Review Article

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Temporomandibular Disorders: Clinical Review and a Simplified Algorithm for Management

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Abstract

Temporomandibular disorders [1] is the term used to include all functional disorders of the masticatory system which includes the masticatory musculature, the temporomandibular joints and the associated structures.There has been a reported incidence of atleast one sign of temporomandibular disorder in as much as 60 to 70% of the general population.The present article is a clinical update of the etiology, sign and symptoms, diagnosis and management using a simplified algorithm.

Keywords: Temporomandibular; Etiology; Masticatory System.

Introduction

Temporomandibular disorders[1] is the term used to include all functional disorders of the masticatory system which includes the masticatory musculature, the temporomandibular joints and the associated structures. Costen [2] in 1934 was the first to describe the sign and symptoms of temporomandibular disorders. Since then multiple terms have been used to describe the condition which include Costen's syndrome, pain dysfunction syndrome, myofascial pain dysfunction syndrome, facial arthromyalgia etc.Bell [3] had suggested the term "temporomandi-bular disorders" which has gained popularity and has been accepted by the American association of orofacial pain (AAOP) [3] .The present article is a clinical update of the etiology, sign and sympyoms, diagnosis and management using a simplified algorithm.

Etiology

Understanding of the etiology of temporomandibular disorder is complex and poorly understood because the sign and symptoms of TMDs are common and no single case presents all sign and symptoms. In some cases a single treatment may not be effective even if the cases present similar features clinically. Etiopathogenesis of the disease is also confusing since the radiographic (CT and MRI) signs may also be present in asymptomatic general population. More often the radiographic picture is in stark contrast to the clinical picture.

Okeson [3] has identified five important factors associated with temporomandibular disorders including: occlusal factors, trauma, emotional stress, parafunctional habits and deep pain input. Acute changes in occlusion, trauma to joint , associated muscles and structures, parafunctional habits like bruxism, clenching etc. have more commonly been associated with temporomandibular disorders.

Sign and symptoms

There has been a reported incidence of atleast one sign of temporomandibular disorder in as much as 60 to 70% of the general population [4]. However the population presenting for treatment is just a fraction (1%) of the above. Pain and dysfunction are the commonest symptoms which may be of 1) muscular origin or 2) be related to the joint.

There are great variations in the presentation of sign and symptoms among patients but commonly are divided in to six broad groups [5,6,7,8].

1. *Myalgia* of muscles of mastication frequently, face, neck and shoulders.
2. *Joint sounds* clicking, crepitus, grating sounds.
3. *Transient catching, locking on opening* open lock and closed lock.

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4. *Pain* preauricular (related to joint), head, neck and shoulders (muscular origin).
5. *Ear complaints* tinnitus, otalgia.
6. *Psychological effects.*

Orofacial pain, joint sounds and restricted mouth opening are the three cardinal features of temporomandibular disorders. Pain is the most common complaint of patients presenting for treatment and also the most difficult to evaluate. Joint sounds are the commonest clinical feature as it is present in both patients presenting for treatment and in asymptomatic general population. In the absence of pain and / or restricted mouth opening presence of joint sound is of little clinical importance and often no treatment is indicated.

Diagnosis

Clinical history and examination is the gold standard in diagnosing temporomandibular disorders. The evaluation of the three cardinal clinical features mentioned earlier give indication of the nature of pain and dysfunction i.e. of muscular or joint origin or the presence of both which occurs frequently and also subsequently helps in management of the same.

Myofascial pain and dysfunction generally presents as diffuse pain that is cyclic in nature along the facial and masticatory musculature frequently involving the head and neck areas. Morning stiffness of facial muscles, sore teeth due to bruxism or clenching, wear facets on teeth, decreased oral opening, history of emotional stress and disturbed sleep is present.

Joint related pain and dysfunction presents as a continuous or intermittent pain that is localized to the preauricular region in and around the temporomandibular joint and is exacerbated on jaw movements. Dysfunction is commonly due to mechanical interferences due to a displaced disc often deformed in late stages of internal derangement. Such interferences produce the characteristic clicking sound of the temporomandibular joint. Crepitus or grating sound during jaw movements is pathognomic of temporomandibular osteoarthritis.

Other diagnostic methods [9-16] like radiography (plain radiographs. CT and MRI scans) electronic tests (jaw tracking, vibratography, sonography, and electromyography) and clinical diagnostic indices (research diagnostic criteria by Dworkin et al 1992) can be supplemented as aids in diagnosis and research.

Management

The natural course of temporomandibular disorders is less frequently of a progressive disease. The clinical symptoms subside over a period of time and recur due to the various interacting factors that serve to maintain the disease. The main goal of management is to reduce or eliminate pain, increase mouth opening to normal and reduce joint sounds. It is important to establish whether the problem is organic or psychogenic. Anxiety, depression and post traumatic stress disorders need psychotropic medication and psychotherapy. Management of various TMJ disorders range from physical therapy and non-surgical treatments to various surgical procedures. Usually the treatment begins with conservative, nonsurgical therapies first, with surgery left as the last option.

