

BDS Year 4 Regular & Casual batch Academic Year 2023-2024 Subject: Oral Medicine and Radiology Topic: TMJ Disorders Part 1

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Structurally and functionally TMJ can be divided into two system:

- 1) Inferior joint cavity-(btw condyle and articular disc)
- Allows rotational movement
- Disc and its attachment to the condyle are called condyle-disc assembly.
- 2) Superior joint cavity
- condyle-disc complex functioning against the surface of mandibular fossa;
- Rotation as well as translation possible.





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During translation, the combination of disc morphology & interarticular pressure maintains the condyle on the intermediate zone and disc is forced to translate forward with the condyle.



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Palpation

- > Bimanual and bidigital palpation.
- The lateral pole of condyle most accessible for palpation during mandibular movements.
- > 2 methods- Intra- auricular
 - **Pre- tragus**





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Intra-auricular palpation.





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Joint tenderness-

- Location of the joint tenderness (e.g., lateral, posterior)
- Palpation just anterior and posterior to the lateral pole should detect pain associated with TMJ capsular ligament.

Joint noises-

- The most common forms of joint noise are clicking (a distinct sound)
- crepitus (i.e., multiple scraping or grating sounds).







- The muscles should be palpated for the presence of
- tenderness
- > spasm
- trigger points





Medial pterygoid- By running a finger in an anteroposterior direction along the medial aspect of the mandible in the floor of the mouth.













➤ Trapezius







RADIOGRAPHIC EXAMINATION OF TMJ

Panoramic view













A SUMANDEEP VIDYAPEETH K M SHAH DENTAL COLLEGE AND HOSPITAL reflexes



collection of symptoms frequently observed in various combinations first described by Costen (1934, 1937), which he claimed to be due to irritation of the auriculotemporal and/or chorda tympanic nerves as they emerged from the tympanic plate caused by altered anatomic relations and derangements of the temporomandibular joint associated with loss of occlusal vertical dimension, loss of posterior tooth support, and/or other malocclusions.



[Acc. To Okeson]

- TMD is a term used to describe a number of dysfunctional conditions involving the masticatory system.
- This term is embracing a number of clinical conditions that involve the masticatory musculature, TMJ and associated structures or both.





HISTORY OF TMDs

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The dental profession was first drawn into the area of TMDs with an article written by Dr.James Costen, an otolaryngologist in 1934. On the basis of 11 cases, he first suggested to the profession that changes in the dental conditions were responsible for various ear symptoms.

In the late 1930s and through the 1940s, biteraising appliances were used as the most common therapy for managing pain problems.







Scientific investigation of TMDs first began in 1950s. Early scientific studies suggested that the occlusal condition could influence the masticatory muscle function.





- Occlusion and emotional stress were accepted as the major etiologic factors of disorders of the masticatory system in the 1960s and 1970s
- In 1970s, an explosion of interest in TMDs took place.
- It was not until the 1980s that the profession began to recognize fully and appreciate the complexity of TMDs.









Weldon Bell (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







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Inflammatory joint disorders

- Rheumatoid arthritis
- Infective arthritis
- Metabolic arthritis
- Growth Disorders of the joint
 - Developmental disorders
 - Acquired disorders
 - Neoplastic disorders

Chronic mandibular Hypomobility

 Ankylosis – fibrous & osseous
 Fibrosis of articular capsule
 Contracture of elevator muscles
 Myostatic contracture
 Myofibrotic contracture









A. Disorders of the condyle

a. Developmental

- ✤ Agenesis
- * Hyperplasia
- * Hypoplasia
- **b.** Traumatic
 - Fracture
 - * Ankylosis
- c. Neoplastic
 - * Benign
 - Malignant



a. Displacement

- With reduction $\mathbf{\mathbf{v}}$
- Without reduction $\mathbf{\mathbf{v}}$
- **b.** Disorders of the synovial apparatus
 - Acute inflammation I.
 - **II.** Chronic inflammation
 - **Rheumatoid arthritis** $\mathbf{\mathbf{\hat{v}}}$
 - **Psoriatic arthritis** \diamond

c. Ankylosing spondylitis

- d. Suppurative arthritis
 - Gout ٠.











