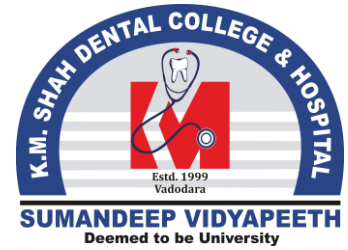

BDS Year 4 Regular & Casual batch
Academic Year 2023-2024
Subject: Oral Medicine and Radiology
Topic: TMJ Disorders Part 2

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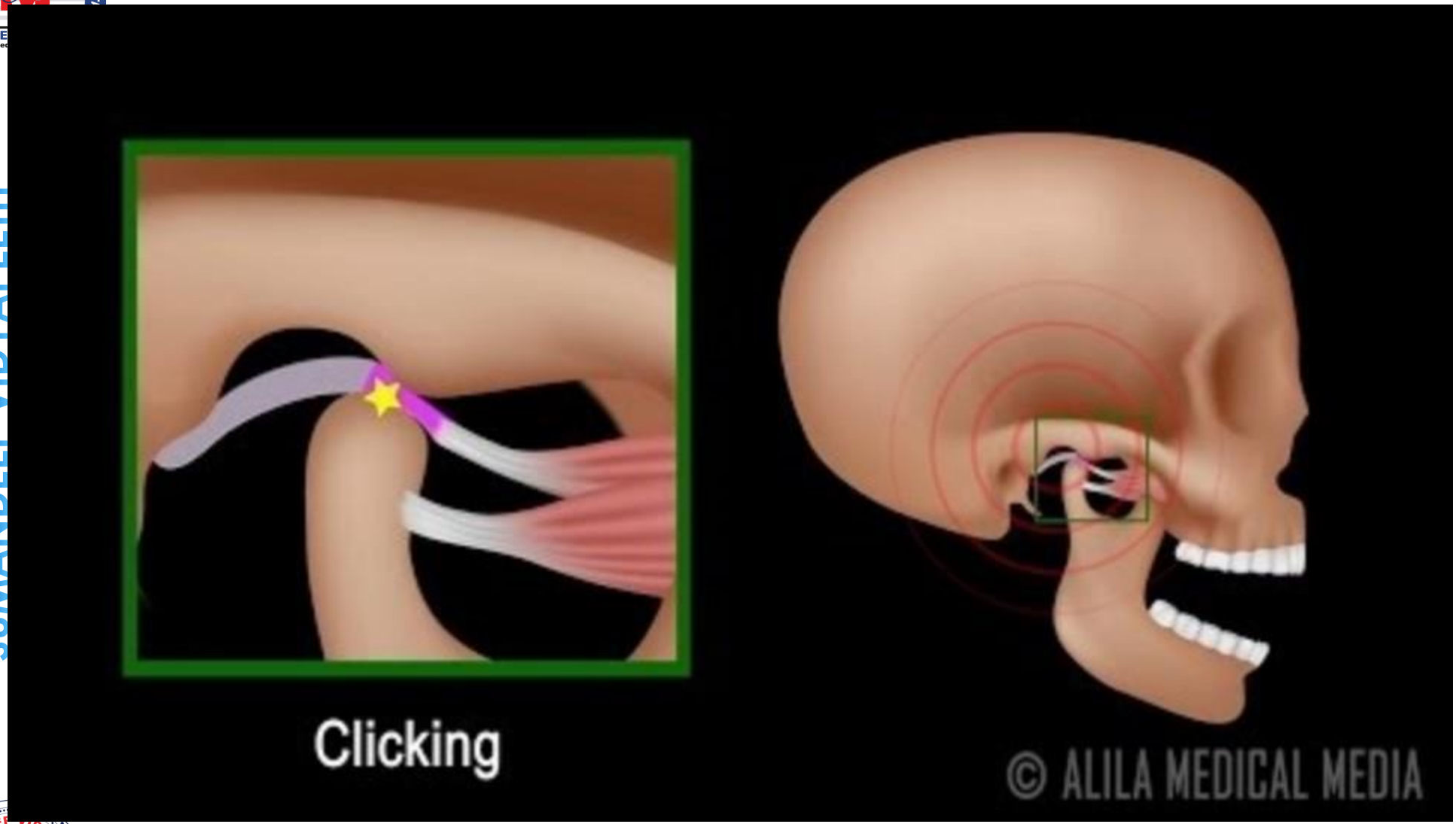


CLASSIFICATION OF TMJ DISORDERS

I. Classification by Weldon Bell in 1986

- Masticatory muscle disorders
  - Protective muscle splinting
  - Masticatory muscle spasm (MPS)
  - Masticatory muscle inflammation – myositis

- Derangement of TMJ
  - In coordination
  - Anterior disc displacement with reduction (clicking)
  - Anterior disc displacement without reduction (mechanical restriction, closed lock)

- Extrinsic Trauma
  - Traumatic arthritis
  - Dislocation
  - Fracture
  - Internal disc derangement
  - Myositis
  - Myospasm
  - Tendonitis
- Degenerative joint disease
  - Non-inflammatory phase, arthrosis
  - Inflammatory phase – osteoarthritis

- Inflammatory joint disorders
  - Rheumatoid arthritis
  - Infective arthritis
  - Metabolic arthritis
- Chronic mandibular Hypomobility
  - Ankylosis – fibrous & osseous
  - Fibrosis of articular capsule
  - Contracture of elevator muscles
  - Myostatic contracture
  - Myofibrotic contracture
- Growth Disorders of the joint
  - Developmental disorders
  - Acquired disorders
  - Neoplastic disorders

Clark GT et al in 1989

A. Disorders of the condyle

a. Developmental

- Agenesis
- Hyperplasia
- Hypoplasia

b. Traumatic

- Fracture
- Ankylosis

c. Neoplastic

- Benign
- Malignant

B. Disorders of the meniscus (disc)

a. Displacement

- **With reduction**
- **Without reduction**

b. Disorders of the synovial apparatus

a. Acute inflammation

b. Chronic inflammation

- **Rheumatoid arthritis**
- **Psoriatic arthritis**

c. Ankylosing spondylitis

d. Suppurative arthritis

- **Gout**

Dworkin and Le Resche in 1992

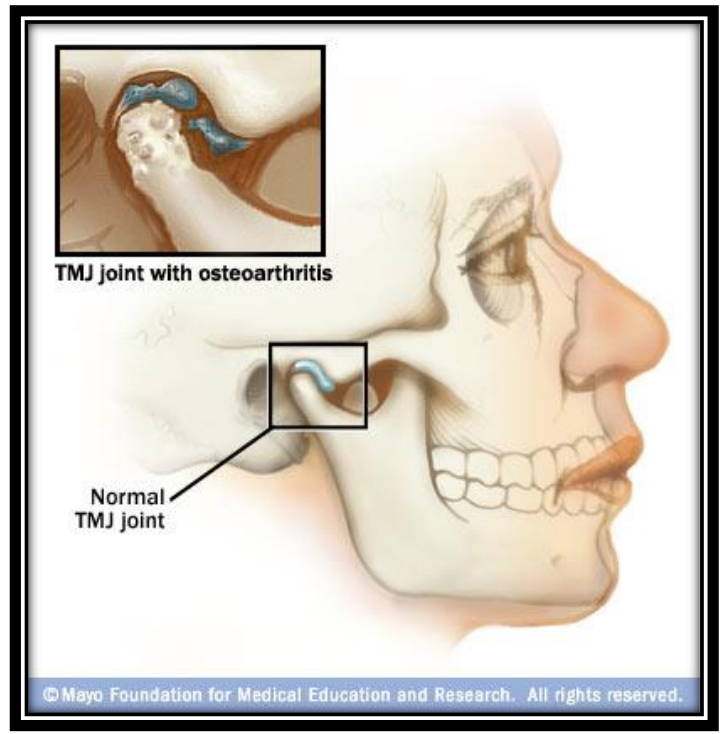
A. Group I: Muscle disorders
   a. Myofascial pain
   b. Myofascial pain with limitations in aperture
B. Group II: Disc displacement
   a. Disc displacement with reduction
   b. Disc displacement without reduction and no limitations in aperture
   c. Disc displacement without reduction and with limitations in aperture
C. Group III: Arthralgia, arthritis, arthrosis
   a. Arthralgia
   b. Osteoarthritis of the TMJ
   c. Osteoarthrosis of the TMJ

