Egyptian Prosthodontic Association
(EPA Newsletter)

Simplifying TMD: A Clear Overview to Etiology, Classification, and Conservative Treatment

Electronic Newsletter

Volume 3. Issue 11

November 2024

Temporomandibular disorders (TMD) encompass a group of conditions affecting the temporomandibular joint (TMJ), muscles, and surrounding structures. Symptoms of these disorders may include jaw pain, headaches, and difficulty chewing or opening the mouth.

TMD Etiological Factors:[1]

The etiology and pathogenesis of this condition is multifactorial and involves an interplay of mechanical, psychological, biological, and lifestyle factors, so for TMD to be diagnosed and treated effectively, its etiology must be understood. The following factors were crucial in the developing of TMD:

1- **Psychological Factors**

Such as Stress, Anxiety, Depression, Somatization and Poor Sleep Quality.

2- **Mechanical Factors**

a- Micro Trauma: there is a lack of evidence on the relationship between malocclusion and TMD based on DC/TMD diagnosis.

b- Macro Trauma: Whiplash-type injuries to the head or neck are commonly considered significant risk factors.

3- **Habits:**

a- Parafunctional Habits: such a Bruxism or Chewing gum habit.

b- lifestyle Habits: poor posture and high heels.

4- Genetic Predisposition: There may be a hereditary component, with some individuals more genetically susceptible to TMD.

5- Age and Gender

TMD is more common in women and tends to occur in younger adults, possibly linked to hormonal influences and stress levels.

6- Medical Conditions Associated with TMD[2] as Eagle Syndrome (Figure 1),

Fibromyalgia, Ehlers–Danlos syndrome, Gastrointestinal Disease, Thyroid

Disease, Osteoarthritis, Rheumatoid Disease, Vit D Deficiency.

Classification Of TMD:[3]

The Diagnostic Criteria for temporomandibular disorder (DC/TMD) is crucial as it offers an organized approach to the diagnosis of TMD by integrating the following:

1- Clinical assessment

2- Patient history

3- Imaging if necessary.

This standardized framework aids clinicians in simplifying the precise assessment and classification of TMD as well as provides a thorough treatment plan according to patient need

Steps of Proper TMD Diagnosis:[4]

First: Rule out other potential causes of pain, such as dental issues, neurological disorders, or systemic conditions. (table 1)

Second: check for the symptoms duration: Symptoms typically must have been present for more than three months to establish a chronic condition.

Third: classify TMD based on the criteria into three main classes(table 2)

Management of TMD:

Different conservative treatments are available, depending on the type and severity of TMD. These treatments include non-invasive techniques to improve function and relieve symptoms.[5,6]

1- Medications : Analgesics (such as paracetamol and acetaminophen) and nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly used to alleviate musculoskeletal pain. Muscle relaxants can be taken, diazepam treatment for one month has been shown to alleviate long-term jaw muscle myalgia. Tricyclic antidepressants may also be used to treat chronic myofascial pain in the jaw muscles.

2- Heat/Cold Therapy: Applying a warm compress or ice pack to the jaw can reduce pain and inflammation.

3-Dietary Changes: Soft foods that require less chewing can help reduce stress on the TMJ

TMD: Basic Diagnosis and Examination Protocol

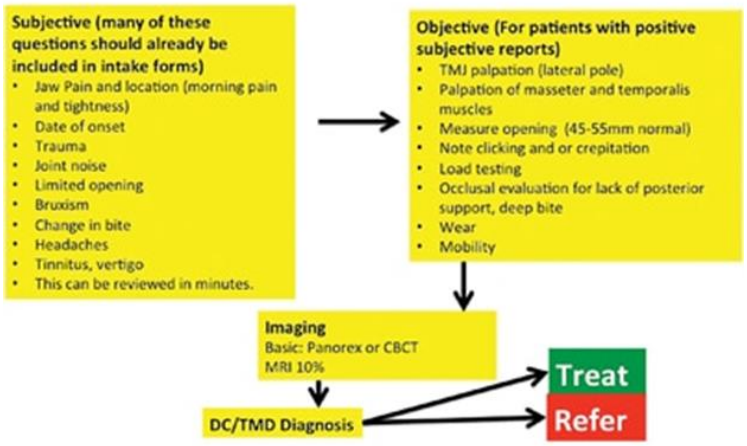


Table 1

Diagnostic Criteria For TMD

DC/TMD

Joint vs Muscle ?

Type (Etiology)	Description
I Muscle disorders excluding joint pain	Acute: myositis, exercise myalgia Chronic: tendonitis, myofascial pain, fibromyalgia, tension headache
II Disc Displacements	Reducing : clicking joint Non reducing: closed lock Subluxation-dislocation open lock
III Other Joint Pain	Joint inflammatory disease including Arthritis. neoplasms, fracture

Table 2

4- Physical therapy: is used to relieve jaw muscle pain caused by TMDs.

a- Active exercise of the particular painful part of the head and neck region strengthens the muscles, improves function, and decrease pain.

b- passive exercise and stretching seem to increase the range of jaw motion, but have weak influence on muscle pain.

5- Intraoral appliances:

a- **Permissive splints** such as hard stabilization splints that could be considered the main treatment of MFPD (Myofascial Pain Disorders) (Figure 2,3,4,)

b- **Non-Permissive splint** such as Anterior Repositioning Appliance (ARPS) which could be used in management of patients with disc displacement with reduction (DDR) (Figure 5)

6- Acupuncture:

Acupuncture is a traditional Chinese medicine practice that involves inserting thin needles into specific points on the body. It is often used as a complementary treatment for TMD. However there was a lack of high-level evidence for its efficacy.