- **Group I: Muscle disorders** Α.
 - a. Myofascial pain
 - b. Myofascial pain with limitations in aperture
- **Group II: Disc displacement B**.
 - 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



Rajendran R. Shivapathasundharam B et al

- K M SHAH DENTAL COLLEGE AND HOSPII SUMANDEEP VIDYAPEETH
- I] <u>Developmental Disorders:</u>
 - *****Hypoplasia or Aplasia of condyle
 - a. Congenital/ primary
 - **b.** Acquired / Secondary
 - Condylar Hyperplasia
 - ✤ Bifid Condyle
- II] Traumatic disturbances of TMJ:
 - ***** Dislocation of the Condyle
 - * Ankylosis
 - * Injuries to articular disk: Internal Derangement
 - Condylar Fracture.

III] Inflammatory Disorders of TMJ

- Osteoarthritis
- Rheumatiod Arthritis
- Septic Arthritis
- IV] Neoplastic Disturbances
- V] Loose Joint Bodies
 - Synovial Chondromatosis





ETIOLOGY OF TMD



≻Trauma

- **Emotional stress**
- Deep pain input
- **Parafunctional habits- nocturnal**
 - diurnal





Occlusal condition

Can cause TMDs by 2 mechanisms-

- Introduction of acute changes in occlusal condition can lead to a muscle pain condition.
- Presence of orthopedic instability- Problems with bringing the teeth into occlusion are answered by the muscles.





Disorders of occlusion & dysfunction of masticatory system including TMJ can be due

- to potential disorders like-
- > Occlusal interferences.
- Discrepancy between centric relation & centric occlusion.
- Loss of teeth.
- Malocclusion.
- > High point restorations or crowns
- > Open proximal contact.
- Loss of vertical dimension .
- Increase tooth mobility.





Trauma

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Microtrauma- Any small force that is repeatedly applied eg. activities like bruxism or clenching can produce microtrauma to the tissues that are being loaded (i.e. teeth, joints or muscles.)





Emotional stress

> Hypothalamus, reticular system (particularly limbic system)

Responsible for emotional state of the individual and also influence muscle activity





During stress

Activation of hypothalamus

Contraction of muscle fibres



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Any source of constant deep pain input can represent an etiologic factor that may lead to limited mouth opening and hence clinically present as TMD





Parafunctional activities

- Any activity that is not considered functional(chewing, speaking and swallowing)
- > Diurnal- Clenching and grinding
 - **Cheek and tongue biting**
 - **Thumb sucking**
 - **Unusual postural habits**
- > Nocturnal- Bruxism




DEVELOPMENT OF FUNCTIONAL DISTURBANCES IN THE MASTICATORY SYSTEM

Normal function + Event > Physiological tolerance





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> Local

- **1.Placement of an improperly occluding crown**
- 2. Secondary to trauma involving tissues
- **3.Too wide mouth opening**
- 4.Bruxism- sub-conscious, non-functional grinding of teeth
- Systemic events- Increased level of emotional stress





- THE PROPERTY Developmental Disorders
 - Kaneyama et al classified -
 - Condylar Hyperplasia
 - Hypoplasia or Aplasia of the condyle
 - Sifid Condyle











Etiology:

- Developmental
- Neoplastic
- Bone disease
- ✤ Hereditary
- Endocrine
- * Age and sex—Either sex and no predilection for any Side.
- Most common age 15 to 19 years



Signs and Symptoms:

- If Unilateral, Signs:
- ✤ Facial asymmetry
- Shifting of the midline of the chin to the unaffected side, with resulting cross bite, or open bite on the affected side and asymmetric protrusion.

If Bilateral, Signs:

- Anterior cross bite
- Obtuse mandibular angle and sigmoid notch forms an arc of a larger circle.
- Definite disproportion between normal size of crown of teeth and larger size of jaw bones.