Inflammatory disorders

- **OSTEOARTHRITIS –**
  - **Etiology**
    - **Trauma (acute or chronic)**
    - **Infection**
    - **Metabolic disturbances**

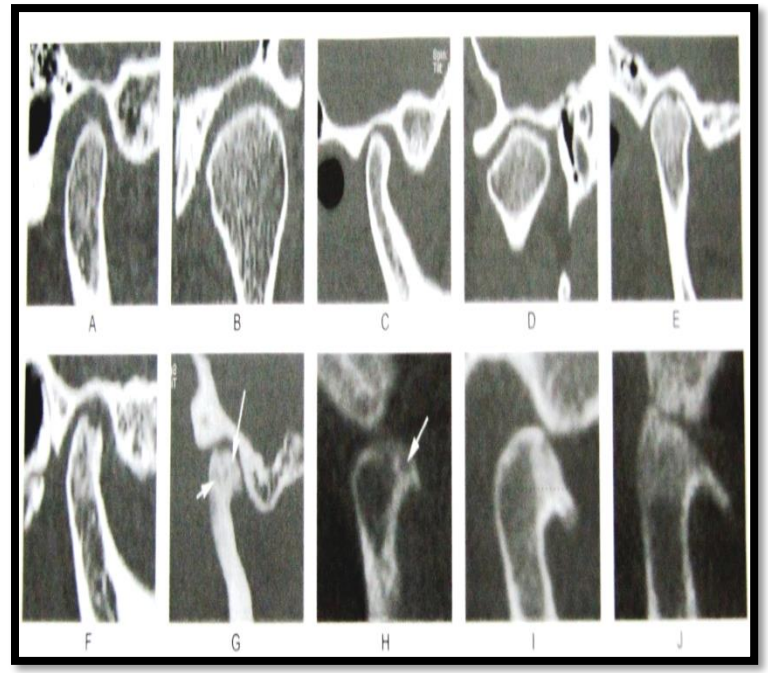
Clinical Features

- Age > 20 years.
- Pain on moving the mandible
- Limited motion
- Deviation of the jaw to the affected side.
- Joint sounds are described as grating, grinding, or crunching, but not as clicking or popping.



Radiological Features

- Degenerative changes like narrowing of the joint space
- Flattening of the articular surfaces
- Osteophytic formation
- Anterior lipping of the condyle and the presence of Ely's cyst



Computed tomographic findings of normal and osteoarthritic temporomandibular joints.

Treatment

- Conservative treatment.
- Conservative therapy includes NSAID's, heat, soft diet, rest and occlusal splints that allow free movement of the mandible.
- In the acute phase, patients may require intra-articular injection of a long-acting corticosteroid such as beclomethasone or hyaluronic acid are limited to two or three injections separated by 4 to 6 weeks.
- Surgery may be indicated to remove the loose fragments of bone (so-called joint mice) and reshape the condyle.

RHEUMATOID ARTHRITIS

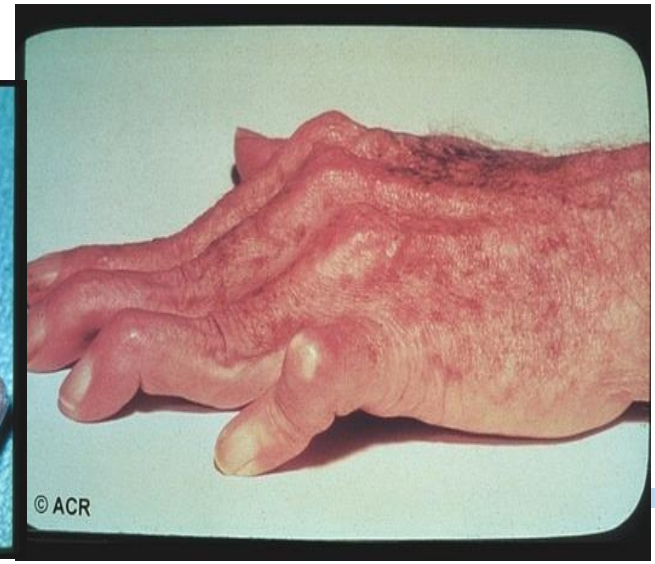
- Rheumatoid arthritis was first described clinically in 1800 in a doctoral thesis by Landre-Beauvais, a French medical student, who called the condition "primary aesthenic gout."
- Sir Alfred Garrod established the distinction between RA and gout in 1859 and gave the condition its present name.

Pathophysiology

- Etiology appears to be multifactorial and may involve infectious, genetic, endocrine and immunological causes.
- It is believed to be a T lymphocyte–driven disease in which a sudden influx of T cells into the affected joints is followed by an increased number of macrophages and fibroblasts, drawn by the release of cytokines, particularly interleukin-1, or IL-1, and tumor necrosis factor alpha, or TNF-α.
- This cytokine release and subsequent migration of cells is thought to be responsible for the chronic inflammation, and characteristic destructive changes in rheumatoid joints.

Clinical features

- Extra-Articular Manifestations
- Rheumatoid nodule
- Hematological
- Skin
- Vasculitis
- Neurological
- Fever
- Lymphadenopathy
- Carditis



Clinical Features

- TMJ Related
- Bilateral stiffness
- Deep seated pain
- Tenderness on palpation and opening and inability to perform lateral excursions
- Anterior open bite is present due to bilateral destruction and antero-posterior positioning of the condyle.
- Fibrous ankylosis of the joint which may be partial or complex

Radiological Features

- The pannus may destroy the disc and due to this, the joint space is reduced.
- Flattening of the head of the condyle.
- Erosion of the condyle
- In advanced stages, erosion of anterior and posterior condylar surface at the attachment of the synovial lining occurs, which may resemble a 'sharpened pencil'.

Treatment

- Soft diet
- Intra-articular corticosteroid injections such as methyl prednisolone acetate 20-80 mg for large joint and 4 to 10 mg for small joint or triamcinolone hexa-acetomide 10-40 mg for large joint and 2 to 6 mg for small joint are given.
- Nonsteroidal antiinflammatory drugs - these drugs are inhibitory to prostaglandins.
- Local treatment is done with heat, diathermy, jaw exercise or a mouth stretcher.
- Muscle strengthening exercise

JUVENILE RHEUMATOID ARTHRITIS

- TMJ arthritis in children with chronic arthritis was first reported by Still in his initial case series in 1897.
- It is also called as Still's disease and juvenile polyarthritis.
- It is defined as a chronic synovitis with or without extra-articular manifestations, but it is accompanied by more systemic features than for adults

Clinical Features

- Occurs in children – 1 to 3 years.
- Joints involved are bilateral
- Polyarthritis of both small and large joints including the cervical spine.
- Neck pain and a limited range of movement
- Restricted opening of the mouth.
- It may cause interference with normal condylar growth, leading to micrognathia.
- Facial Appearance- Bird face
- Splenomegaly, lymphadenopathy, leuko-cytosis, pyrexia and rash

Radiographic feature

- Osteopenia
- Deepening of the antegonial notch
- Diminished height of the ramus
- Pencil shaped condyle

ANKYLOSIS OF THE TMJ

- Ankylosis - 'stiff joint'.
- Ankylosis is defined as loss of joint movement resulting from fusion of bones within the joint or calcification of the ligaments around it.

