

Temporomandibular Disorders-Heterogeneous Disorders with need for Treatment Individualization

The term “temporomandibular disorders” (or TMD) is a collective term used to describe a group of craniofacial pain problems that involve the jaw, temporomandibular joints (TMJs), muscles of mastication, surrounding bony and soft tissue components, and associated head and neck, musculoskeletal structures or any combinations of these. Most frequently the patients present with pain, limitation and/ or deviation of the jaw opening and TMJ sounds (clicking). It may be associated with other symptoms, including ear pain and stuffiness, tinnitus, dizziness, cervical pain, and headache. Some patients may present with acute onset with self-limiting symptoms.

Patients with TMD symptoms present over a broad age range; however, in most cases presenting symptoms are usually between age 20 and 50, an unusual distribution for a disease that is considered a degenerative disorder. The symptoms occur disproportionately between the sexes with a much higher incidence reported in females (female-to-male ratio ranging from 3:1 to 9:1). Women being premenopausal, elevated levels of estrogen have been found in them. However, no definitive link between these hormones and causation of TMD has been established, and it is believed that it is a multifactorial process secondary to muscle hyperfunction/ parafunction, trauma, hormonal influences, and articular changes within the joint. Though cone beam computed tomography scans, and panoramic radiographs provide detailed imaging of the joint's bony structures, MRI is the modality of choice for examining soft tissues, including the disc position and morphology (gold standard) as it may also reveal degenerative bony changes. Treatment strategies, however, should not be dictated by MRI findings alone.

Numerous factors may play a role in the progression of TMD. Consequently, each patient needs to be analyzed uniquely and treatment approaches customized to address specific disease characteristics of the patient. Despite the high prevalence of TMD (>5% of the population), only a small percentage of afflicted individuals seek treatment. The natural history of this disorder suggests that in up to 40% of patients, the symptoms resolve spontaneously; so only up to 5 to 10% of those with symptoms actually require treatment.

A multidisciplinary approach involving multiple specialties, including general dentistry, oral medicine, orofacial pain, orthodontics, oral surgery, physical therapy, and psychiatry may be necessary to address the problem from all angles adequately. Treatments for the various TMJ disorders range from physical therapy and non-surgical therapies to different surgical procedures. Usually, the treatment begins with conservative, non-surgical therapies first, with surgery left as the last option. The majority of the TMD patients are successfully treated by non-surgical therapies, and surgical interventions may be required for only a small part of the TMD population. All non-surgical treatment options must be exhausted before undertaking the invasive methods for the management of TMD. Many of the treatments mentioned below often work best when used in combination. The treatment can be divided into 3 broad categories: noninvasive, minimally invasive, and invasive management. Exploring non-invasive modalities first, there is a progression of treatment only after the failure of more conservative modalities. Treatment modality for each patient is to be individualized, keeping in view the symptomatology as well as the likely etiopathogenesis. In general, non-invasive modalities are most frequently adopted followed by minimally-invasive ones; major

Access this article online



Website:
www.jmsskims.org

DOI:
<https://doi.org/10.33883/jms.v22i2.463>

How to cite this article: Baba PUF, Hafiz A. Temporomandibular disorders - Heterogeneous disorders with need for treatment individualization. jms [Internet]. 2019May28 [cited 2019 May 28]; 22(2). Available from: <http://www.jmsskims.org/index.php/jms/article/view/463>

Received: 28-05-2019 Accepted: 28-05-2019

surgical procedures are least practiced and the last among the options available. For less than 5% of TMD patients in whom non-surgical methods fail, open joint surgery may be necessary to restore mandibular motion and mitigate orofacial pain. The ultimate goals of any of the modalities are: 1) Decreasing joint and masticatory muscle pain and inflammation, 2) Increasing mandibular range of motion, 3) Preventing further joint damage, and 4) Improving the overall quality of life and reducing disease-related morbidities.

Reassurance and Counseling/ Behavioral Approaches: It is important for the patient to receive counseling on the natural history and course of temporomandibular disorders (the role of stress and parafunctional habits such as clenching and grinding of the teeth). Counseling, relaxation techniques, stress management, work pacing, guided imaging, biofeedback, cognitive therapy and other behavioral approaches to treatment have all been reported as helpful. Although it is not prudent to immobilize the mandible, the patient should be instructed to avoid extremes of mechanical movements (e.g., yawning, laughing, and jaw clenching). Certain habits that may affect jaw function, such as chewing gum and biting fingernails or pencils, should be eliminated.

There are numerous systematic articles that support the efficacy of exercise therapy, thermal therapy, ultrasonography and acupuncture in reconditioning and retraining the masticatory and the other craniocervical muscles that are usually involved in temporomandibular disorders. These help to relieve musculoskeletal pain, reduce inflammation, and restore oral motor function. Acupuncture is thought to stimulate the production of endorphins, serotonin, and acetylcholine within the central nervous system, or it may relieve pain by acting as a noxious stimulus. The main aim of the pharmacotherapy is i) to treat the underlying disease process, and ii) to alleviate the disease associated symptoms. Nonsteroidal anti-inflammatory agents are often of value in the acute stage. The tricyclic antidepressants and some of the newer selective norepinephrine- reuptake inhibitors (e.g., duloxetine) have shown some efficacy. Anxiolytic agents, such as the benzodiazepines, are also commonly used. Short-term use of the long- acting benzodiazepines in low doses, typically at night, is recommended (diazepam, 2.5 to 5.0 mg; clonazepam, 0.5 mg).