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Radiographic Features:

- and body **Ramus** of mandible- Affected side is larger
- ✤ Condyle Assume a conical, spherical in or an uneven and lobulated shape.
- The neck of the condyle may retain its integrity, be enlarged or absorbed into the enlarged head of the condyle.



Management:

Orthognathic Surgery to improve esthetics and function of mandible.



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Evidence

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SUMANDEEP VIDYAPEETH SHAH DENTAL COLLEGE AND HOSPITA	Authors	Saridin CP, raijmakers PG, Becking AG
	Title	Bone scintigraphy as a diagnostic method in unilateral hyperactivity of the mandibular condyles: a Review and meta-analysis of the literature
	Aim	To compare the diagnostic accuracy of planner and SPECT bone scans.
	Results	The pooled sensitivity of planner bone scan was 0.71, which was significantly lower than that of bone SPECT technique which was 0.90. the pooled specificity of the SPECT scan was 0.95, which did not significantly differ. From that of planner scan.
	Interpertatio n	Bone scans are best performed using SPECT, conducting a quantitative analysis by calculating the percentile differences between the left and right condylar regions
X		







- Characterized by facial deformity expressed on the affected side by a short mandibular ramus.
- This may occur unilaterally or bilaterally

Etiology-

- Congenital due to pharyngeal first or second arch malformation
- Trauma, infection, or irradiation during the growth period.





Clinical Features

Unilateral condylar Hypoplasia:

- Shifting of the chin towards the shorter side of the face.
- It is often accompanied by deviation of the mandible on mouth opening and occlusion is disturbed



Bilateral condylar Hypoplasia:

- ✤ Bird-like face,
- Retruded chin
- Small mandibular arch







Syndromes Associated

- Goldenhar Gorlin syndrome
- Craniofacial microsomia
- Dyke-Davidoff-Masson syndrome
- ✤ Femoral-facial syndrome
- **Bilateral Condylar Hyperplasia**
- Pierre Robin syndrome
- ***** Treacher-Collins syndrome









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Radiographic Features



- Condyle- Short condyloid process. The neck of the condyle is slender.
- Ramus and body of mandible-there may be proportionate shortening of the ramus
- Coronoid process—A relatively large, heavier and posteriorly directed coronoid process.
- Bilateral involvement- In cases of bilateral under development, all the above features plus bilateral antegonial notching is seen.





SUMANDEEP VIDYAPEETH Deemed to be University









<u>Treatment</u>

- **♦** Osteoplasty
- Orthodontic appliances
- Cosmetic surgery









Hemifacial macrostomia

Agenesis of Condyle

Goldenhar syndrome





Clinical Features

- Occur unilaterally or bilaterally and is a very rare condition.
- Free movement (eccentric movement)
- anterior open bite
- asymmetry of face, altered occlusion
- Shift of mandible towards the affected side occurs, during opening in unilateral type, but it is absent in bilateral type.
- ✤ Defective and absent external ear
- Underdeveloped mandibular ramus or macrostomia.







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Radiological Features



Management

Dental intervention can aid by establishment of acceptable plane of * occlusion, maintaining the oral health and offering palliative treatment for discomfort.

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If the derangements are severe, osteoplasty advocated.





Etiology

- Persistence of the well vascularized fibrous tissue septa in the condylar cartilage during embryonal and early postnatal life.
- Possible rupture of some of the blood vessels contained within the septa might impair the ossification of the condyle





<u>Clinical Features</u>



- SUMANDEEP VIDYAPEETH M SHAH DENTAL COLLEGE AND HOSPITAL
 - Sex—it is usually unilateral and more common in females with a ratio of 3:2.
 - Symptoms-—Limitation of opening of mouth, a small lateral deviation.
 - Signs- Lateral movement is limited





Radiological Features



- Double mandibular condyle.
- There may be two separate glenoid fossa.