7- Botox Injection : it is increasingly used in TMD treatment, particularly for muscle-related pain and dysfunction. Botox cause temporarily muscle paralysis or relaxation by blocking nerve signals to the injected areas.

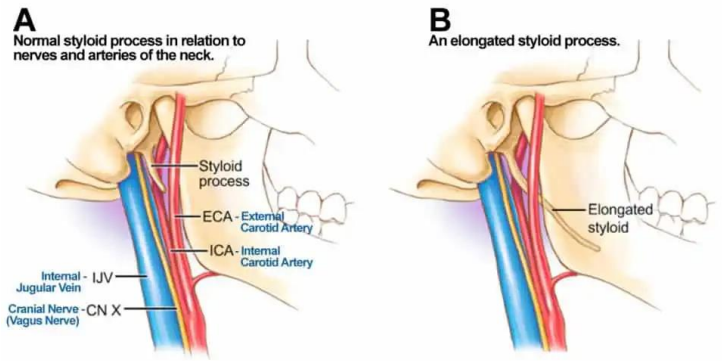
This lead to decrease muscle tension in the jaw, alleviate pain, reduce bruxism and clenching consequently, improve jaw function. However, it has a three- to six-month duration of action, so repeat injections are necessary for long-term relief. Common side effects may include temporary bruising, weakness in adjacent muscles, or headaches.[7] (Figure 6)

8- Laser therapy: particularly low-level laser therapy (LLLT), is another emerging treatment for TMD. It uses specific wavelengths of light to produce photo-biomodulation by stimulating cellular repair and decreasing inflammation in the TMJ and surrounding tissues so promotes healing and reduces pain. Multiple sessions may be required to achieve optimal results in conjunction with other treatment modalities.[8]

Conclusion

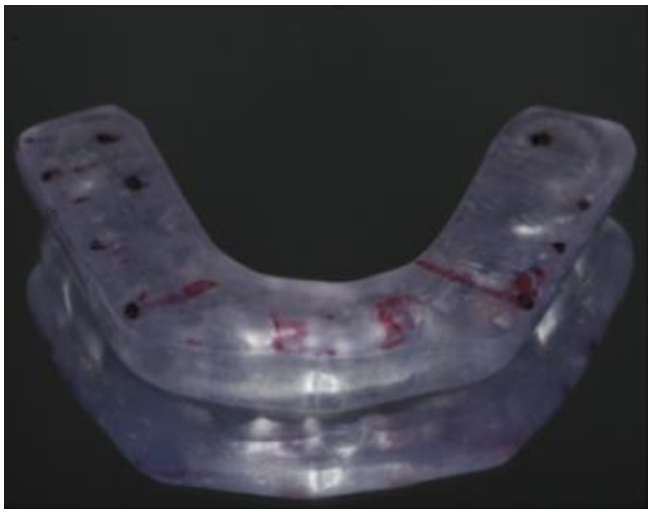
Finally, any dental treatment should be delayed until the patient with TMD exhibits signs of improvement after management, such as decreased discomfort, increased range of motion, and stable occlusal markings on the splints.

Using this guidance, enables dentists to improve patient function and comfort as well as the lifetime and success of fixed restorations. So, successful TMD management is essential to the effectiveness of fixed restorations in dentistry.



Courtesy of Olivares J[9]

Figure 1: Patient with eagle syndrome has abnormality in the length or the thickness of styloid process.



Courtesy of Ringhofer C[10]

Figure 2 : Hard Stabilization splint (HSS), the splint design should include equal simultaneous contacts on all teeth in the fully seated condylar position (FSCP) with immediate posterior disclusion in excursive movements or anterior guidance.

Courtesy of Mehta SB, et al[11]

Figure 3: Michigan splint (upper HSS)

Courtesy of Mehta SB, et al[11]

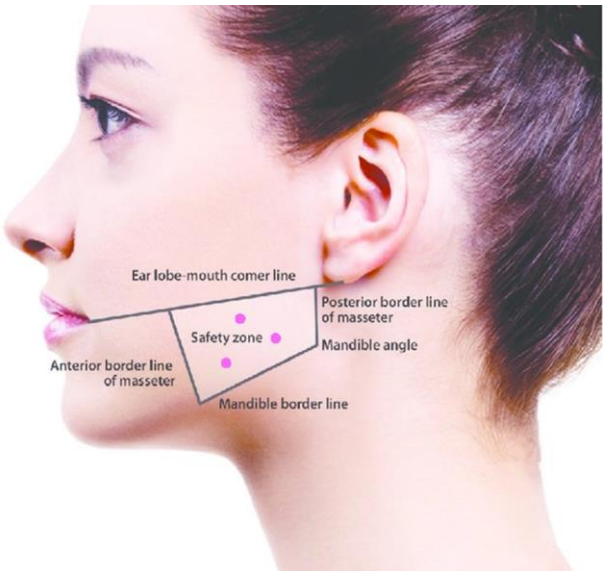
Figure 4: Tanner appliance (lower HSS)

Courtesy of ALBAGIEH H, et al[12]

Figure 5: Anterior repositioning splint (ARPS)

Courtesy of ALBAGIEH H, et al[12]

Figure 5: Anterior repositioning splint (ARPS)



Courtesy of Aesthetic plastic surgery in Asians: principles and techniques [13]

Figure 6: Reference landmarks for Botox injection. A quadrangular zone is drawn demarcating the area in which the masseter is well-developed and is at a safe distance from vital anatomic structures. Three injection points are selected taking into consideration the diffusion potential of the toxin

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