

Temporomandibular Disorders and their Management

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Abstract: TMD commonly used term for temporomandibular joint and muscle disorders are a group of conditions that cause pain and dysfunction in the tempoomandibular joint and the muscles that control jaw movement. Temporomandibular joint disorder since a clinical entity with diverse etiologies and symptoms, thus much of the difficulty is encountered in the treatment of TMD. Therefore through this paper emphasis is made on the diagnosis of temporomandibular disorders and their management which form the basis for a rational approach to therapy.

Keywords: Temporomandibular Disorders, Articular Disc, TMJ Dislocation

1. Introduction

Temporomandibular disorders embrace a wide spectrum of specific and non-specific disorders that produce symptoms of pain and dysfunction of the muscles of mastication and temporomandibular joints. Temporomandibular Joint Dysfunction is applied in a more restricted sense to smaller cluster of related, relatively non-specific disorders of TMJ and muscles of mastication that have many symptoms in common. Therefore through this paper emphasis is made on the diagnosis of temporomandibular disorders and their management which form the basis for a rational approach to therapy.

2. Developmental

The embryonic development of TMJ is frequently disturbed, leading to many kinds of abnormalities. Common growth disturbances of the bones are agenesis (no growth), hypoplasia (insufficient growth), hyperplasia (too much growth) or neoplasia (uncontrolled, destructive growth).

2.1. Etiology

Its etiology includes: Trauma affecting condylar head, Genetic determination, Disease of adjacent structures, such as middle ear. It is not completely understood. It can be due to

trauma may be a contributing factor especially in young joint, can lead to hypoplasia of the condyle resulting in asymmetric shift or growth pattern. This ultimately causes an asymmetric shift of the mandible with an associated malocclusion. Trauma can cause hyperplastic reaction resulting in overgrowth of bone commonly seen at the site of old fracture. Some hypoplastic and hyperplastic activities relate to inherent growth activities and hormonal body imbalances (e.g. acromegaly).

2.2. Clinical Characteristics

It includes Clinical asymmetry and pain is secondary to structural changes.

2.3. Definitive Treatment

It must be tailored specifically to the patients condition. Generally treatment is provided to restore function while minimizing any trauma to associated structures.

2.4. Supportive Therapy

Since most bone growth disorders are not associated with pain or dysfunction, supportive therapy is not indicated. If pain or dysfunction arises, then treatment is rendered according to the problem identified.

3. Deviation of Form

Etiology: It is caused by actual changes in the shape of articular surfaces i.e. either condyle, fossa and / or the disc. Alterations in form of bony surface may be a flattening of the condyle or fossa or even a bony protuberance on the condyle. Changes in the form of the disc include both thinning of the borders and perforations.

3.1. Clinical Characteristics

Most deviations in form cause dysfunction at a particular point of movement when a click or deviation in opening is noted, it will always occur at the same position of opening and closing. It may / may not be painful.

3.2. Definitive Treatment

The definitive approach is to return the altered structure to normal form which is often accomplished by a surgical procedure. In case of bony incompatibility the structures are smoothed and recorded. If the disc is perforated or misshaped, it is repaired (discoplasty). Since surgery is a relatively aggressive procedure it should be considered only when pain and dysfunction are unmanageable. Most deviations in form can be managed by supportive therapies.

3.3. Supportive Therapy

The patient should be encouraged, when possible, to learn a manner of opening and chewing that avoids or minimizes the dysfunction. Also In case of increased interarticular pressure associated with bruxism/muscle relaxation appliance is indicated to decrease muscle hyperactivity. And if pain is associated, analgesics may be necessary to prevent development of secondary central excretory effects.

4. Disc Displacement

Rotational and sideways displacements of the disk are most typically found with the mouth closed, rotational disc displacement is characterized by an anterior, and medial or lateral position of the disc with respect to an ideal position between condyle and the eminence. The sideways displacement consists of either a medial or lateral displacement.

Etiology: It results from elongation of the capsular and discal ligaments coupled with thinning of the articular disc which commonly results from macro/microtrauma. The other causes are orthopedic instability plus joint loading.

4.1. Clinical Characteristics

Clinical examination reveals a relatively normal, range of movement with restriction only associated with the pain. Discal movement can be felt by palpation of the joints during opening and closing. Deviations in the opening pathway are common.

4.2. Definitive Treatment

Definitive approach is to reestablish a normal condyle-disc relationship. The treatment goal is to reduce intracapsular pain and not to recapture the disc.

A muscle relaxation appliance should be used whenever possible because adverse long term effects are minimal. When this appliance is not effective, an anterior repositioning appliance should be fabricated. The patient should be initially instructed to wear the appliance always at night during sleep and during the day when needed to reduce symptoms. This part time use will minimize adverse occlusal changes. As symptoms resolve the patient is encouraged to decrease the use of the appliance. These adaptive changes can take 8 to 10 weeks or even longer. After elimination of the appliance if symptoms return and orthopedic stability is present, dental therapy to correct this condition is indicated.