Classification Of Ankylosis

- False ankylosis or true ankylosis.
- Extra-articular or intra-articular.
- Fibrous or bony.
- Unilateral or bilateral.
- Partial or complete

Etiology

- **Trauma**
  - At birth (with forceps)
  - Blow to the chin (causing *haemarthrosis*)
  - Condylar fracture

- **Infections and Inflammatory**
  - Rheumatoid Arthritis
  - Septic arthritis
  - Otitis media
  - Mastoditis
  - Parotitis
  - Osteomyelitis
  - Osteoarthritis
  - Tonsillitis

- **Systemic disease**
  - Small pox
  - Ankylosing spondylitis
  - Syphilis
  - Typhoid fever
  - Scarlet fever

- **Others**
  - Malignancies
  - Post radiology
  - Post surgery
  - Prolonged trismus

TRAUMA

↓

Extravasation of blood into the joint space

↓

haemarthrosis

↓

Calcification and obliteration of the joint space

↓

Intra-capsular ankylosis **Extra-capsular ankylosis**

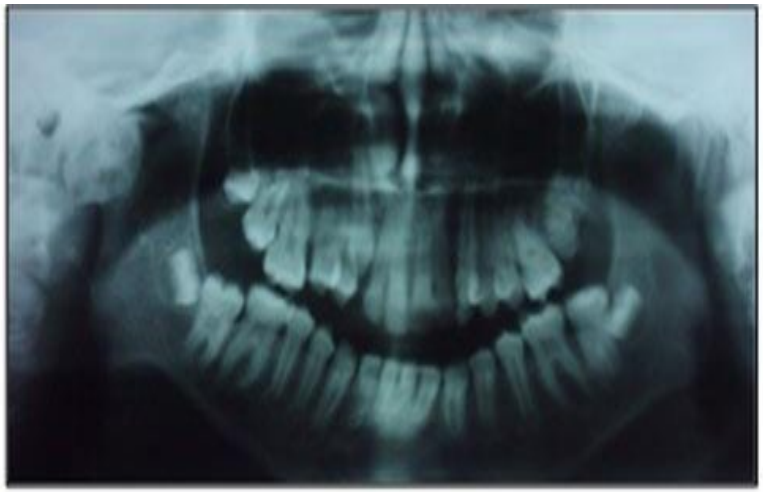
Clinical Features

- Unilateral Ankylosis
- Seen in a child or in a person where the onset was usually in the childhood.
- Facial asymmetry.
- Deviation of the mandible and chin on the affected side.
- The lower border of the mandible on the affected side has a concavity that ends in a well-defined ante-gonial notch.
- In unilateral ankylosis some amount of oral opening may be possible.
- Cross bite may be seen.
- Class II angles malocclusion on the affected side plus unilateral posterior cross bite on the ipsilateral side seen.
- Condylar movements are absent on the affected side.

- Bilateral Ankylosis
- Inability to open the mouth progresses by gradual decrease in interincisal opening.
- The mandible is symmetrical but micrognathic.
- The patient develops typical 'bird face' deformity with receding chin.
- The neck chin angle may be reduced or almost completely absent.
- Antegonial notch is well-defined bilaterally.
- Class II malocclusion can be noticed.

Radiographic features

- In Fibrous Ankylosis reduced joint space and hazy appearance can be seen.
- In Bony Ankylosis complete obliteration of joint space is seen
- Deformed condylar head or complete bony consolidation replacing the joint space can be seen.
- Elongation of the coronoid process on the side of hypomobility will be seen.
- Deepening of the antegonial notch



OPG of the patient showing right TMJ ankylosis.

•Intra-capsular ankylosis

- There's destruction of the meniscus and flattening of the temporal fossa
- thickening and flattening of the condylar head and a narrowing of the joint space.
- Opposing surfaces then develop fibrous adhesions that inhibit normal movements and finally, may become ossified.

Extra-capsular ankylosis

There's an external fibrous encapsulation with minimal destruction of the joint itself.

MANAGEMENT

- Non surgical management
- Surgical treatment

SURGICAL MANAGEMENT

Aims and Objectives of surgery

- To release ankylosed mass and creation of a gap to mobilize the joint
- Creation of functional joint (improve patient's oral hygiene, nutrition and good speech)
- To reconstruct the joint and restore the vertical height of the ramus
- To prevent re-occurrence
- To restore normal facial growth pattern
- To improve esthetic appearance of the face (cosmetic reason)
- Physiotherapy follow-up

SURGICAL MANAGEMENT.....

Procedures

1. Condylectomy
2. Gap arthroplasty
3. Interpositional arthroplasty

By American academy of orofacial pain

TABLE 10-2 Diagnostic Classification of Temporomandibular Disorders

Diagnostic Category	Diagnoses
Cranial bones (including the mandible)	Conganital and developmental disorders: aplasia, hypoplasia, hyperplasia, dysplasia (eg, 1st and 2nd branchial arch anomalies, hemifacial microsomia, Pierre Robin syndrome, Treacher Collins syndrome, condylar hyperplasia, prognathism, fibrous dysplasia) Acquired disorders (neoplasia, fracture)
Temporomandibular joint disorders	Deviation in form Disk displacement (with reduction; without reduction) Dislocation Inflammatory conditions (synovitis, capsulitis) Arthritidas (osteoarthritis, osteoarthrosis polyarthritides) Ankylosis (fibrous, bony) Neoplasia
Masticatory-muscle disorders	Myofascial pain Myositis Spasm Protective splinting Contracture

Masticatory muscle disorders

- Certainly the most frequent complaint given by patients with functional disturbances of the masticatory system is muscle pain (myalgia).
- Patients commonly report that the pain is associated with functional activities such as chewing, swallowing, and speaking. The pain is also aggravated by manual palpation or functional manipulation of the muscles.
- Restricted mandibular movement is common.
- Muscle pain is of extracapsular origin and may be primarily induced by the inhibitory effects of deep pain input.
- The restriction is most often not related to any structural change in the muscle itself. Sometimes accompanying these muscle symptoms is an acute malocclusion

- All masticatory muscle disorders are not clinically the same. At least five different types are known, and being able to distinguish among them is important because the treatment of each is quite different.
- The five types are

(1) protective co-contraction (muscle splinting)