- Osteoarthritis
- Rheumatiod Arthritis
- Septic Arthritis
- Psoriatric Arthritis
- Gout or Pseudogout
- Ankylosing spondilytis









SUMANDEEP VIDYAPEETH K M SHAH DENTAL COLLEGE AND HOSPITAL joint disease It is a group of mechanical abnormalities involving degradation of joints, including articular cartilage and subchondral bone. **Etiology**: Trauma (acute or chronic)

- Infection
- Metabolic disturbances





Pathophysiology



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Repetitive overload in excess of their functional capacity

Aging process

Increase in the functional demands of the healthy tissue

Deterioration in the functional capacity of the tissue



Breakdown of the joint



Clinical Features:



- 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 <u>Ely's cyst</u>
- ✤ Joint Mice









Medicinal treatment:

- Conservative therapy includes NSAID's, heat, soft diet, rest and occlusal splints that * allow free movement of the mandible.
- 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.

Surgical Treatment:

It may be indicated to remove the loose fragments of bone (so-called joint mice) and $\mathbf{\mathbf{\dot{v}}}$ reshape the condyle.



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Rheumatoid Arthritis

Sir Alfred Garrod established the distinction between RA and gout in 1859 and gave the condition its present name.







Clinical features



Extra-Articular Manifestations

- Rheumatoid nodule
- Vasculitis
- Neurological
- Lymphadenopathy
- * Carditis









Clinical Features

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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 disease 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'.

Differential Diagnosis:

- DJD
- Psoriatric Arthritis







- hibitory to
- Nonsteroidal antiinflammatory drugs these drugs are inhibitory to prostaglandins.
- 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.
- Local treatment it is done with heat, diathermy, jaw exercise or a mouth stretcher.
- Muscle strengthening exercise





Evidence

Authors	Ringold S, Tzaribachev , Cron RQ
Title	Management of TMJ arthritis in adult rheumatology practices: a survey of adult rheumatologists
Aim	To describe adult rheumatologists' approaches to the diagnosis and treatment of TMJ arthritis in adults with JIA or RA
Results	Respondents estimated that 1-25% of their patients with RA or JIA had TMJ arthritis. Respondents reported lower rates of MRI use (19%) and higher rates of use of splinting/functional devices (50%) than anticipated. Approximately 80% of respondents reported that their practice had a standardized approach to the evaluation of patients with TMJ arthritis. The most commonly used medical therapies were non-steroid anti- inflammatory drugs, anti-tumor necrosis factor alpha medications, and methotrexate.
Interperta tion	Standardizing the evaluation and treatment of TMJ arthritis across practices may benefit both adult and pediatric patients.









- SUMANDEEP VIDYAPEETH M SHAH DENTAL COLLEGE AND HOSPIT
- Synonym: Still's Disease
- TMJ arthritis in children with chronic arthritis was first reported by Still in his initial case series in 1897.
- 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 and 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, leukocytosis, pyrexia and rash









Radiographic feature



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





- SUMANDEEP VIDYAPEETH M SHAH DENTAL COLLEGE AND HOSPITAL Systemic Therapies: weekly methotrexate * **Combination therapy with methotrexate and infliximab** *
 - **TNF-alpha inhibitors** *
 - **Intraarticular Therapies** *
 - triamcinolone acetate or triamcinolone hexacetonide **
 - performed with CT guidance. *




Evidence

Authors	Argyropoulou MI et al. ++
Title	TMJ involvement in Juvenile arthritis: Clinical predictors of MRI signs
Aim	To define predictors of MRI findings of TMJ involvement in Juvenile Arthritis.
Results	Condyle was observed in 32%, flattened articular eminence in 27%, flattened articular disk in 17%, intra-articular fluid in 10%, enhancing pannus in 45% and restricted condylar motion in 9%.
Interpertatio n	the systemic type of JIA is at young age at onset and long duration of activity are risk factors for TMJ damage. MRI of the TMJ should be performed in patients who are less than 4 years of age at the onset of JIA, and in those with the systemic type, whatever the age of onset.









The first description of Psoriatic arthritis given in early 19th century but it was identified as distinct identity by American Rheumatology Association only in 1964.