4.3. Supportive Therapy

The patient should be educated to the mechanics of the disorder and the adaptive process that is essential for treatment. Softer foods, slower chewing, smaller bites should be promoted. If inflammation is suspected, NSAID's should be prescribed moist heat or ice can be used if the patient finds either helpful. Passive jaw movements may be helpful and on occasion destructive manipulation by a physical therapist may assist in healing.

4.4. Arthrocentesis

This is the most conservative surgical procedures. Two needles are placed into the joint and sterile saline solution is passed through lavaging the joint. The lavage is thought to eliminate much of the algogenic substances and breakdown by products that produce the pain.

4.5. Pumping the Joint

In cases of disc dislocation without reduction a single needle can be introduced to the joint and fluid can be forced into the space in an attempt to free the articular surfaces.

4.6. Arthroscopy

An arthroscopy is placed into the superior joint space and the intercapsular structures are visualized on a monitor. This procedure appears to be very successful in reducing symptoms and improving movement. It helps in improving disc mobility.

4.7. Arthrotomy

It is a open joint surgery. A variety of arthrotomy procedures can be performed when disc is displaced or dislocated, the surgical procedure of choice is plication during which a portion of the retrodiscal tissue and inferior lamina is removed and the disc is retracted posteriorly and secured with sutures.

4.8. Disectomy

When disc is damaged and can no longer be maintained for use in the joint the disc is removed. It leaves a bone to bone articulation which is likely to produce some osteoarthritic changes. Another choice is to remove the disc and replace it with a substitute – Discal implants which include medical silastic, proplast-Teflon, Dermal and auricular cartilage grafts.

5. Hypermobility

Hypermobility does not necessarily represent a pathologic condition. The term hyper mobility implies there is radiographic or clinical evidence that the mid axis of the mandibular condyle is translating beyond the peak of the articular eminence.

It is also preferred to as subluxation. Clinical observations of affected joints reveal that as the mouth opens to its fullest extent a momentary pause occurs, followed by a sudden jump or leap to maximally open position. The jump does not produce a clicking sound but instead is accompanied by more of a thud. During maximum opening the lateral poles of the condyles will jump forward, causing a noticeable preauricular depression. Subluxation is more likely to occur in a TMJ whose articular eminence has a short setup posterior shape followed by a longer flatter anterior slope. During opening the steep eminence requires a significant amount of discal rotation to occur before the condyle reaches the crest. As the condyle reaches the crest, the disc rotates on the condyle to the posteriorly maximum degree allowed by the anterior capsular ligament. In subluxating joint maximum rotational movement of the disc is reached before the maximum translation of the condyle. Therefore as the mouth opens wider the last portion of the translatory movement occurs with a bodily shift of the condyle and disc as a unit. This is abnormal and it creates a quick forward leap and thud of the condyle disc complex.

5.1. Definitive Treatment

It involves the surgical alteration of the joint.

5.2. Eminectomy

It reduces the steepness of the articular eminence and thus reduces the amount of posterior rotation of the disc on the condyle during full translation.

5.3. Supportive Therapy

The patient must learn to restrict opening so as not to reach the point of translation that initiates the interference. On occasion, when the interference cannot be voluntarily resolved, an intraoral device to restrict movement is employed. Wearing the device develops a myostatic contracture of the elevator muscles, thus limiting opening to the point of subluxation. The device is worn for 2 months and removed, allowing the contracture to limit the opening.

6. Dislocation

This is commonly referred to as an open-lock.

6.1. Etiology

When the mouth opens to its fullest extent, the condyle is translated to its anterior limit. In this position the disc is rotated to its most posterior extent on the condyle. If the condyle moves beyond this limit, the disc can be forced thorough the disc space and trapped in this anterior position as the disc space collapses as a result of the condyle moving superiorly against the articular eminence. This same spontaneous dislocation can also occur if the superior lateral pterygoid contracts during the full limit of translation pulling the disc through the anterior disc space. When a spontaneous dislocation occurs the superior retrodiscal lamina cannot retract the disc space. Spontaneous reduction is further aggravated when the elevator muscles contract, since this activity increases the interarticular pressure and further decreases the disc space. The reduction becomes even more unlikely when the superior/ inferior lateral pterygoid experiences myopasms, which pull the disc and condyle forward.

6.2. Clinical Characteristics

The patient remains in a wide open mouth condition. Pain is commonly present secondary to the patients attempts to close the mouth.

6.3. Definitive Treatment

Definitive treatment is directed toward increasing the disc space, which allows the superior retrodiscal lamina to retract the disc. When attempts are being made to reduce the dislocation the patient must open wide as if yawning. This will activate the mandibular depressors and inhibit the elevators. At the same time slight posterior pressure applied to the chin will sometimes reduce a spontaneous dislocation. If this is not successful, the thumb placed on the mandibular molars and downward pressure is exerted as the patient yawns. This will usually provide enough space to recapture normal disc position.

When spontaneous dislocation becomes chronic or recurrent, definitive treatment may consist of surgical procedure directed toward correcting the structures that contribute to the disorder.

6.4. Supportive Therapy

Most effective method is prevention. When spontaneous dislocation is recurrent the patient is taught the reduction. Chronic recurrent dislocations is treated by surgical procedure.

