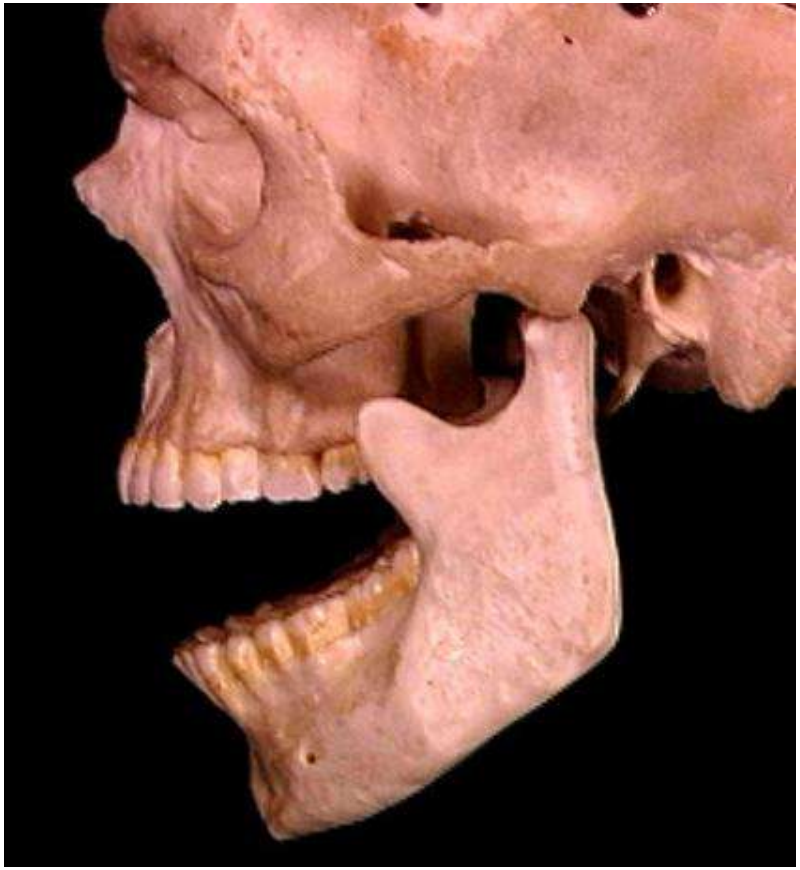
TEMPOROMANDIBULAR JOINT



DR. PRAJESH DUBEY

DEPTT.OF MAXILLOFACIAL SURGERY

INTRODUCTION

- TEMPOROMANDIBULAR JOINT IS AN IMPORTANT PART OF MASTICATORY SYSTEM
- IT IS A GIGLYMOARTHRODIAL JOINT
- IT IS A COMPOUND JOINT
- FUNCTIONS IN BRIEF ARE-------

  *smooth movement of mandible

  *firm stable base for mandible

  *attaches structure assosciated with speech

  *provides sensory input to activate protective neuromuscular reflex

SURGICAL ANATOMY OF

TEMPOROMANDIBULAR

JOINT

INTRODUCTION

- Temporomandibular joint
- Craniomandibular joint
- Ginglimoarthrodial joint
- Modified ball socket joint