(2) local muscle soreness

(3) myofascial (trigger point) pain

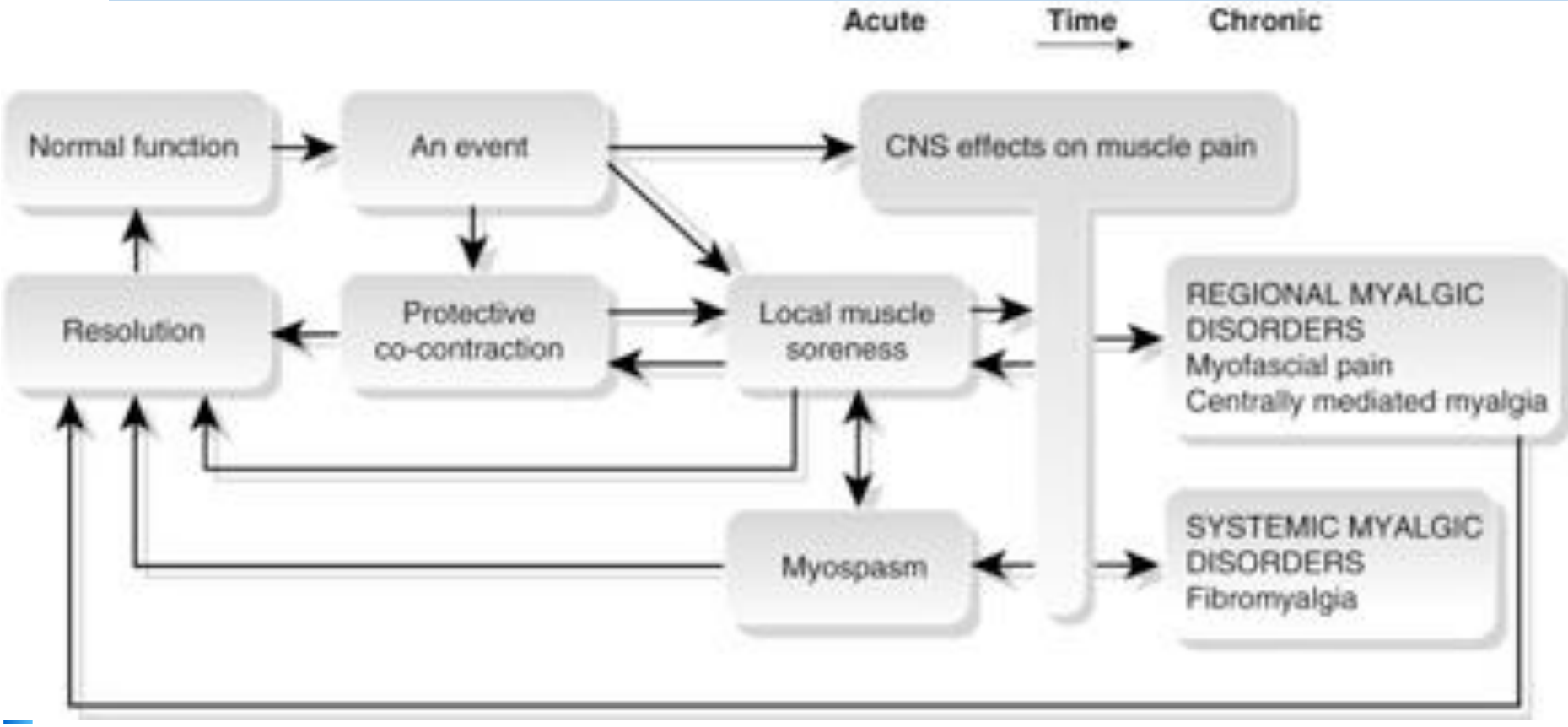
(4) myospasm

(5) centrally mediated myalgia.

- A sixth condition known as *fibromyalgia*
- Most of these masticatory muscle disorders occur and recover in a relatively short period of time, they are generally considered acute myalgic disorders.
- When these conditions are not resolved, more chronic pain disorders that are often more complicated to manage may result.
- Centrally mediated myalgia and fibromyalgia are examples of chronic myalgic disorders.

Protective Co-Contraction (Muscle Splinting)

- Protective co-contraction is a central nervous system (CNS) response to injury or threat of injury.
- In the past this response was referred to as *muscle splinting.*
- In the presence of an event, the activity of appropriate muscles seems to be altered so as to protect the injured part from further injury.
- When protective co-contraction occurs, the CNS increases the activity of the antagonist muscle during contraction of the agonist muscle
- A patient who is experiencing protective co-contraction will demonstrate a small increased amount of muscle activity in the elevator muscles during mouth opening.
- During closing of the mouth, increased activity is noted in the depressing muscles.
- This reflex-like activity is not a pathologic condition but a normal protective or guarding mechanism that needs to be identified and appreciated



This model depicts about the relationship among various clinically identifiable muscle pain disorders along with some etiologic considerations

Causes

1. Altered sensory or proprioceptive input

- Protective co-contraction may be initiated by any change in the occlusal condition that significantly alters sensory input, such as the introduction of a poorly fitting crown.
- If a crown is placed with a high occlusal contact, it tends to alter the sensory and proprioceptive input to the CNS.
- Consequently, the elevator muscles (temporalis, masseter, medial pterygoid) may become protectively cocontracted in an attempt to prevent the crown from contacting the opposing tooth

2. Constant deep pain input

- The presence of deep pain input felt in local structures can produce protective co-contraction of associated muscles
- It is important to note that the source of the deep pain need not be muscle tissue itself but can be any associated structure such as tendons, ligaments, joints, or even the teeth.

3. Increased emotional stress

- Clinical observations strongly demonstrate that emotional stress can greatly influence masticatory muscle activity.
- The clinical response of the muscle is seen as protective co-contraction
- Increased emotional stress also has the ability to initiate parafunctional activities such as nocturnal bruxism and clenching

Clinical characteristics

1. Structural dysfunction
2. No pain at rest
3. Increase pain with function
4. Feeling of muscle weakness

Definitive treatment

- Protective co-contraction is a normal CNS response and therefore there is no indication to treat the muscle condition itself.
- Treatment should instead be directed towards the reason for the co-contraction

Supportive therapy

- When the cause of protective co-contraction is tissue injury, supportive therapy is often the only type of treatment rendered.
- It begins with instructing the patient to restrict use of the mandible to within painless limits.
- A soft diet may be recommended until the pain subsides. Short-term pain medication (nonsteroidal antiinflammatory drugs [nsaids]) may be indicated.

LOCAL MUSCLE SORENESS (NONINFLAMMATORY MYALGIA)

- Local muscle soreness is a primary, noninflammatory, myogenous pain disorder. It is often the first response of the muscle tissue to continued protective co-contraction.
- Although co-contraction represents a CNS-induced muscle response, local muscle soreness represents a change in the local environment of the muscle tissues.
- It represents the initial response to overuse, which we think of as fatigue.

CAUSE

The following conditions lead to local muscle soreness:

1. Protracted protective co-contraction secondary to a recent alteration in local structures or a

continued source of constant deep pain

2. Local tissue trauma or unaccustomed use of the muscle
3. Increased levels of emotional stress

HISTORY

The history reported by a patient with local muscle soreness will include one of the following:

1. Pain began several hours/days following an event associated with protective co-contraction.
2. Pain began associated with tissue injury (injection, opening wide, or unaccustomed muscle use in which the pain may be delayed).
3. Pain began secondary to another source of deep pain.
4. There was a recent episode of increased emotional stress

CLINICAL CHARACTERISTICS

1. Structural dysfunction: marked decrease in the velocity and range of mandibular movement (full range of movement cannot be achieved by patient)
2. Minimum pain at rest
3. Pain increased with function
4. Actual muscle weakness present8
5. Local tenderness when the involved muscles are palpated

DEFINITIVE TREATMENT

The primary goal in treating local muscle soreness is to decrease sensory input (such as pain) to the CNS.

The following steps decrease sensory input:

1. Eliminate any ongoing altered sensory or proprioceptive input.
2. Eliminate any ongoing source of deep pain input (whether dental or other).
3. Provide patient education and information on self-management (PSR).

The following four areas should be emphasized:

a) Advise the patient to restrict mandibular use to within painless limits.

Any time that use of the mandible causes pain, co-contraction can be reestablished.

Therefore the patient should be instructed not to open to the point of pain. A soft diet should be encouraged, along with smaller bites and slower chewing.

b) The patient should be encouraged to use the jaw within the painless limits so that the proprioceptors and mechanoceptors in the musculoskeletal system are stimulated. This activity seems to encourage return to normal muscle function.

Therefore careful and deliberate use of the muscle can promote resolution of local muscle soreness

c) The patient should be encouraged to reduce any nonfunctional tooth contacts

The patient is instructed to keep the lips together and the teeth apart.

d) The patient should be made aware of the relationship between increased levels of emotional stress and the muscle pain condition.

When emotional stress appears to be a significant contributor to the local muscle soreness, techniques that reduce stress and promote relaxation should be encouraged

4. Although patients can often control daytime tooth contacts, most have little control over nocturnal tooth contacts.

When night time clenching or bruxing is suspected (early morning pain), it is appropriate to fabricate an occlusal appliance for night time use

MYOFASCIAL PAIN (TRIGGER POINT MYALGIA)

Myofascial pain is a regional myogenous pain condition characterized by local areas of firm, hypersensitive bands of muscle tissue known as *trigger points.*

This condition is also called *myofascial trigger point pain*.

The presence of central excitatory effects is common with this myalgic disorder.

The most common effect is referred pain, often described by the patient as a tension-type headache.