Conservative Management

The majority of TMD patients can be successfully treated by non-surgical therapies and surgical interventions may be required for only a small part of TMD population.

Reversible therapies are currently considered to be the firstline management of TMD. It should be instituted once organic pathology such as systemic disease, hereditary conditions, or neoplasia is excluded as a possible diagnosis. Reversible therapy include 1) patient education and motivation, 2) supportive therapy for relieve symptoms of pain and anxiety, 3) physical therapy which includes hot and cold application, ultrasound, TENS (transcutaneous electric nerve stimulation), iontophoresis and laser, 4) reversible occlusal therapy in the form of stabilization splints.

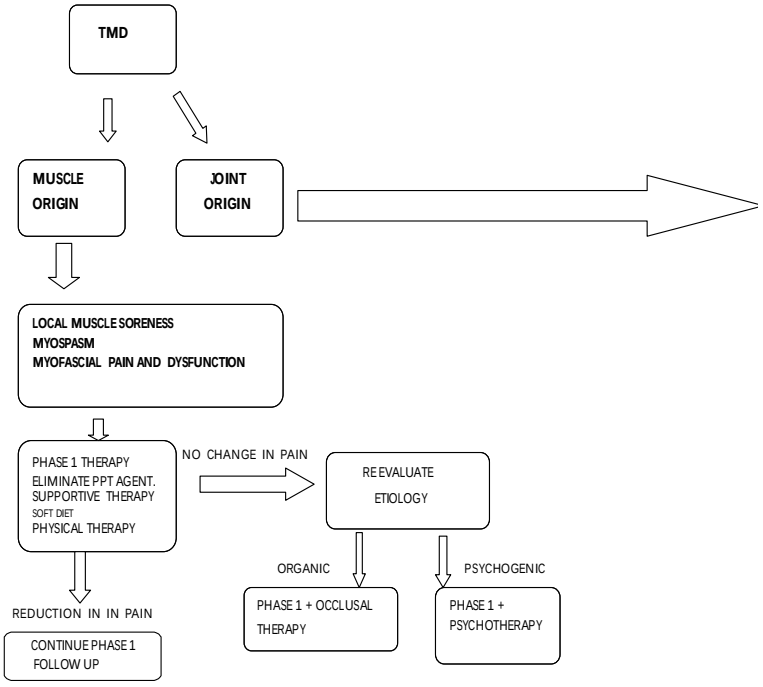
The above reversible therapy constitute the initial phase 1 management for TMD patient of both muscle and joint origin.