Pathophysiology

- Hereditary transmitted as a simple dominant trait.
- Presence of HLA-B27 antigen.
- **Precipitating factor includes -***
 - > Infection by various microorganisms
 - > Metabolic disturbances
 - Endocrine dysfunction
 - Neurogenic factors and trauma.







<u>Clinical Features</u>

- MANDEEP VIDYAPEETH M SHAH DENTAL COLLEGE AND HOSPITAL
- Psoriasis of skin may predate the onset of cases or follow the onset of arthritis in 15% of cases.
- Nail involvement (pitting)
- Separation from nail bed (onycholysis)
- Yellow discoloration (known as oil drop sign)
- Dactylytis (sausage digits) and absence of RH factors.







*

- TMJ involvement is described as episodic, sudden and usually unilateral
- Limitation of mandibular movements *
- Morning stiffness, crepitus, eventual loss of interincisal opening *
- In advanced disease, *
 - Ankylosis can occur. *





Radiological Features

- TMJ condylar destruction
- Narrowing of joint space anterior position of condylar head
- Flattening of articular eminence
- Erosion of condylar head and roof of glenoid fossa and osteophytic

formation are seen

Psoriatic arthropathy. Oblique coronal and oblique sagittal CT images show punched-out erosion in lateral part of condyle (arrow).













- * NSAIDs
 - Piroxicam
 - Indomethacin
 - Ibuprofen
 - Diclofenac
 - Ketaprofen
- Intra-articular or low-dose systemic corticosteroids
- TNF inhibitor, is also an approved therapy for patients with psoriatic arthritis.







Synonyms:

- Marie-Strumpell Disease
- Sechterew's disease





Pathophysiology



✤ Ankylosing spondylitis (AS) is a systemic rhe

disease, meaning it affects the entire body.

- Approximately 90% of AS patients express the HLA-B27 genotype.
- Tumor necrosis factor-alpha (TNF α) and Interleukin-1(IL1).





Clinical Features

- Enthesitis
- Dactylitis
- Peripheral arthritis
- Limitation of TMJ movement
- Gross restriction of jaw movement.











Decreased range of motion and





Radiographic Features

- Source of the second second
- Erosions,
- Decreased mobility
- Beaking and osteophytosis
- Demineralization
- Extensive sclerosis





Spinal syndesmophytes

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- Acrylic splints or the renewal of faulty prosthese
- ***** The drug with proven efficacy is sulfasalazine.
- Surgical intervention should be limited to those patients with severe crippling disease.





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* Synonym : Infectious arthritis

- Septic arthritis is inflammation of a synovial membrane
 with purulent effusion into the joint capsule, due to
 infection.
- Bacterial, but sometimes viral and fungal.
- Substitution State of the st
 - are : E.coli, Proteus, Streptococcus









Solution States Stat

Haematogenous

Most common form of spread
 Usually affect people with underlying medical problem

Direct inoculation

-May result from penetrating trauma -Introduction of organisms during diagnostic and surgical procedures. For eg arthroscopy and intra-articular injection

Direct spread from adjacent focal infection

- -More common in children.
- -Osteomyelitis usually begin in the metaphyseal region, from which it breaks through the periosteum into the joint.





Clinical Features



In new born infants

- More on septicaemia Rather than joint pain
- Baby is irritable & refuse to feed
- Tachycardia with fever
- Joints are warmth, tenderness, resistance to movement
- Umbilical cord and inflamed IV site should be suspicious of source of infection





In children



- Acute pain in single large joint (esp hip)
- Rapid pulse and swinging fever
- Overlying skin looks red & superficial joint swelling may be obvious
- Local warmth and marked tenderness
- All movements are restricted by pain or spasm.









- Often in the superficial joint(knee, wrist or ankle)
- Joints painful, swollen & inflamed.
- Warmth and marked local tenderness & movement restricted.
- Look for gonococcal infection or drug abuse.
- Patient with rheumatoid arthritis and especially those on corticosteroid may develop "silent" joint infection.