CAUSE

Although a complete understanding of this disorder is lacking, the following causes have been related to myofascial pain:

1. Continued source of deep pain input
2. Increased levels of emotional stress
3. Presence of sleep disturbances

4. Local factors that influence muscle activity such as habits, posture, muscle strains, or even

chilling

5. Systemic factors such as nutritional inadequacies, poor physical conditioning, fatigue,

and viral infections

6. Idiopathic trigger point mechanism

History

The patient's chief complaint is often the heterotopic pain and not the actual source of pain (the trigger points).

Therefore the patient will direct the clinician to the headache (tension-type) or

protective co-contraction.

CLINICAL CHARACTERISTICS

An individual suffering with myofascial pain will commonly reveal the following clinical characteristics:

1. Structural dysfunction: A slight decrease in the velocity and range of mandibular movement may exist depending on the location and intensity of the trigger points.

This mild structural dysfunction is secondary to the inhibitory effects of pain (protective co-contraction).

2. The heterotopic pain is felt even at rest.
3. Pain may increase pain with function.
4. When provoked, tight muscle bands with trigger points increase the heterotopic pain.

DEFINITIVE TREATMENT

The treatment of myofascial pain is directed toward the elimination or reduction of causes. The clinician can accomplish this with the following treatment protocol:

1. Eliminate any source of ongoing deep pain input in an appropriate manner according to the cause.

2. Reduce the local and systemic factors that contribute to myofascial pain

3. If a sleep disorder is suspected, proper evaluation and referral should be made. Often low
dosages of a tricyclic antidepressant, such as 10 to 20 mg of amitriptyline before bedtime,
can be helpful

4. One of the most important considerations in the management of myofascial pain is the treatment and elimination of the trigger points

- One of the most common and conservative methods of eliminating trigger points is with a spray-and-stretch technique.
- This technique consists of spraying a vapocoolant spray (e.g.,fluoromethane) on the tissue overlying the muscle with a trigger point and then actively stretching the muscle.
- The vapocoolant spray provides a burst of cutaneous nerve stimulation that temporarily reduces pain perception in the area .
- Once the tissue has been sprayed, the muscle is stretched to its full length painlessly
- The vapocoolant spray is applied from a distance of approximately 18 inches and in the direction of the referred symptoms.
- Importantly, the passive stretching of the muscle is performed without producing pain.
- If pain is elicited, the muscle will likely protectively co-contract, resulting in more muscle activity (cyclic muscle pain).

A, Vapocoolant spray is applied to the upper trapezius and to the cervical muscles to eliminate myofascial trigger points. The eyes, nose, mouth, and ear are protected from the spray. **B,** Immediately following the spray, the muscles are painlessly stretched.

Pressure and Massage

- In some instances massage or manipulation of a trigger point can cause it to be eliminated.
- Care must be taken, however, not to produce pain.
- Some experts have suggested that increased pressure applied to a trigger point is also an effective eliminating technique.
- The pressure is increased to approximately 20 lb and is maintained for 30 to 60 seconds.
- If this technique produces pain, it must be stopped because the pain can reinforce cyclic muscle pain

Ultrasound and Electrogalvanic Stimulation

- Physical therapy modalities such as ultrasound and electrogalvanic stimulation (EGS) can sometimes be useful in managing trigger points.
- Ultrasound produces deep heat to the area of the trigger point, causing local muscle relaxation
- This therapy leads to reduced muscle activity and encourages muscle relaxation

Injection and Stretch

- Another effective method of eliminating a trigger point is by using injection techniques
- Most commonly, local anesthetic is injected and the muscle is painlessly stretched.
- Although the anesthetic is useful in reducing pain, it is apparently not the most critical factor in eliminating the trigger point.
- Rather, the mechanical disruption of the trigger point by the needle seems to provide the therapeutic effect.

A trigger point in the right masseter is located, trapped between the fingers, and injected (with a short 27-gauge needle).

Local anesthetic is used for two reasons:

(1) It eliminates the immediate pain, allowing full painless stretching of the muscle,

(2) it is diagnostic (i.e., once a trigger point is anesthetized, not only is the local pain reduced but the referred pain is also eliminated).

A. Stabilization appliance. B, Occlusal contacts have been marked

A stabilization (i.e., centric relation [CR]) appliance will provide even occlusal contacts when the condyles are in their anterosuperior position resting on the articular discs against the posterior slopes of the articular eminences

(musculoskeletally stable).

Eccentric guidance is developed on the canines only.

The patient is instructed to wear the appliance at night during sleep and only occasionally during the day if it helps reduce the pain.

FIBROMYALGIA (FIBROSITIS)

- Fibromyalgia is a chronic, global, musculoskeletal pain disorder.
- According to an earlier consensus report, fibromyalgia is a widespread musculoskeletal pain disorder in which there is tenderness at 11 or more of 18 specific predetermined sites throughout the body.
- Fibromyalgia is not a masticatory pain disorder and therefore needs to be recognized and referred to appropriate medical personnel.

CAUSE

- The etiology of fibromyalgia has not been well documented.
- It is likely related to an alteration in the processing of peripheral (musculoskeletal) input by the CNS.
- The descending inhibitory system, the hypothalamic-pituitary-adrenal (HPA) axis and immune systems, have been implicated.
- Although the cause of fibromyalgia is likely different than masticatory muscle pain disorders, these two conditions coexist in many chronic patients.

HISTORY

- Patients experiencing fibromyalgia report chronic and generalized musculoskeletal pain complaints in three of the four quadrants of the body that has been present for 3 months or longer.
- The patient complains of arthralgic pain with no evidence of any articular disorder.
- Sleep disturbances are a common finding along with a sedentary physical condition and clinical depression.
- CLINICAL CHARACTERISTICS
- Fibromyalgia involves the presence of at least 11 of 18 designated tender points that do not produce heterotopic pain.
- Patients suffering with fibromyalgia reveal the following clinical characteristics:

1. Structural dysfunction: If the masticatory muscles are involved, there is significant decrease in the velocity and range of mandibular movement.

2. Generalized myogenous pain at rest fluctuates over time with other fibromyalgic complaints.

3. Pain is increased with function of the involved muscles

4. Patients experiencing fibromyalgia report a general feeling of muscle weakness. They also commonly report generalized chronic fatigue.

5. Fibromyalgia is characterized by numerous tender points throughout the various quadrants of the body

6. Patients with fibromyalgia generally lack physical conditioning. Because muscle function increases pain, fibromyalgia patients often avoid exercise

DEFINITIVE TREATMENT

1. When other masticatory muscle disorders also exist, therapy should be directed toward these disorders.

2. When the perpetuating conditions are present, they should be properly addressed.

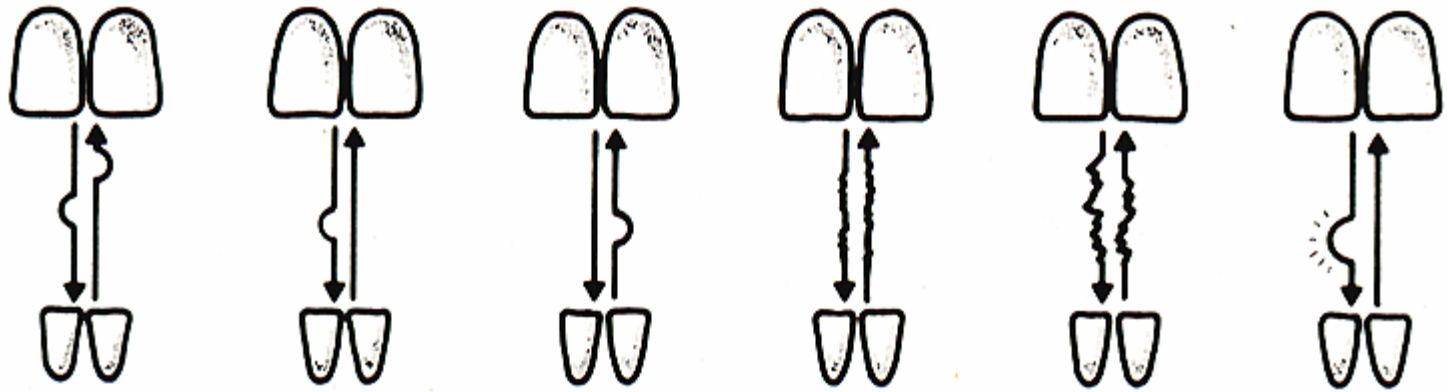
3. NSAIDs seem to be of some benefit with fibromyalgic symptoms and should be

administered in the same manner as with chronic centrally mediated myalgia.