INTRODUCTION

- Classification of joint
  - Fibrous
  - Cartilagenous joint
  - Synovial joint

TEMPOROMANDIBULAR JOINT

1. ARTICULATING SURFACES COVERED BY VASCULAR FIBROUS TISSUE

2. RIGHT & LEFT TEMPOROMANDIBULA ARTICULATIONS ARE INTER-DEPENDANT

3. CRANIUM AND MANDIBLE CARRY TEETH, WHOSE SHAPE AND POSITION INFLUENECE MOVEMENT OF JOINT

ANATOMY OF THE TEMPOROMANDIBULAR JOINT

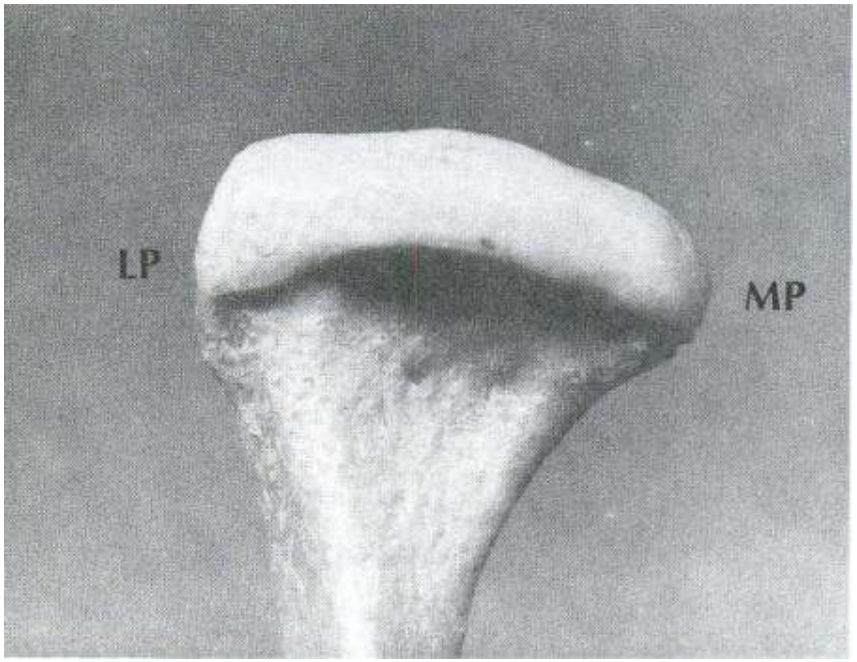
- Mandibular condyle
- Articular disc
- Articular fossa
- Articular Capsule
- Ligaments of TMJ

MANDIBULAR CONDYLE

- ***Dimensions***

  15 – 20mm mesiolaterally

  8 -- 10 mm anterioposteriorly



- ***Shape***

  Convex, ovoid bony knob on a narrow mandibular neck.