- Full blood count-Elevated white blood cell count
- ESR-> 40 mm/hr
- Blood culture-May be positive

Synovial Fluid Examination

- Gross examinations include appearance, volume, viscosity, mucin clotting (amount of proteoglycans).
- Microscopic examinations include leucocyte count, staining of smears, serum glucose ratio, protein.
- Finally, culture and sensitivity for definitive diagnosis and treatment.



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- Early Stage Normal
- Look for soft tissue swelling, loss of tissue planes, widening of joint space and slight subluxation due to fluid in joint. Gas may be seen with *E. coli* infection
- Late stage Narrowing and irregularity of joint space
- Plain film findings of superimposed osteomyelitis may develop (periosteal reaction, bone destruction, sequestrum formation).





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Narrowing of joint space and irress subchondral bone.



Joint space loss



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Treatment

- General supportive care
 - Analgesics
 - IV fluids
- Splintage
 - The joint must be rested either on a splint or in a widely split plaster
- Antibiotics
 - Treatment is started once the blood and samples are obtained without waiting for the detail results.
 - Choice of antibiotic depends on the most likely pathogen







<u>Surgical Management</u>

• Surgical Drainage

 Arthroscopic debridement and copious irrigation with normal saline – more frequently in knee joint septic arthritis









- Bone destruction and dislocation of the joint
- •Cartilage destruction
 - -may lead to either fibrosis or bony ankylosis
 - -in adult partial destruction of the joint will result in secondary osteoarthritis
- •Growth disturbance
 - Presenting as either localized deformity or shortening of the bone







- Includes polyarthritis, urethritis, conjunctivitis
- Triggered by an infection
- More frequent in male
- ✤ In 3rd decade
- Infection by: chlamydia, mycoplasma, yersinia
- ✤ 25% of patient involve TMJ



Pain swelling, stiffness of joint



<u>Treatment</u>

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***** Corticosteroids

- ***** Systemic
- **Joint Injection** *
- **Topical** *

***** Antibiotics

- **&** Lymecycline
- Azithromycin *
- Quinolones **
- Antirheumatic Drugs
 - **Sulfasalazine** **
 - mathotrexate *







hout



- Includes hyperuricemia, recurrent arthritides crystals
- Male are affected
- Calcium pyrophosphate deposition- pseudogout (Chondrocalcinosis, Calcium pyrophosphate dihydrate deposition disease)
- Exam of synovial fluid: monosodium urate crystals









Precipitating Factor

- Hypertension
- Diabetes mellitus
- Renal insufficiency
- * Hypertriglyceridemia
- * Hypercholesterolemia
- Obesity
- Anemia







Investigations

- Arthrocentosis
- Joint fluid analysis
- WBCs are High
- Serum Uric Acid Level
- Radiographs: punched out erosions or lytic areas with overhanging edges















Acute Attack: NSAIDs, Corticosteronal (Prednisolone: 40mg, 1-3 days), colchicine (1.2mg), ACTH (40IU subcutaneously)

Chronic Attack: Allopurinol (300mg/Day),
 Febuxostat (40mg /Day)





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* Synonym : Synovial Chondrometaplasia

Osteochondromatosis

- ✤ It is uncommon benign disorder characterized by the presence of multiple cartilagenous nodules of the synovial membrane that break off
- Originates from embryonic mesenchymal remnants
- Metaplastic and gets calcified
- Breaks off
- Results in clusters of free-floating calcified bodies in the joint.
- Triggered by trauma





<u>Clinical features</u>



- Slow progressive swelling in pretragus region
- Pain and limitation of mandibular movement
- TMJ clicking, Locking and crepitus





Investigations

- ***** ESR, C-reactive Protein are high
- +ve lyme titre
- X rays not useful due to lots of superimposition
- CT scan- may appear as single mass or many small single bodies
- Arthroscopy required for accurate diagnosis









- With aim of removing those loose bodies
- If small lesion- arthroscopy
- ***** If large lesion- arthrotomy
- Synovium and articular disc removed
- Extensive resection




raunatic

- Ankylosis
- Injuries to articular disk: Internal Derangement



Condylar Fracture.