4. If a sleep disturbance is identified, it should be addressed. Low dosages of a tricyclic antidepressant such as 10 to 50 mg of amitriptyline at bedtime can be helpful in reducing symptoms associated with fibromyalgia

5. If depression is present, it should be managed by appropriate health professionals.

TMJ SOUNDS



DERANGEMENTS OF THE CONDYLE-DISC COMPLEX

This category is divided into two subcategories for the purpose of treatment:

1. Disc displacements/disc dislocations with reduction
2. disc dislocations without reduction

INTERNAL DERANGEMENT

- **First described by Hey and Davies (1814) as a localized mechanical fault interfering with smooth action of a joint.**

Pathogenesis

- Internal derangement is a progressive anterior and medial subluxation of meniscus from its normal position at rest.
- Previous trauma may lead to stretching of lower lamina of bilaminar zone, allowing posterior band to sublux forward in relation to condylar head in centric relation. The first abnormality seen is a click on opening.
- The open click represents the posterior band relocating posteriorly over the condyle from its subluxed position.

- Pain at this stage represents the meniscus beginning to lose its insertion into lateral pole.
- Following further trauma (acute or chronic), the meniscus subluxes progressively forwards and medially, so that it cannot regain its position over condylar head on wide opening.
- Inflammation associated with damage to meniscal attachments and joint surface by incorrect positioning of meniscus leads to formation of exudates and eventual adhesions and fibrosis. This fibrosis maintains meniscus in subluxed position, and the joint becomes locked. There will be painful restriction of opening.

Etiology

- Trauma, either macrotrauma or microtrauma.
- Macrotrauma can be direct or indirect.

Direct trauma

- Trauma to mandible in open mouth position
- Can also be iatrogenic
- Intubation procedures
- Third molar extractions
- Long dental appointments
- Overextension of jaw causes elongation of the ligaments each time.

Indirect trauma

- Cervical flexion-extension injury.

Microtrauma

- Bruxism or clenching
- Mandible orthopaedic instability

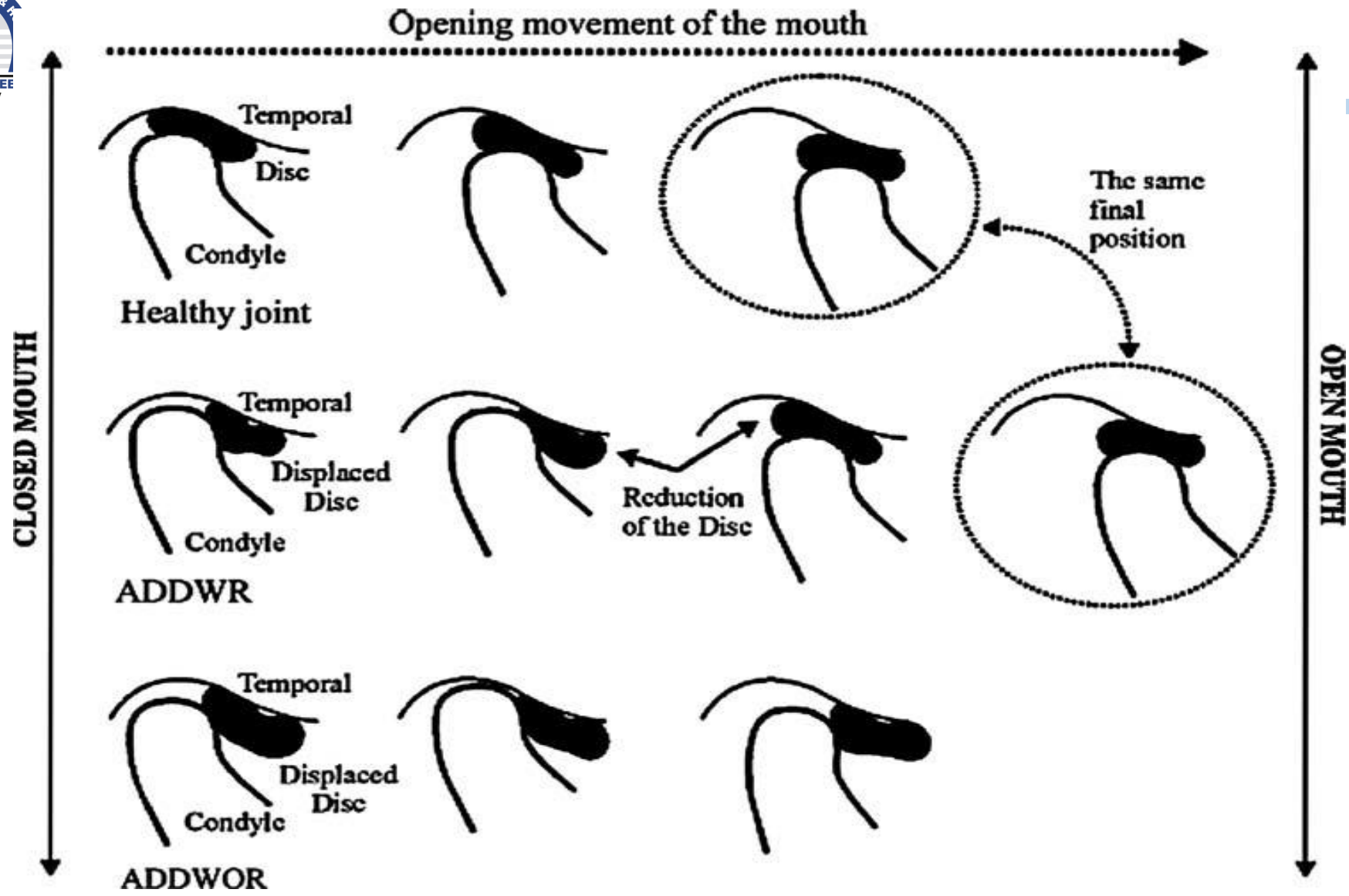
Clinical and Diagnostic Features

- History of severe pain on yawning
- History of direct trauma to the joint years earlier
- Opening click
- Reciprocal click
- Joint tenderness, especially with function
- Deviation to affected side till clicking occurs
- Deviation of opening
- Crepitus
- Trismus - 20 to 25 mm inter-incisal
- Continuous pain on side of face and head exacerbated by moving the jaw.
- Elimination of pain following local anaesthesia of the affected joint.