  Medial pole

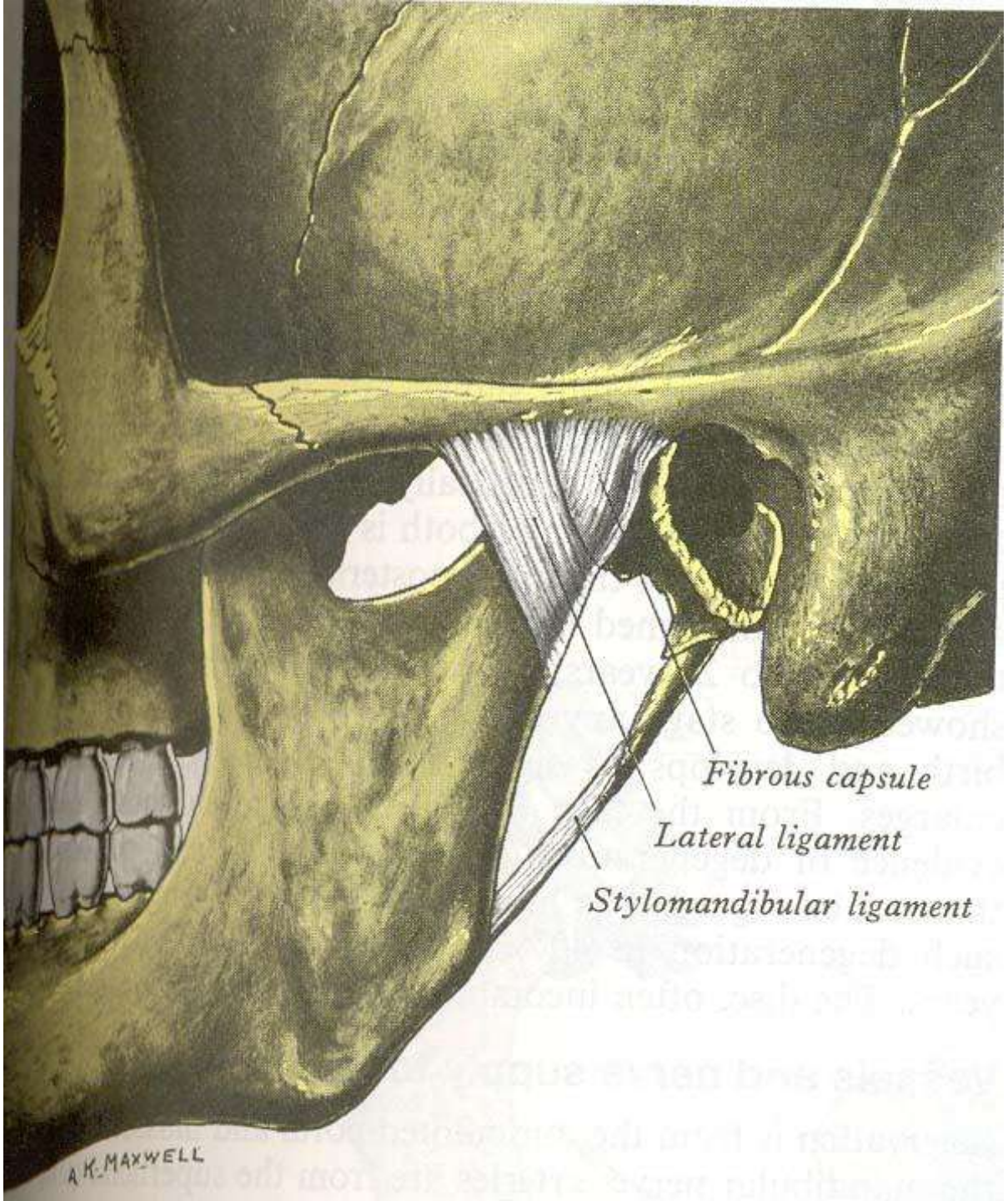
  Lateral pole

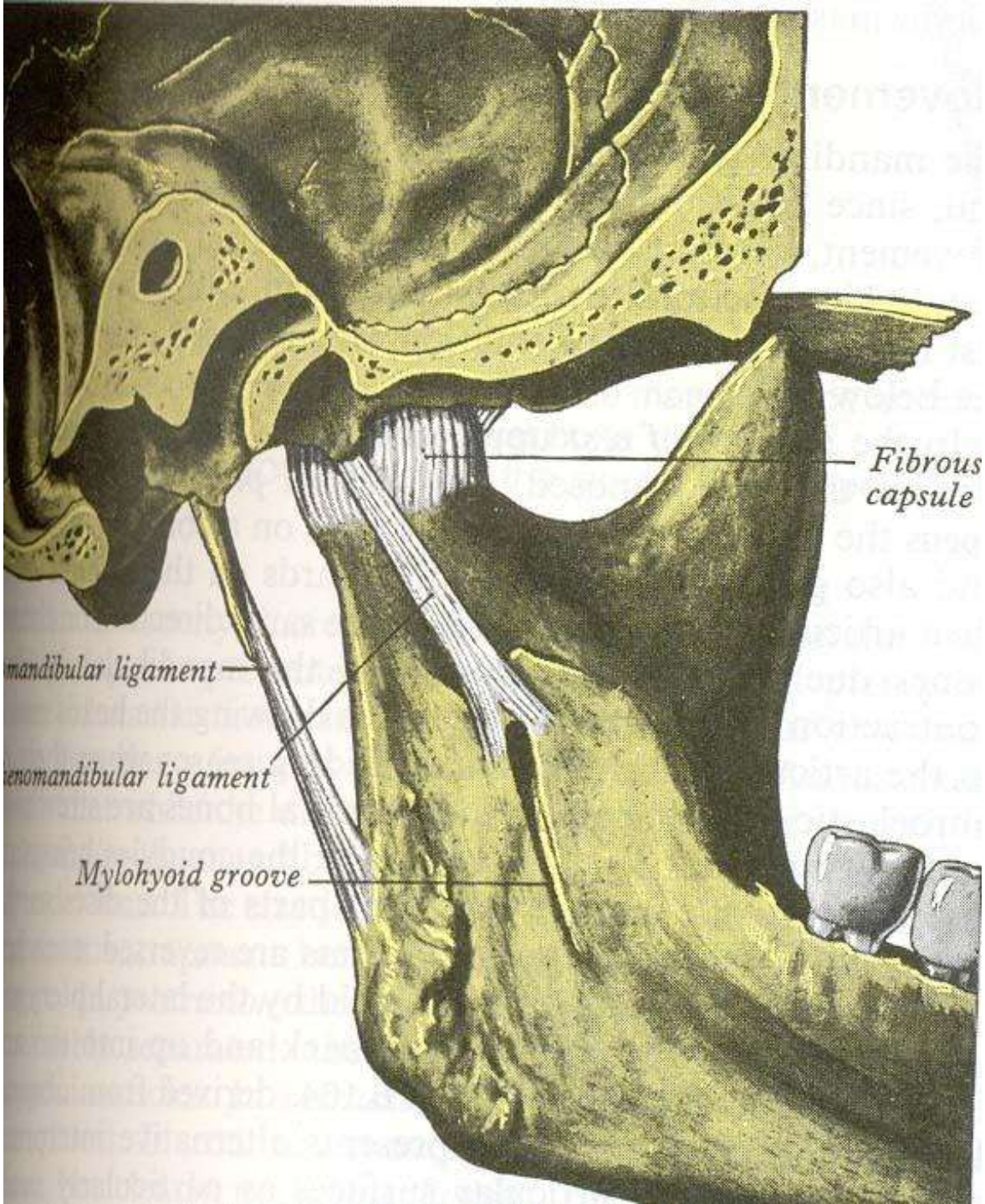
Growth center - controversy

Ligaments of TMJ

- Intrinsic
