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Review Article

Management of Temporomandibular Disorders- A Brief Review Part II

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ABSTRACT

Temporomandibular Disorders (TMDs) are one of the most common disorders in the maxillofacial region which usually present with jaw pain or dysfunction, earache, headache, discomfort in chewing and locking of jaw. Early diagnosis is important because it is proven that acute TMDs respond well to treatment in contrast to chronic TMDs. Most patients improve with a combination of noninvasive therapies, including patient education, pharmacotherapy, physical therapy, and occlusal devices. Noninvasive or conservative therapy should be attempted before pursuing invasive or permanent therapy. The aim of this article is to review the methods of management of TMDs and their outcomes.

Key words: Temporomandibular disorder, Pain and dysfunction.

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INTRODUCTION

Temporomandibular disorder (TMD) are a heterogeneous group of musculoskeletal and neuromuscular conditions involving the temporomandibular joint complex, and surrounding musculature and osseous component. TMDs affect up to 15% of adults, with peak incidence at 20 to 40 years of age.¹ Common symptoms include jaw pain or dysfunction, earache, headache, and facial pain. The etiology of TMD is multifactorial and includes biologic, environmental, social, emotional, and cognitive triggers. Only 5% to 10% of patients require treatment for TMDs, and 40% of patients have spontaneous resolution of symptoms.² In a long-term follow up study, 50% to 90% of patients had pain relief after conservative therapy.³ A multidisciplinary approach is successful for management of TMDs. Initial treatment goals should focus on resolving pain and dysfunction. Surgical interventions were reserved

for patients whose symptoms did not improve after a trial of conservative therapy.

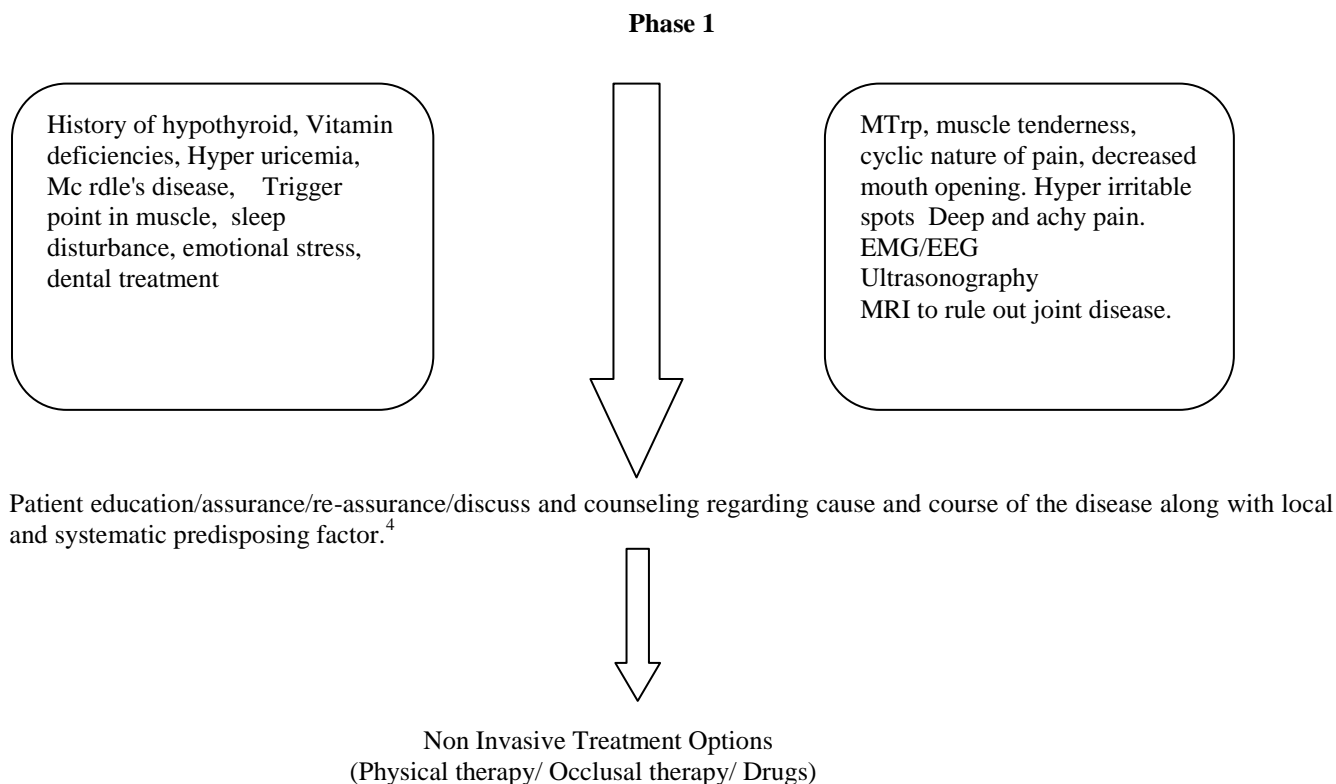
TREATMENT

The treatment of temporomandibular disorders can be divided into 3 broad categories: noninvasive, minimally invasive, and invasive management. The specific management plan can vary depending on the specific diagnosis and severity of TMD.