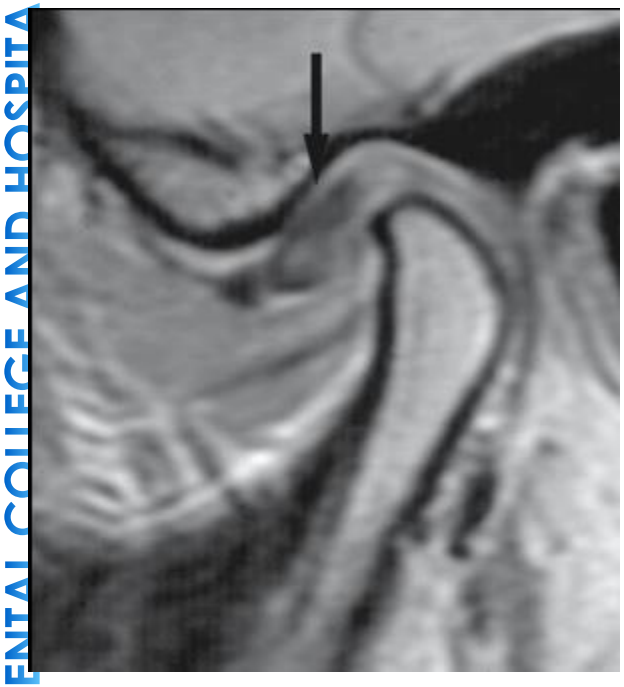
Internal Derangements

Imaging Features

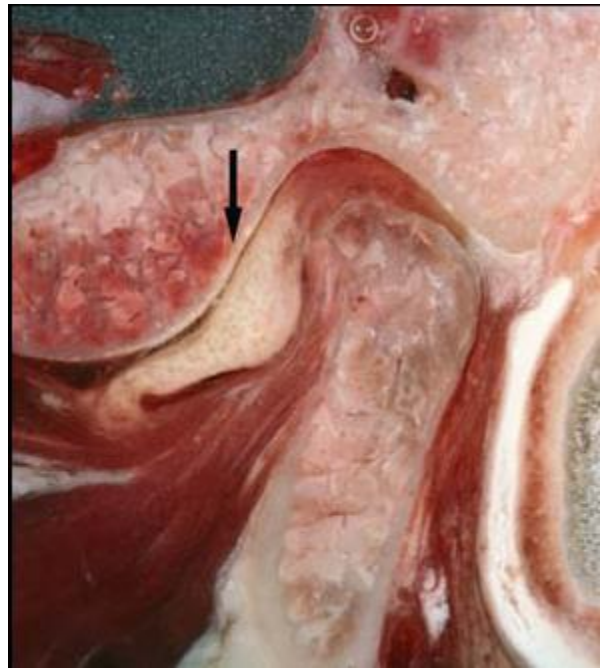
- Anterior disc displacement: posterior band of the disc located anterior to the superior portion of the condyle at closed mouth on oblique sagittal images
- Disc may have normal (biconcave) or deformed morphology
- In opened mouth position disc may be in a normal position (“with reduction”) or continue to be displaced (“without reduction”)