- Young age group
- Chin injuries
- Contusion over chin and preauricular area
- Malocclusion
- Facial nerve deficit





Investigations

- Location of fracture, the degree and direction of displacement
- Towne Viewmediolateral position of the fractured segments
- CT scan- best for intracapsular fractures



coronal CT Scan



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lateral skull film













- SUMANDEEP VIDYAPEETH K M SHAH DENTAL COLLEGE AND HOSPITAL Adjust diet Physical therapy Closed Reduction ***** Open Reduction



UMANDEEP VIDYAPE





***** Recurrent

- Can be in anterior, posterior, lateral or superior position
- Acute-Trauma like yawning, dental extraction, seizures
- Chronic- untreated TMJ dislocation









- SUMANDEEP VIDYAPEETH M SHAH DENTAL COLLEGE AND HOSPITAL
- Anterior dislocation- extreme opening of mouth, can be unilateral or bilateral
- Posterior dislocation- direct blow to chin
- Superior dislocation- direct blow to partially opened mouth- damage to 8th cranial nerve
- Lateral dislocation- mandibular fractures, can be palpated in temporal space



<u>Clinical Features</u>





- Difficulty in swallowing and speaking
- Malocclusion
- Hearing impairment
- * Prognathia





Investigations



***** CT scan

* MRI











- Analgesia and muscle relaxation
- * local injections of fibrosing solutions to tighten the joint capsule
- Solution to the second seco
- Local anesthetics in TMJ space







Method to reduce dislocation



physician gloved on the inferior









- Greek terminology- Stiff joint
- * "Inability to open mouth due to either a fibrous or bony union between the head of the condyle and the glenoid fossa."







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 - True or False
 - Extra-articular or intra-articular
 - ***** Fibrous or Fibro-osseous or Bony
 - *** Unilateral or Bilateral**
 - Partial or complete





Etiology

<u>a)Trauma</u>

- Congenital IU trauma
- At birth-forceps delivery
- Heamarthrosis (direct/indirect trauma)
- Condylar fractures
- Intracapsular
- Extracapsular

b) Infections

- Glenoid fossa fracture (rare)
- Otitis media
- Parotitis
- Tonsilitis
- Furuncle
- Abscess around the joint
- Osteomyelitis of the jaw
- Actinomycosis

c) Inflammation

- Rheumatoid arthritis
- Osteoarthritis
- Septic arthritishematogenous spread

d) Rare causes

- Polyarthritis
- Measles

e) Systemic

- Small pox diseases
- Scarlet fever
- Typhoid
- Gonococcal arthritis
- Scleroderma
- Beriberi
- Marie-Strumpell disease
- Ankylosing spondylitis

f) Other causes

- Bifid condyle
- Prolonged trismus
- Prolonged immobilization
- Unknown (Idiopathic)
- Burns





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Fibrous Ankylosis Produced by adhesions within the TMJ affecting the fibrous components	Bony ankylosis The union of bones of the TMJ by proliferation bone cells, resulting in immobility of the joint
 Not usually associated with pain Limited range of motion on opening Deviated to the affected side Limited laterotrusion to the contralateral side No radiographic findings other that absence of ipsilateral condylar translation 	 Not usually associated with pain More marked limitation on opening There's more marked ipsilateral deviation There's more marked limitation of contralateral lateral movment There's a radiographic
	evidence of bone proliferation



<u>Clinical Features</u>



- Oral hygiene very difficult.
- In very severe cases problems with speech.



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Investigations

X-rays or other imaging tests such as CT scans or MRI can determine abnormalities in the bony or soft tissue formations in the joint.



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- Condylectomy
- Interpositional arthroplasty
- Solution State And A State And A State And A State And A State A St





Disruption within internal aspects of TMJ. Where there is displacement of disc.