Goals of treatment

1. Decreasing joint pain
2. Increasing joint function and opening
3. Preventing further joint damage
4. Improving overall quality of life and reducing disease-related morbidities

NONINVASIVE TREATMENT OPTIONS



Physical Therapy

Physical therapy is commonly used in the outpatient setting to relieve musculoskeletal pain, reduce inflammation, and restore oral motor function. Physical therapy plays an adjunctive role in virtually all TMJ disorders treatment regimens. Various physical therapy modalities are available to the outpatient health provider (Table 1).⁵

Table 1: Description of treatment modalities

Modality	Description
Exercise therapy	Technique include manual therapy, postural exercise, muscle stretching, and strengthening exercise. ⁶ Passive and active stretching of muscles or range-of-motion exercise are performed to increase oral opening and decrease pain. ⁶
Thermal therapy	It involves the superficial application of a dry or moist heat/cold pad directly to the affected area typically in 20-min intervals. it is used in conjunction with exercise therapy in the treatment of inflammation and TMJ hypomobility.
Acupuncture	It 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. Treatment involves the placement of needles in the face and hands and are typically given weekly for a total of 6 weeks.

Occlusal or Stabilization Splints

The use of occlusal splints is thought to alleviate or prevent degenerative forces placed on the TMJ, articular disk, and dentition. These devices may benefit a select population of patients with severe bruxism and nocturnal clenching. There are varying designs (Table 2), all of which function similarly to disengage the condylar head from the fossa and articular disk.⁵

Pharmacotherapy (Drugs)

Pharmacologic therapy in conjunction with other treatment modalities often play an important role in the management of TMD. The aim of pharmacotherapy can be divided into 2 main goals.⁷

1. Treatment of underlying disease process
2. Alleviation of disease associated symptoms, such as pain and swelling

There are various classes of medications that function to target each of the 2 treatment goals (**Table 3**).⁸

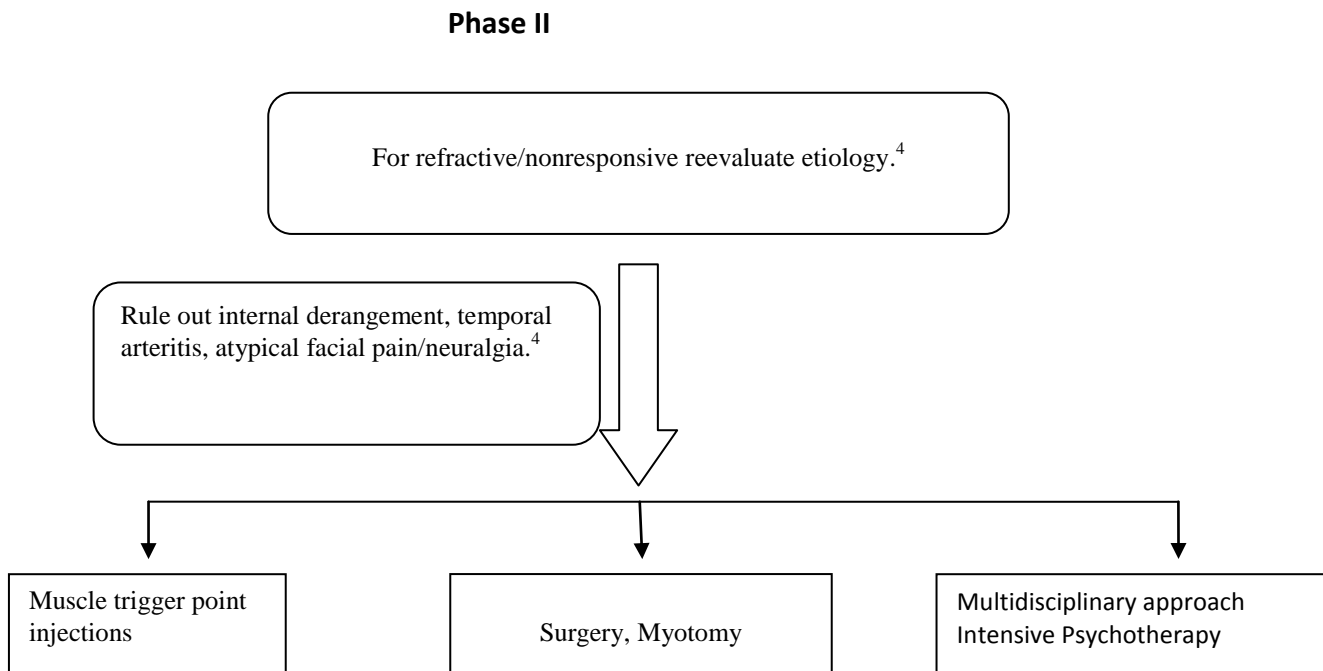
Table 2: Major types of occlusal splints used in TMD therapy

Splint type	Design
Stabilization splint	Hard acrylic with full coverage of maxillary and mandibular dentition in centric occlusion.
Repositioning splint	Hard acrylic with full coverage of maxillary or mandibular dentition with inclines to guide mandible to a more anterior position
Soft splint	Similar to hard stabilization splints but made from a more inexpensive pliable material.