  - Temporomandibular Ligament
  - Collateral ligaments

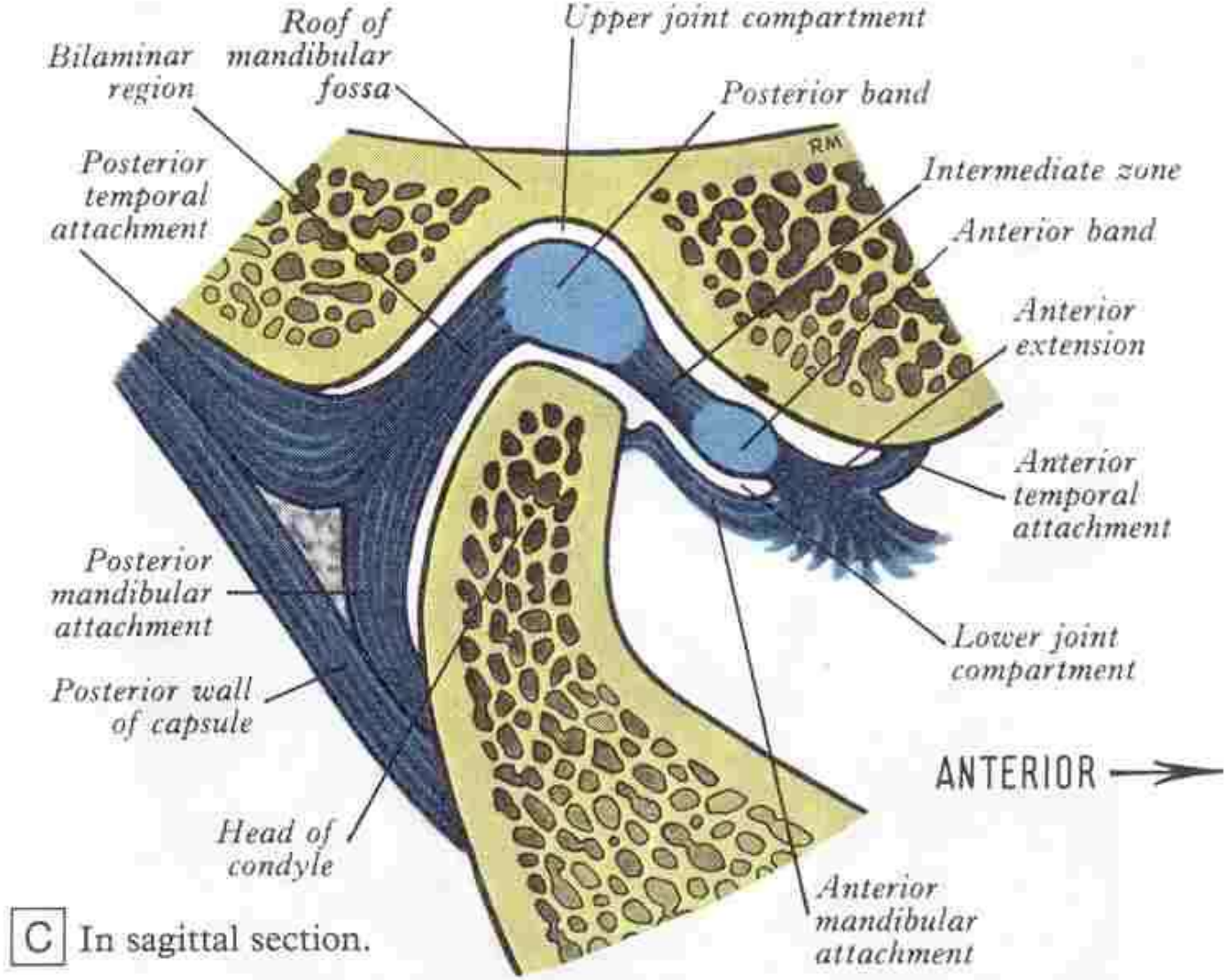
Extrinsic
- Sphenomandibular
- Stylomandibular
- Pterygomandibular Raphe