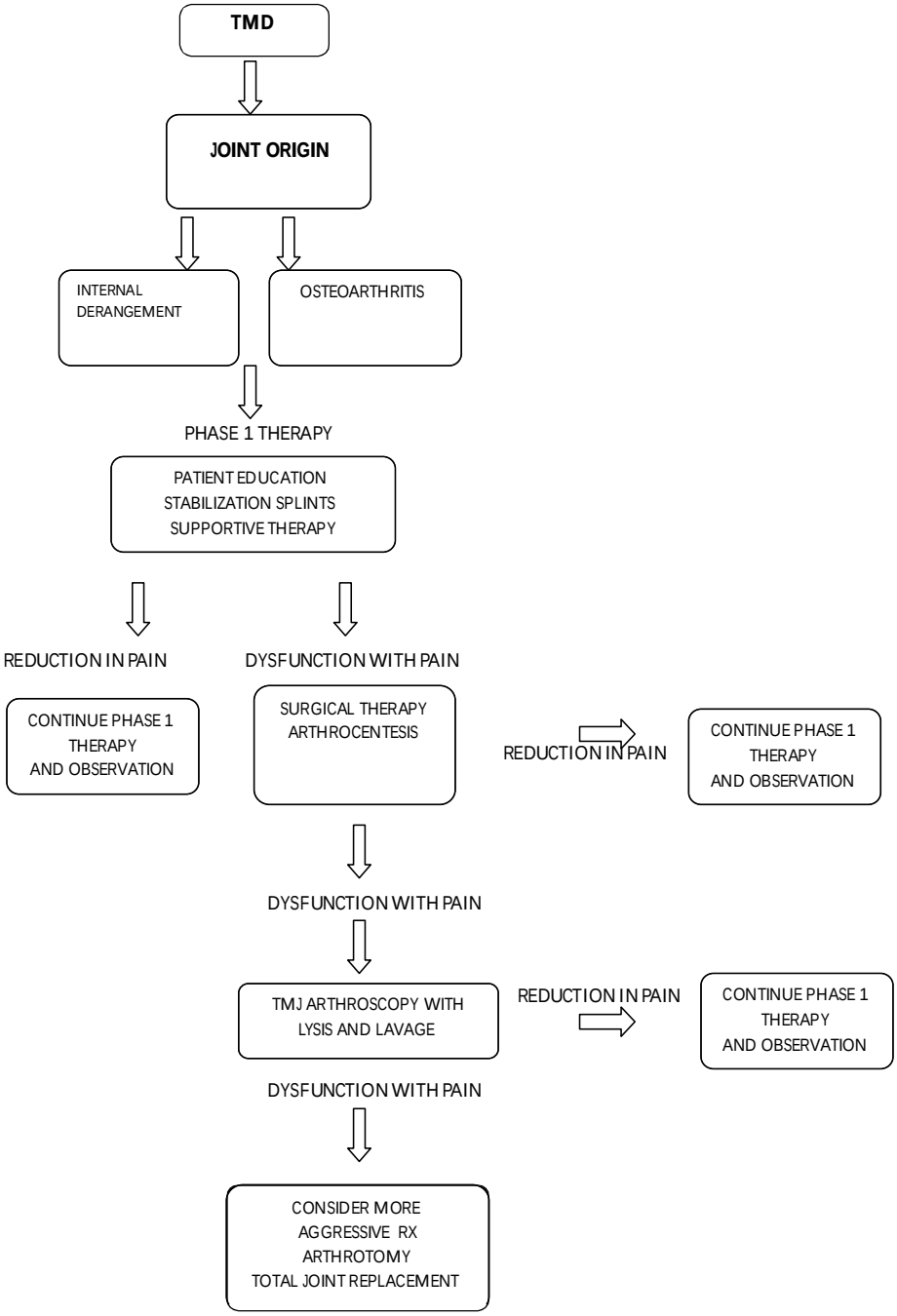
Irreversible Therapy

Phase 2 therapy (TMD of muscle origin) constitutes management for those patients that are not responsive to initial management with reversible methods. The etiology of such is re-evaluated for organic and psychogenic causes. Patients with psychogenic causes such as anxiety, depression, post traumatic stress disorder etc. are managed by psychotherapy. Patients with other identified causes of occlusal correction, condylar position, and vertical dimension are treated by irreversible occlusal therapy which constitute procedure like selective grinding, repositioning splints, restorative

Table 1: Therapy for temporomandibular disorders (the American Association of Oral and Maxillofacial Surgeons, 2013)

Masticatory Muscle Disorders	Temporomandibular Joint Disorders
A. Appropriate forms of therapy: 1. Medications a. NSAID b. Muscle relaxants c. Sedatives d. Antidepressants e. Local analgesic trigger point injections 2. Orthotic appliance 3. Physical therapy a. Exercises b. Ultrasound c. Galvanic Stimulation d. Heat and Cold packs e. TENS f. Iontophoresis 4. Dietary modifications 5. Psychological counseling **B.Favorable therapeutic outcomes:** 1. Level of pain that is of little or no concern to the patient 2. Improved jaw function 3. Improved ability to masticate food 4. Functional and stable occlusion of the teeth 5. Limited period of disability	**A. Non-surgical management:** 1. Medication (e.g. NSAIDs) 2. Orthotic appliance 3. Physical Therapy **B. Surgical treatment:** 1. Manipulation under anesthesia (e.g. brisement) 2. Arthrocentesis 3. Non-arthroscopic Lysis and Lavage and manipulation. 4. Arthroscopic surgery a. Diagnostic b. Operative 5. Open arthroplasty with or without autograft 6. Open arthroplasty with alloplast 7. Disc repair or removal, with or without replacement 8. Coronoidectomy 9. Condylectomy 10. Mandibular Condylotomy 11. Myotomy 12. Orthognathic Surgery 13. Partial or total joint reconstruction (e.g. autogenous graft, allogeneic graft and alloplastic implant) **C. Favorable therapeutic outcomes:** a. Level of pain that is of little or no concern to the patient b. Improved jaw function c. Improved ability to masticate food d. Functional and stable occlusion e. In a growing child, continued symmetrical growth of the mandible in proper relationship to the midface f. Limited period of disability g. Acceptable clinical appearance h. Absence of recurrent jaw locking or dislocation i. Limited progression of the disease





treatment and sometimes orthodontic and orthognathic corrections.

All non-surgical treatment options must be exhausted before undertaking the invasive methods for the management of TMD.

Phase 2 therapies for TMD of joint origin constitutes management of patients of internal derangement and osteoarthritis of the joint who do not respond to initial common management. Patients with joint pain and a decreased range of motion are candidates for minimally invasive treatment methods like arthrocentesis non arthroscopic lysis and lavage. Arthroscopy and arthrocentesis have been reported as minimally invasive and efficacious in the management of a range of TMD including disc displacement, arthogenous TMD, and TMD that is refractory to conservative treatment.

The correct course of action may vary, for example: medication, therapy, splints, arthrocentesis, discectomy, or prosthesis. The initial treatment does not always work and therefore more intense treatments such as joint replacement may be a future option.

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