Table 3: Types of medication used in TMD treatment

Class	Example
NSAIDs	Ibuprofen, naproxen, diclofenac, aspirin, etodolac
Opioids	Codeine, oxycodone, morphine, hydromorphone, meperidine
Corticosteroids	Prednisone, dexamethasone, hydrocortisone
Muscle relaxants	Cyclobenzaprine, carisoprodol, baclofen
Antidepressants	Amitriptyline, trazodone, fluoxetine, sertraline
Anxiolytics	Alprazolam, lorazepam, oxazepam, diazepam, buspirone

MINIMALLY INVASIVE TREATMENT OPTIONS



Intra-articular Injections

Intra-articular injections of the TMJ with local anesthetics or corticosteroids can be used for treatment of inflammation within the TMJ capsule.⁹ Intra-articular injection should only be used for severe acute exacerbations or after conservative therapies have been unsuccessful.⁹ Repeated intra-articular corticosteroid injections are not recommended. Local anesthetics and botulinum toxin (Botox) can also be used in trigger-point injection for treatment of chronic bruxism.^{9,10,11} Different therapeutic solutions can be injected directly into TMJ space and allow for the targeted treatment of inflammation and joint degeneration. (Table 4)¹²

Table 4: Types of intra-articular injections used in treatment of TMD

Hyaluronic Acid	A natural component of TMJ synovial fluid and lubricates and maintains the normal internal environment of the joints. ¹³
Corticosteroids	Reduction of inflammatory factors and reducing the activity of the immune system. ⁵

Arthrocentesis/Arthroscopy

Arthrocentesis and arthroscopy are safe and quick minimally invasive procedure that are used in patients who are resistant to more conservative treatment modalities (Table 5).

Table 5: Arthrocentesis and arthroscopy for TMD treatment

Arthrocentesis	<ul style="list-style-type: none"> • Procedure involves the insertion of small needles into the joint so that fluid can be irrigated through the joint to remove debris and inflammatory by products. • Recently reported 83.5% treatment success rate in patients with internal derangement and osteoarthritis.¹⁴
Arthroscopy	<ul style="list-style-type: none"> • Involves insertion of an arthroscope and inspection of the TMJ under fluid distention under general anesthesia, which allows mobilization of the joint under direct visualization.¹⁵ • More than 90% success rate as defined as improved mobility, pain and function.¹⁶

INVASIVE TREATMENT OPTIONS

Arthroplasty

Open-joint arthroplasty is surgery to repair, reposition, replace, or remove parts in joint. This usually involves the articular discs that cushions the jaw joint. During open-joint arthroplasty of the jaw, an incision is made in the skin to expose the jaw joint. Procedure is done under general anesthesia. Complications are rare but include wound infection, facial nerve injury, permanent occlusal changes, relapsing joint pain, and life-threatening vascular injuries.¹⁷

Total Joint Replacement

The need for TMJ replacement typically indicates severely damaged joints with end-stage disease that has failed all other more conservative treatment modalities.⁵ The primary function of joint replacement surgery is to relieve pain and restore function, which includes transmitting physiological loads and the provision of both a physiological range of movement and an articulation with minimum friction and wear. It has been demonstrated that the use of appropriate biomaterials and design parameters can decrease material wear and increase longevity of TMJ replacement devices.¹⁸ (Table 6)

Table 6: Biomaterials for application in TMJ

Autogenous costochondral bone grafts	Have been frequently used in TMJ reconstruction in the past because of its gross anatomic similarity to the mandibular condyle, ease of adaption to the recipient site, and its demonstrated growth potential in juveniles. ¹⁹
Titanium joint design	Currently, various custom and stock titanium joint designs are available, which consist of both a fossa and a condylar component held in place by screw fixation. ⁵

Conclusion

Temporomandibular disorders should be treated with multidisciplinary approach as other musculoskeletal complaints. If TMD is left untreated, symptoms can worsen and extend far beyond the jaw and mouth area. Conservative therapy is best as a first-line approach for treating the patient. Appropriate referral to pain management services should be considered rather than clutching at surgical options. Treatment goals in patient with TMD are pain relief and return of function. These goals will be achieved only if TMDs are diagnosed properly and treatment plan is taken with consideration of mental and physical problem with predisposing factors.

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