Fibrous capsule
Lateral ligament
Stylomandibular ligament
A.K. MAXWELL

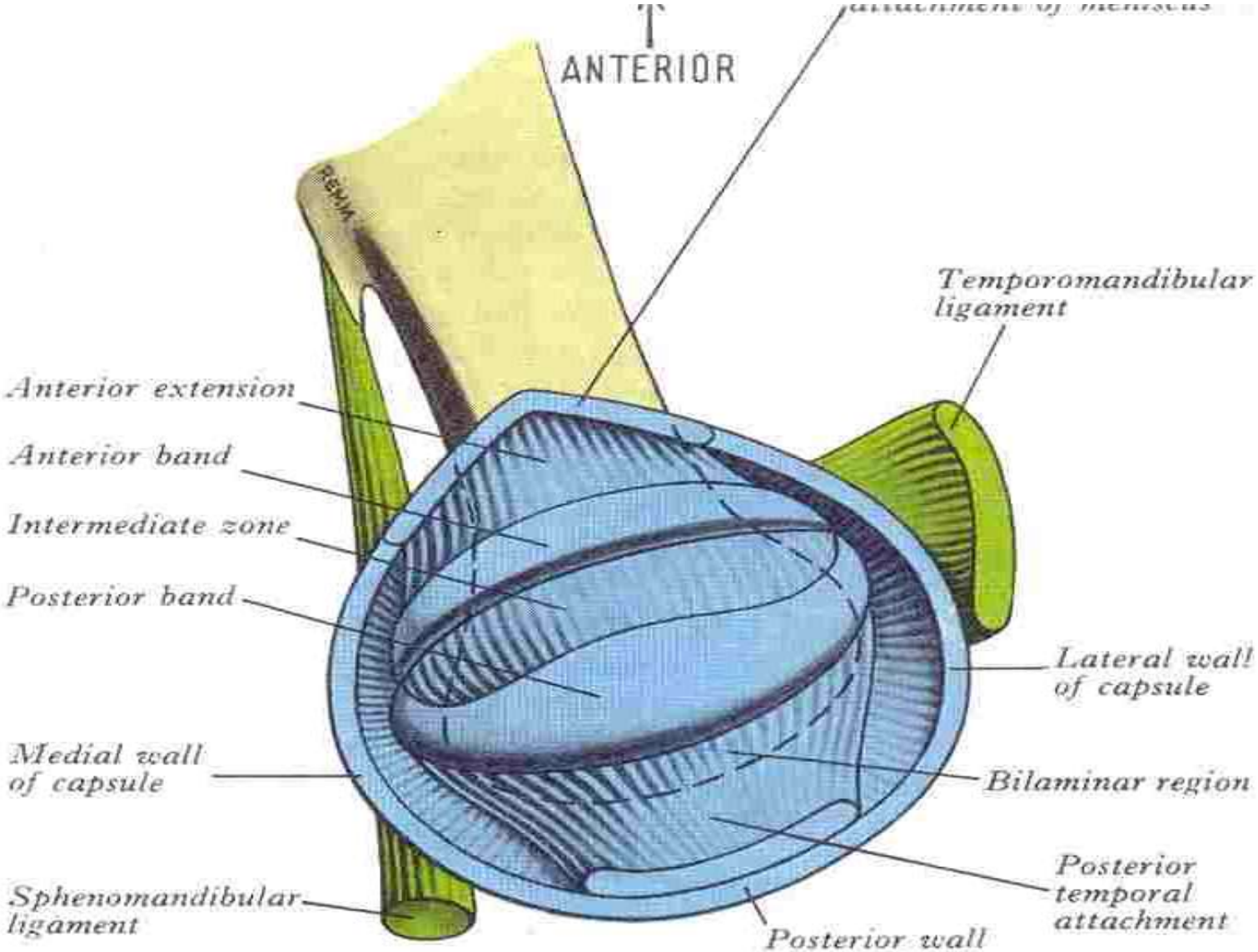

Fibrous capsule
mandibular ligament
enomandibular ligament
Mylohyoid groove

ARTICULAR DISC

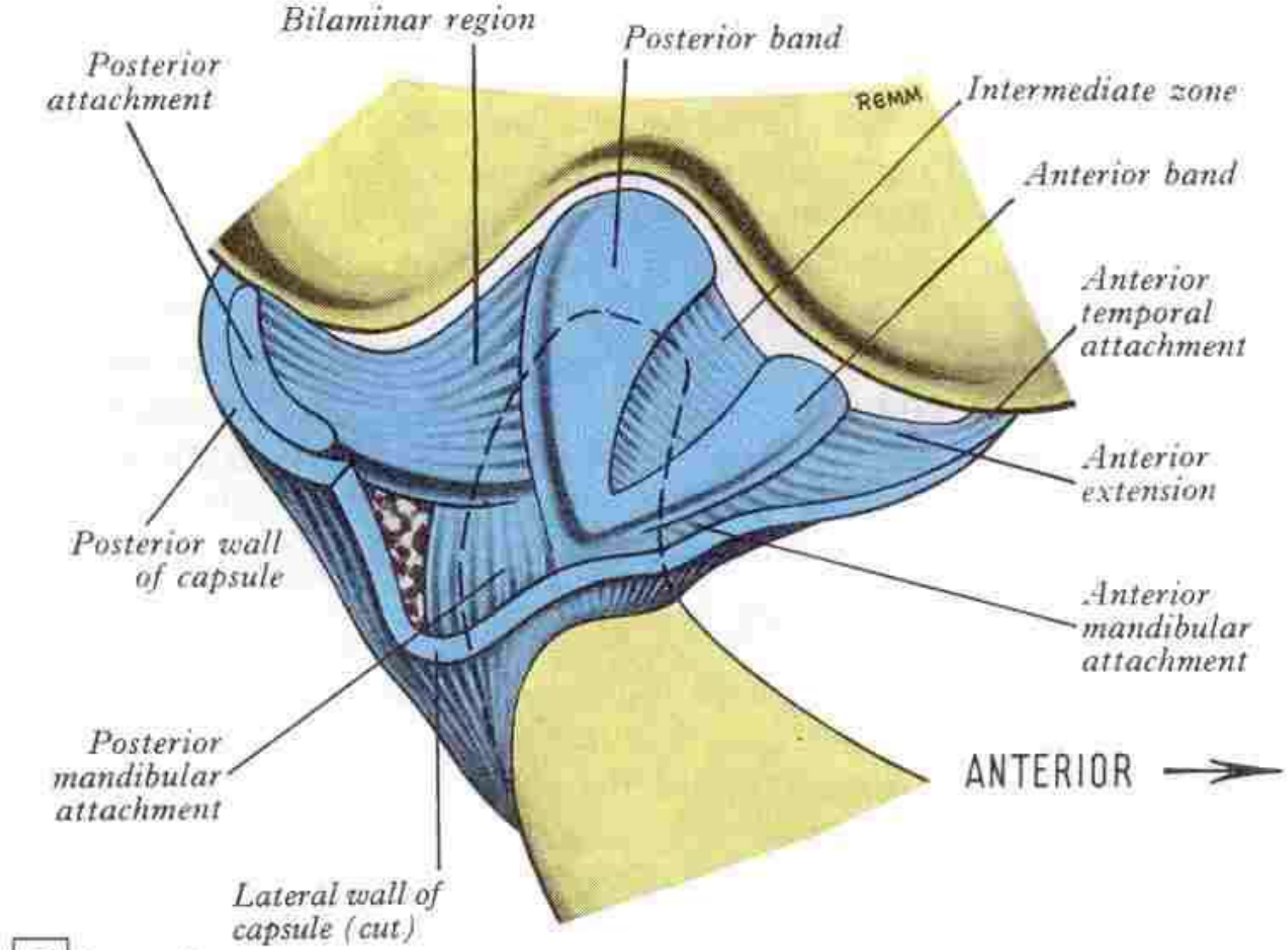
- Each TMJ is a double joint
- **Sagital section** * Thin intermediate zone
  * Thick anterior and posterior segment
- **Five zones** * Anterior extension
  * Anterior band
  * Intermediate Zone
  * Posterior extension
  * Posterior band