Etiology:

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













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Anterior disc displacement with reduction

Clicking

- ✤ <u>2nd Stage:</u>
 - Limited mouth opening
 - **Obstruction while opening the mouth**





<u>3rd Stage:</u>

Closed lock-Clicking sounds disappear and limited mouth opening persists

Less than 30mm

Preauricular tenderness

♦ <u>4th Stage:</u>

Lost range of motion

Retrodiscal tissue perforates

Crepitus with radiographic evident finding (Flattening, sclerosis, osteophytes, erosion)







Investigations

MRI of Anterior Disc discplacement







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Evidence

Authors	Neeli AS et al.
Title	Arthrocentosis for the treatment of Internal Derangement of TMJ
Aim	To evaluate the efficacy of arthrocentosis in the treatment of internal derangement of TMJ.
Results	The mean pre-operative pain was 4.8 ± 2.65 and post-operatively at 1 year was 0.27 ± 0.45 with an average decrease of 4.72 (P = 0.000). The mean maximal mouth opening pre-operatively was 29.8 ± 2.35 mm and postoperatively 41.9 ± 2.48 mm at 1 year. The mean increase in the mouth opening was 12.1 ± 3.0 mm (P = 0.000).
Interpertation	Arthrocentesis is simple, minimally invasive procedure with less risk of complications and significant benefits in patients with TMJ internal derangement.





Treatment



- 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 s
- 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.



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*****Malignant





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Most common:

- Osteomas,
- Steochondromas
- Fibromyxomas
- Benign Giant cell lesions
- Aneurysmal bone cyst
- Ameloblastoma
- Odontogenic keratocyst
- Simple bone cyst







Clinical Features:



- Grow slowly
- Considerable size and clinically noticeable
- TMJ swelling
- Pain and decreased motion
- Facial asymmetry, malocclusion
- Coronoid tumors:
 - Painless, but progressive limitation of motion





Radiological Features:



- Altered trabecular pattern
- Destruction of region
- New abnormal bone formation
- Pedunculated, abnormal mass attached to condyle
- Interfere joint function
- Erode adjacent osseous structures







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Differential Diagnosis:



- Unilateral condylar hyperplasia,
- Coronoid tumors



- Surgical excision of tumor
- Occasionally excision of condylar head or coronoid head





*Malignant Jumor** Primary – rare

- Chondrosarcoma, osteogenic sarcoma, synovial sarcoma, fibrosarcoma of joint capsule
- or metastatic- shows direct extensions of adjacent tissues
 - Salivary gland malignancies
 - Rhabdomyosarcoma
 - Regional sarcoma from skin, ear or nasopharynx



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Clinical Features:



Asymptomatic

- TMJ dysfunction: pain, limited mandibular opening,
- Mandibular deviation and swelling





Radiological Features:



Variable degree of bone

destruction with ill-

defined, irregular margin

Soft tissue calcifications






*

Differential Diagnosis:

Degenerative Joint disorders



- Wide surgical removal of tumor
- May include radiotherapy and chemotherapy





<u>References</u>

- Greenberg MS, Glick M, Ship JA. Oral Medicine. 11th Ed. Bc Decker. 2008. Ch 9: TMJ disorder: 223-257.
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ASSESSMENT



Joint mice are seen in

- a) **Psoriatic arthritis**
- **b)** Rheumatoid arthritis
- c) Septic arthritis
- d) Osteoarthritis
- 2. Still's disease is
 - a) Juvenile osteoarthritis
 - **b)** Juvenile RA
 - c) Juvenile
 - d) Jhkhv
- 3. Ely's cyst is seen in
 - a) IDD with reduction
 - **b) IDD** without reduction
 - c) Ankylosis
 - d) osteoarthritis



SUMANDEEP VIDWERSTET 4. Pencil shaped condyle is seen in

- a) OA
- b) RA
- c) Bony ankylosis
- d) **IDDWR**

5. Stiff joint is

- a. Ankylosis
- **b.** Subluxation
- c. Condylar fracture
- d. Hypermobility



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Thank You