Splint Therapy: Various types of splints had been in use since the eighteenth century for the treatment of TMJ disorders. Introduced by Karolyis in 1901, oral splints are being identified as the most commonly used treatment and have been reported as being the most widely adopted choice. Many types of intraoral appliances exist for the treatment of TMD's, and their multiplicity suggests that the optimal design is yet to be discovered. The most common appliance is one that is custom-made of hard acrylic and fits over all the teeth in the dental arch (upper or lower). These devices are worn on the teeth like a retainer or a removable denture. They are designed to improve function of the TMJ by altering joint mechanics and increasing potential mobility, to improve the function of the masticatory motor system while reducing abnormal muscle function, and also to protect the teeth from jaw clenching and potential tooth fracture or attrition. Another theory stipulates that the success achieved with oral splints is due to the repositioning of the displaced TMJ in a more "therapeutic" or "concentric position" within the temporal fossae, thus, improving the maxillo-mandibular relationship and eliminating the muscle imbalance and its resultant pain. According to this theory, the presence of the splint as a foreign object in the mouth would likely change the oral tactile stimuli, decrease the oral volume and space for the tongue, and make the patients conscious about the position and potentially harmful use of their jaw. So these devices may make patients more conscious of their oral parafunctional habits, altering proprioceptive input and central motor system areas that initiate and regulate masticatory function (often called the oral central pattern generator). This increased awareness would influence the patients' learning to alter or reduce their harmful behavior and therefore contribute to the overall success of the intervention. Despite the nearly universal prescription of oral splints in the treatment of TMDs, the quality of the evidence supporting the mechanisms of action suggested for their presumed efficacy is still questionable. Although literature has shown mixed results associated with splint use, the long-term effectiveness of this therapy remains controversial.

Minimally invasive modalities for the management of TMD symptoms include intra-articular injections (sodium hyaluronate and corticosteroid), arthrocentesis, and arthroscopy. Different therapeutic solutions can be injected directly into the TMJ space and allow for the targeted

treatment of inflammation and joint degeneration. The TMJ has two unconnected cavities, superior and inferior, partitioned by the articular disk. The superior space injection is the commonly used technique. However, an inferior space injection, or simultaneous upper and lower spaces injections, seemed to be more effective with increasing mouth opening and decreasing TMJ-associated pain.

Arthrocentesis/Arthroscopy: Arthrocentesis and arthroscopy are safe and quick minimally invasive procedures that are used in patients who are resistant to more conservative treatment modalities. Arthrocentesis is a method of flushing out the TMJ by placing needles into the upper joint compartment using local anesthesia or sedation. According to the most common procedure, Ringer's lactate or physiological saline is injected into the joint by the use of a needle introduced into the superior joint space. By filling the compartment under pressure, any minor adhesions are broken down or lysed. A second needle is then placed into the same joint compartment to achieve thorough flow of fluid and to allow thorough washing or lavage of the joint. The process is referred to as "lysis and lavage" and can produce good therapeutic outcomes. The effectiveness of joint lavage in those cases may be explained by the joint space expansion achieved with the introduction of fluid and by the washing out of inflammatory mediators and catabolites. On the basis of observations suggesting that increased joint friction and reduced joint lubrication are involved in the process of disk displacement, a combined technique providing the injection of hyaluronic acid at the end of the procedure to improve joint lubrication is being proposed. Oftentimes they are combined with immediate postoperative intra-articular injections and the use of occlusal splints, pharmacotherapy, and physical therapy during the recovery periods for optimal results.

When joint degeneration and pain exceed the potentials of the less invasive surgical methods, surgery as an option is always available. Most commonly, it may include discectomy, reshaping or reconstruction of the articulating

surfaces, implantation of autologous or alloplastic materials and, last of all, total joint replacement.

Evaluating the kinetics and kinematics of the TMJ enables the understanding of structure and function of normal and diseased TMJ to predict changes due to alterations, and to propose more efficient methods of treatment. Currently, the repair and replacement of pathologic TMJ tissues is an unmet need and tissue engineering presents long-term promise for meeting this demand. The need remains for tissue replacements capable of adaptation to mechanical and chemical stimuli produced by functional articulation.

Dr. Peerzada Umar Farooq Baba

Prof. Adil Hafiz Wani

**Department of Plastic Surgery,
SKIMS, Srinagar-190011.**

References

1. Meghan K. Murphy, Regina F. MacBarb, Mark E. Wong, Kyriacos A. Athanasiou. Temporomandibular Joint Disorders: A Review of Etiology, Clinical Management, and Tissue Engineering Strategies. *Int J Oral Maxillofac Implants*. 2013; 28(6): e393–e414.
2. T.T. Dao, G.J. Lavigne. Oral Splints: The Crutches for temporomandibular disorders and bruxism? *Crit Rev Oral Biol Med* 1998; 9(3):345-361.
3. LeResche L. Epidemiology of temporomandibular disorders: Implications for the investigation of etiological factors. *Crit Rev Oral Biol Med* 1997; 8(3):291-305.
4. Liu F, Steinkler A. Epidemiology, Diagnosis, and Treatment of Temporomandibular Disorders. July 2013; *Dental clinics of North America*.
5. Guarda-Nardini L, Manfredini D, Ferronato G. Arthrocentesis of the temporomandibular joint: a proposal for a single-needle technique *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2008; 106:483-6.