7. Inflammatory Disorders

They are generally characterized by continuous joint area pain, often accentuated by function. Since the pain is

constant, it can also result in secondary central excitatory effects such as cyclic muscle pain, hyperalgesia and referred pain.

The four categories are: Synovitis., Capsulitis., Retrodiscitis. And Arthritides.

7.1. Synovitis and Capsulitis

These both can be distinguished only by visualizing the tissues through arthroscopy or arthrotomy.

7.2. Etiology

It occurs due to Trauma of Macro and Micro infection from adjacent structures.

7.3. Clinical Characteristics

Any movement that tends to elongate the capsular ligament will accentuate the pain which is reported to be directly in front of the ear and the lateral aspect of the condyle is usually tender to palpation.

7.4. Definitive Treatment

Since the etiology is self limiting there is no definitive treatment indicated when recurrence of trauma is likely, efforts are made to protect the joint from any further injury.

7.5. Supportive Therapy

The patient is instructed to restrict all mandibular movements within painless limits-soft diet, slow movements and small bites are necessary. Patients with constant pain should receive mild analgesics. Moist heat 4-5 times a day for 10-15 minutes. Ultrasound therapy – 2-4 times / week. Single injection of corticosteroid to the capsular tissues. Repeated injections are contraindicated.

8. Retrodiscitis

It is a inflammatory condition of retrodiscal tissues. It is a common intracapsular disorder.

8.1. Etiology

It occurs due to Trauma caused by Extrinsic and Intrinsic.

Extrinsic: Created by a sudden movement of the condyle into the retrodiscal tissues. These tissues often respond to this type of trauma with inflammation which leads to swelling and on occasion trauma to the retrodiscal tissues cause intercapsular hemarthrosis.

Intrinsic trauma: Occurs when an anterior functional displacement or dislocation of the disc is present.

8.2. Clinical Characteristics

- Constant periauricular pain that is accentuated with jaw movement.
- Cleansing the teeth, increases the pain.
- If the tissues swell a loss of posterior occlusal contact can occur on the ipsilateral side.

8.3. Definitive Treatment from Extrinsic Trauma

Since etiologic factor of trauma is generally no longer present there is no definitive treatment. When trauma is likely to occur, care must be taken to protect the joint.

8.4. Supportive Therapy for Retrodiscitis from Extrinsic Trauma

If no evidence of acute malocclusion is found, the patient is given analgesics for pain and instructed to restrict movement to within painless limits and begin a soft diet. To decrease the likelihood of ankylosis, movement is encouraged. Ultrasound and chemotherapy are often helpful in reducing pain. If pain persists, a single intracapsular injection of corticosteroids may be used in isolated cases of trauma, but repeated injections are contraindicated. A muscle relaxation appliance should be fabricated to stabilize the occlusal condition and eliminate further loading of the retrodiscal tissues. On occasion when acute malocclusion results from extrinsic trauma, intermaxillary fixation may be indicated to reestablish the proper occlusal conditions. If intermaxillary fixation is used, the mandible should be freed at least twice a day for at least 10 minutes of movement.

8.5. Definitive Treatment for Retrodiscitis from Intrinsic Trauma

Definitive treatment is directed towards eliminating traumatic condition. An anterior repositioning appliance is used to reposition the condyle off the retrodiscal tissues and onto the disc.

8.6. Supportive Therapy for Retrodiscitis from Intrinsic Trauma

Supportive therapy begins with voluntary restricting use of the mandible to within painless limits. Analgesics are prescribed when pain is not resolved with repositioning appliance. Thermotherapy and ultrasound can be helpful in controlling symptoms. Since the inflammatory condition is often chronic intraarticular injection of corticosteroids is generally not indicated.

9. Arthritis

Arthritis means inflammation of the articular surfaces of the joint. The different types are: Osteoarthritis, Osteoarthrosis, Polyarthritides, Osteoarthritis. These are the most common arthritides. They are also referred to as degenerative joint disease.

9.1. Etiology

Overloading of the articular structures of the joint. This may occur when joint surfaces are compromised by disc dislocation and retrodiscitis.

9.2. Clinical Characteristics

Limited mandibular opening is characterized because of joint pain.. A soft end feel is common unless the osteoarthritis is associated with an anteriorly displaced disc. Crepitation can be typically felt. Lateral palpation of the condyle increases the pain as does manual loading of the joint. The patient may have symptoms for as long as 6 months before there is enough demineralization of bone to show up radio graphically.

9.3. Definitive Treatment

The mechanical loading should be decreased. The condyle-disc relationship, anterior repositioning appliance therapy should be used. When muscle hyperactivity is suspected, a muscle relaxation appliance is indicated. Any oral habits that create pain in the joint must be identified and discouraged.

9.4. Supportive Therapy

It begins with an explanation of the disease process to the patient. Along with the fabrication of an appliance in a comfortable mandibular position. Pain medication and inflammatory agents are prescribed to decrease the general inflammatory response. A soft diet is instituted. Thermotherapy is usually helpful in reducing symptoms.

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