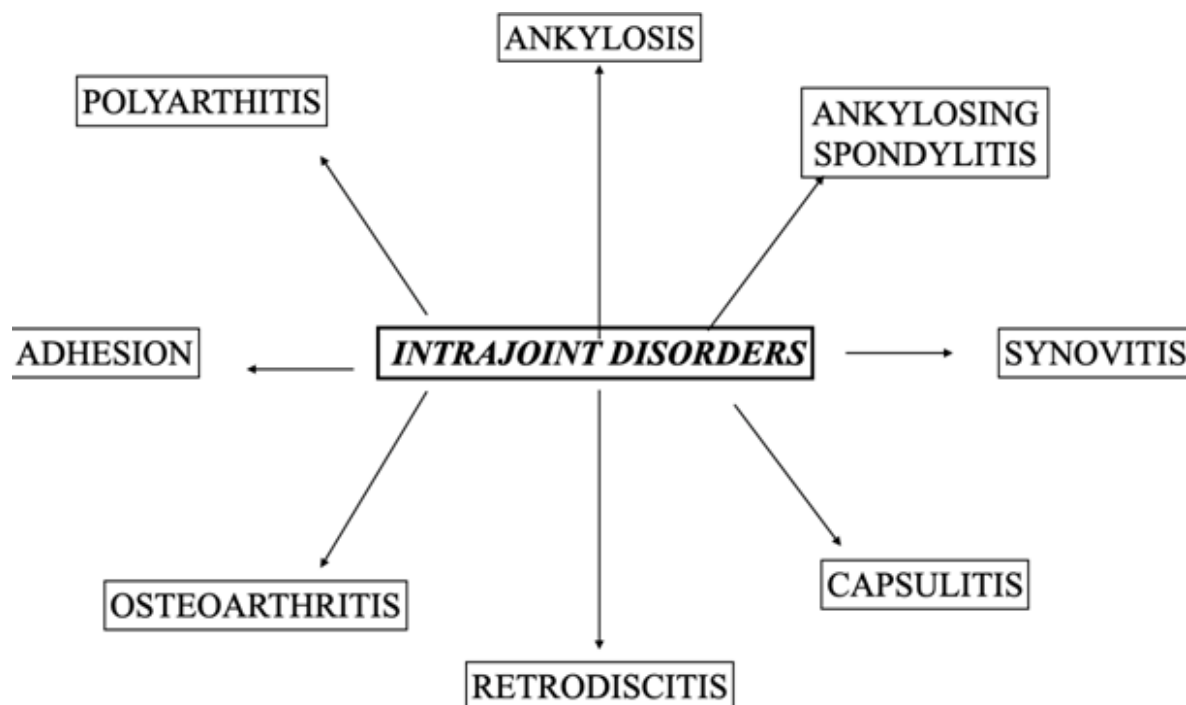


TMJ Malformations



Associated structure malformation

Diagnostic criterias:**Intrajoint disorders:**



Ankylosis:

Fibrosis

- Reduced opening limit
- Distinctive deviation to the affected side.
- No translational movement

Bony

- Mandibular movement limitation
- Deviation to the affected side
- Lateral movement to the the unaffected side is limited
- Bony proliferation on radiograph

Ankylosing spondilitis:

- Stiffness in muscles
- Pain
- Reduced mandibular movements
- ON XRAY-
- Bony erosion
- Narrowing of joint space
- sclerosis

- Absence of subchondral bone

Adhesion

- Jolt during mouth opening
- Rotational movement not possible

Synovitis

- Posterior teeth cannot occlude
- Fluctuant swelling
- Local pain severe on movements

Capsulitis:

Difficult to differentiate it from sinusitis

Microtrauma

Osteoarthrosis

- Crepitus
- Painless
- Limitation in joint movement

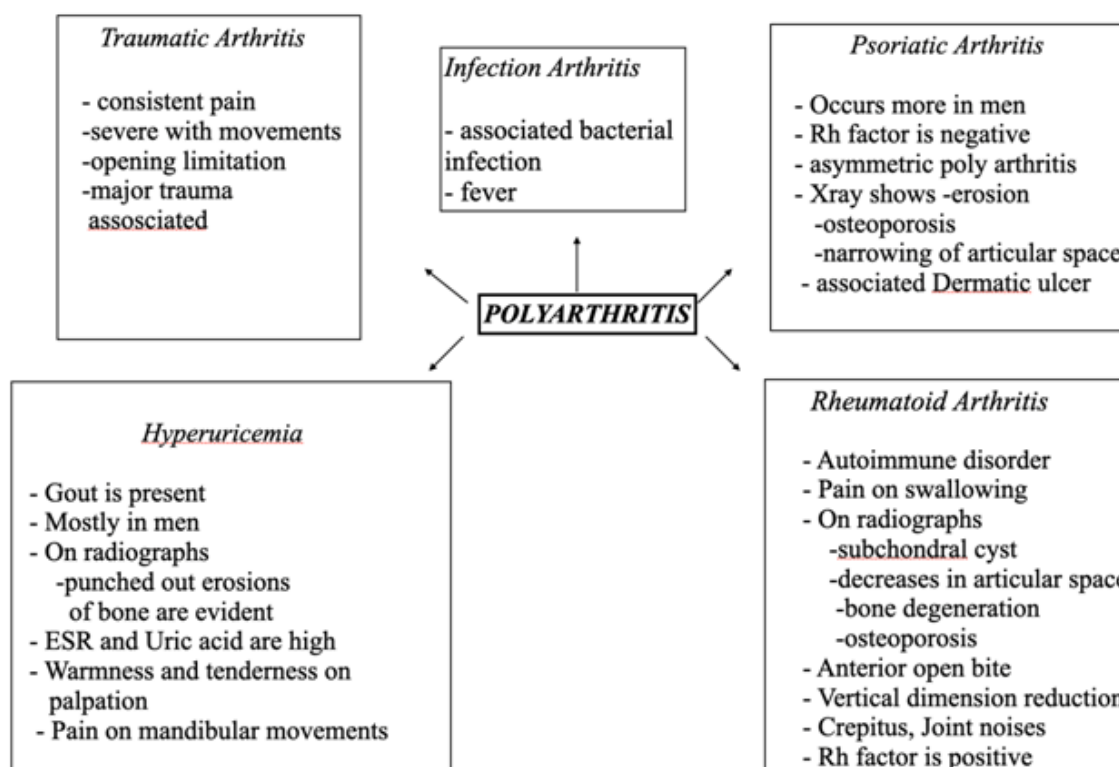
Osteoarthritis:

- Pain on function due to inflammation
- Trigger points to palpate on
- Crepitus
- Osteophytes, Subchondral sclerosis

- Limitation in movement

Retrodiscitis:

- Inflammation of joint (Tooth cannot occlude on affected side)
- Local conc. pain at rest
- Limitation on mandibular movements^[5,6]

**Certain diagnostic criterias for polyarthritidis:**

Evaluation of temporomandibular joint by the clinician is a very important step in encountering TMDs and coming to an exact diagnosis. Few questionnaires are prepared which have to be assessed by the attending physician to come to an exact diagnosis.^[5]

How do we evaluate TMJ- Special six steps:

1. Measure the range of motion
 2. Inspect symmetry and arrangement of face and dental arch
 3. Palpate for pre auricular /intermediated tmj tenderness
 4. Auscultate/palpate for tmj sounds
 5. Note-Excessive occlusal wear
 6. Inspect for tenderness in muscles of mastication^[6]
- Excessive tooth mobility
 - Mucosal lateral tongue scalloping

Fine questionnaire for TMJ disorders diagnosis

- A. Does the jaw stick/locked?
- B. Is there any difficulty or pain while mouth opening?
- C. If previously had any joint disorder?
- D. If any changes in bite are seen?
- E. If any recent injury to head?
- F. Do the jaws get stiff/ tight?
- G. If there are any frequent headaches?
- H. If there is any pain in ears, cheeks, temples?
- I. If there are any joint noises?
- J. If there is any difficulty in chewing, talking or using jaws?^[6,7]

These steps and questionnaire help us assess the temporomandibular joint and come to a provisional diagnosis, following the diagnostic criterias as mentioned.