Complete anterior disc displacement



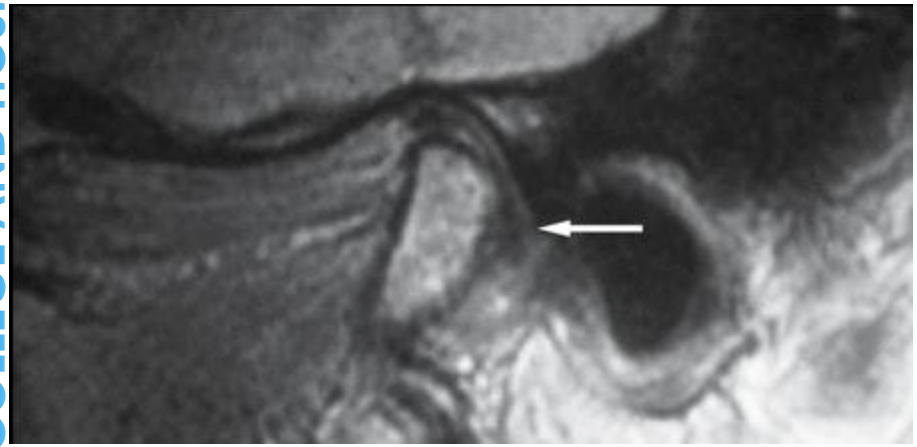
medial section

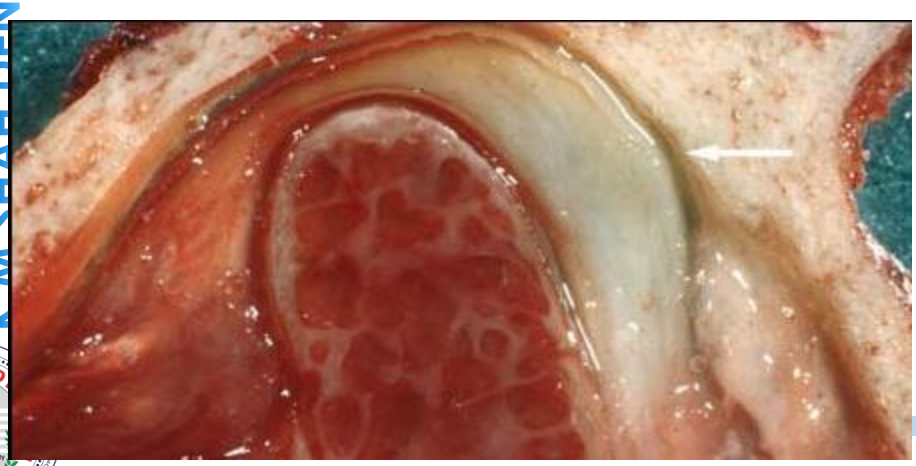


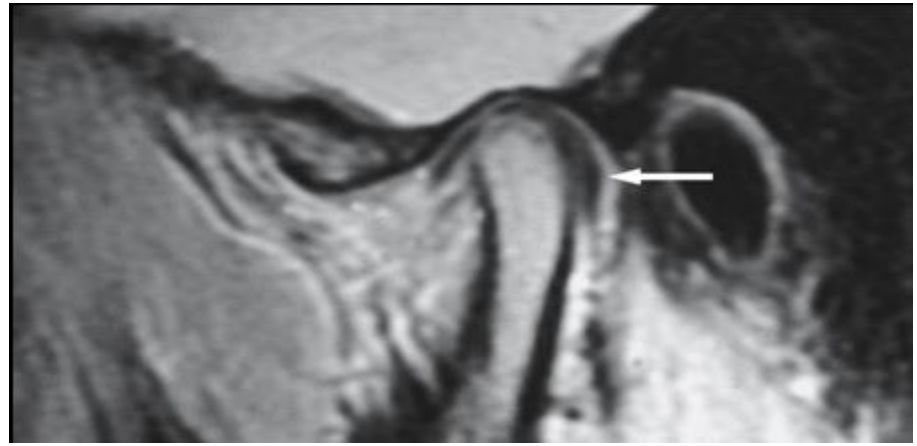
Autopsy

Open-mouth MRI

Posterior disc displacement







Management

Conservative Management

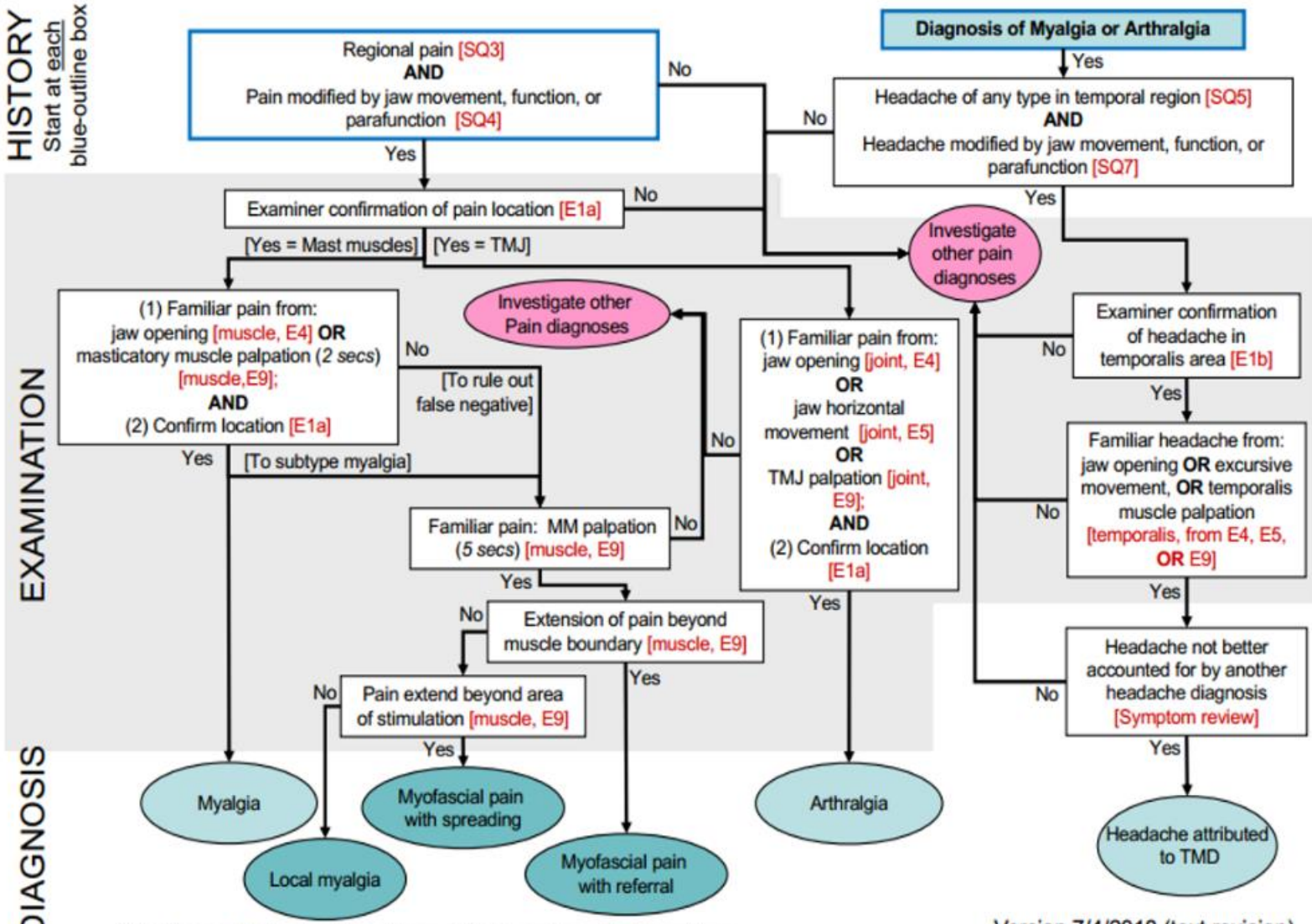
1. Reassure the patient
2. Use of tricyclic drugs in patient with history of bruxing, clenching and tenderness of muscles of mastication. They act to reduce jaw movements during sleep.
3. Mild sedative may be prescribed to overcome anxiety and tension.
4. Occlusal splints- anterior positioning splint
5. NSAIDs in cases of acute episodes of pain
6. Intra-articular injection of steroid for acute pain and tenderness in the joint.
   - 1 ml hydrocortisone along with 1 ml of local anaesthetic is injected into the joint.

Surgical management

- Arthrocentesis and lavage
- Arthroscopy
- Disc repositioning
- Disc removal
- Disc removal and
  - Autologous graft disc replacement
  - Autologous flap reconstruction
  - Alloplastic disc replacement
- Condylotomy
- Condylectomy.

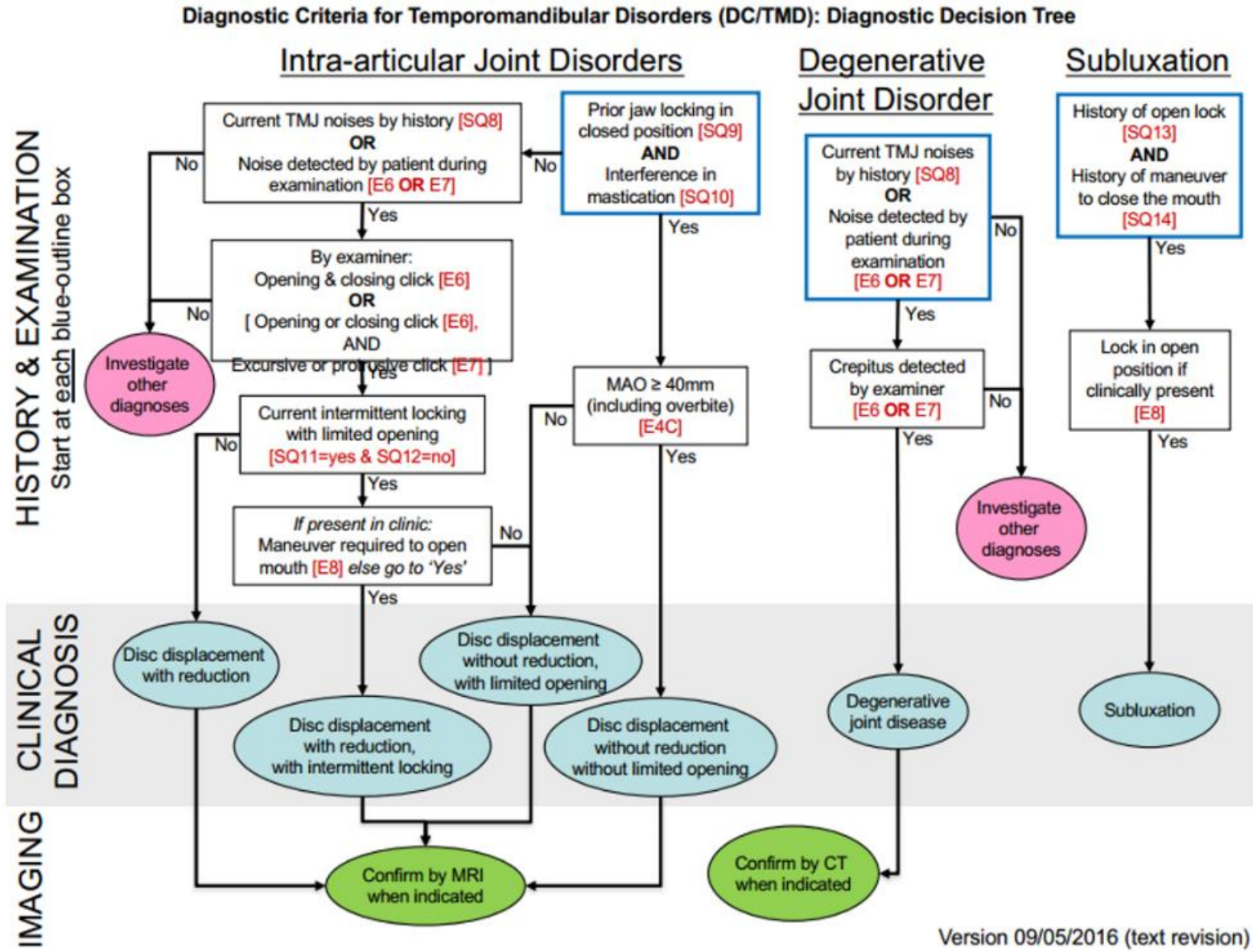
Diagnostic Criteria for Temporomandibular Disorders (DC/TMD): Diagnostic Decision Tree

Pain-Related TMD and Headache



Note: 2 secs palpation is sufficient for myalgia; 5-secs is required for subtypes

Version 7/4/2018 (text revision)



1.
   a) Disc derangement
   b) Rheumatoid arthritis
   c) Myofascial pain
   d) Osteoarthritis

2. Still's disease is
   a) Juvenile osteoarthritis
   b) Juvenile RA
   c) Juvenile
   d) Jhkhv

3. Fibromyalgia
   a) Localised muscle pain
   b) Genaralised muscle pain
   c) Ankylosis
   d) osteoarthtritis

4. Reciprocal click
   a) OA
   b) RA
   c) Bony ankylosis
   d) IDDWR

5. Common cause of muscle splinting
   a. Bruxism
   b. High point
   c. Stress
   d. All of the above