Current concepts in Investigations for TMDs:

As it is rightly said “A correct diagnosis is three fourths the remedy”. In today’s world we have a wide variety of radiographic investigations at our disposal for diagnosing TMD’s. To begin with -MRI, a salient part of modern radiology and the most commonly preferred radiographic option for diagnosing TMD’s. Its basically a noninvasive technique, considered to be the gold standard in imaging the soft tissue components of the TMJ. MRI is used to evaluate the articular disc in terms of location and morphology. The early signs of TMD and the presence of joint effusion can also be determined. The next important diagnostic tool is CT scan. Its considered one of the best methods for assessing osseous pathology of TMJ.^[8] It allows a multi planar reconstruction of TMJ structures, thus we get 3D images in closed and opened-mouth positions thus helping us view signs of degenerative changes of jaw. CBCT is also commonly used by dental practitioners. Yet another advanced diagnostic tool used is High resolution ultrasonography. It is a noninvasive procedure and is useful in depicting disc displacement and effusion. Another important modality frequently used by the clinician is OPG. Panoramic radiograph shows the jaws and associated structures and helps identify any odontogenic or periodontal causes of orofacial pain. In the later stages even helps us visualise the degenerative bony changes. Another age old conventional method of diagnosing TMD’s is conventional radiography. This consists of transcranial projection of TMJ’s, anteroposterior projection, transpharyngeal view, submentovertex projection.^[9] Modern advancements in radiology has provided us with better modalities like T scan analysis. It

is a digital occlusion analysis system. It is a good tool for assessing force and bite dynamics. TMJ arthrocentesis - this procedure has helped us bridge the gap between surgical and non surgical treatment. It is a form of minimally invasive surgical treatment in patients suffering from internal derangement of the TMJ.^[9,10,11]

Controversial Treatment plans for TMDs:

The treatment of TMD is complicated and requires specific knowledge because of the multifactorial nature of this problem. Advancements in modern day medicine has given us a variety of options to give symptomatic relief and strengthen the jaw muscles thus leaving the clinician with a wide spectrum of TMD management options ranging from psychological to non invasive to invasive therapy in severe cases.^[12] The most important stage in treatment schedule is education with awareness training and relaxation therapy. Therapeutic exercises and muscular training is important. Moving on to pharmacotherapy NSAID’s corticosteroids, muscle relaxants, anxiolytics are given.^[13] Their usage has seemed to work wonders for many patients. The initial occlusion treatment can be given to all TMD patients attributing to the fact that masticatory muscles and temporomandibular joints are in a direct connection with occlusal relations. Intra oral appliances has been an age old treatment option for management of TMD’s. They help reduce bruxism on a short term basis. They cause reduced joint loading, associated behavioural changes- both muscular and joint responses to intra oral appliances. The most commonly used is Anterior only contact appliance.^[14] Neuromuscular oral appliances have gained popularity in the last few decade. They are anterior repositioning devices and determine the jaw position prior to occlusion therapy. TMJ arthrocentesis - a minimally invasive procedure can be done for patients suffering for internal derangement of TMJ. Occlusal splinting can also be done. Talking about the surgical approach, there are three surgical options-arthroplasty, arthroscopy and complete joint replacement. For TMD’s caused by rheumatoid arthritis or joint disease that causes bone and tissue to break down, for them arthroscopy can be used. Its main purpose is to lavage the joint or inject an anti inflammatory medicine. Acupuncture is very effective in treating TMD’s. It reduces stress, pain and inflammation and relaxes the muscles of jaw and face. TENS therapy (Transcutaneous electrical nerve stimulation therapy) it can be used an adjuvant treatment modality for management of pain in patients having temporomandibular joint disorders.^[15]

Conclusion:

TMDs represent a divergent group of orofacial pain symptoms which shares similarities with other chronic pain conditions. The etiology of TMDs is multi-factorial, and exact causes for the symptoms may be difficult to crack. In the past, focus has been placed on the physical origins of TMD, but an at least equally significant psychosocial and molecular factor is now well-recognized. Consequently, a multimodal approach, which might include counselling and psychological therapy, is being increasingly put in action. Most instances of TMD are managed conservatively and empirically during the early phases of treatment, yet lingering in the conservative phase for an extended period when clinical improvement is unclear and is still not recommended.^[15] Though open joint surgery is rare nowadays and is reserved for specific situations, we may be in the midst of a changing paradigm which favours early minimally invasive procedures.

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