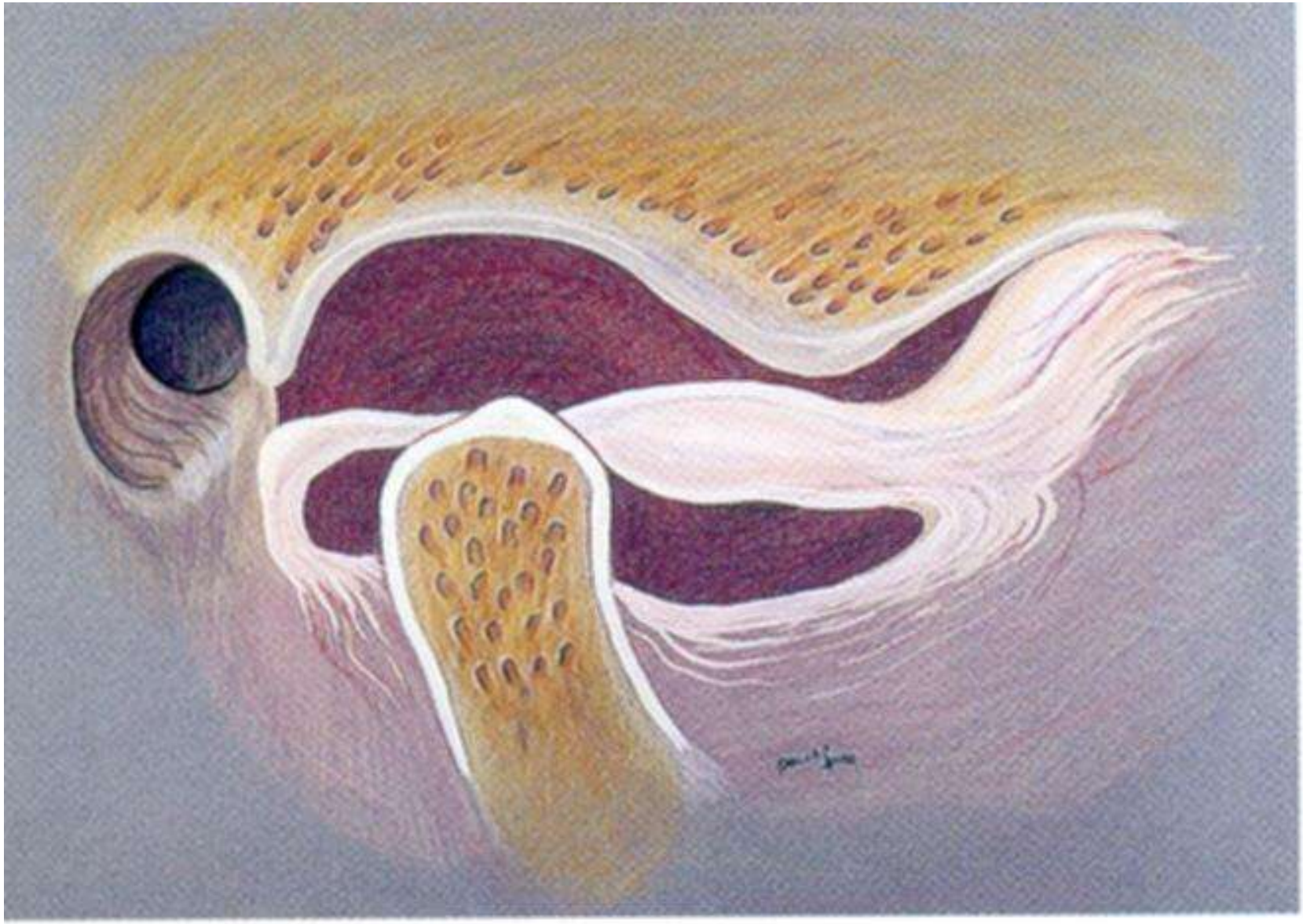
C In sagittal section.



A Superior aspect.

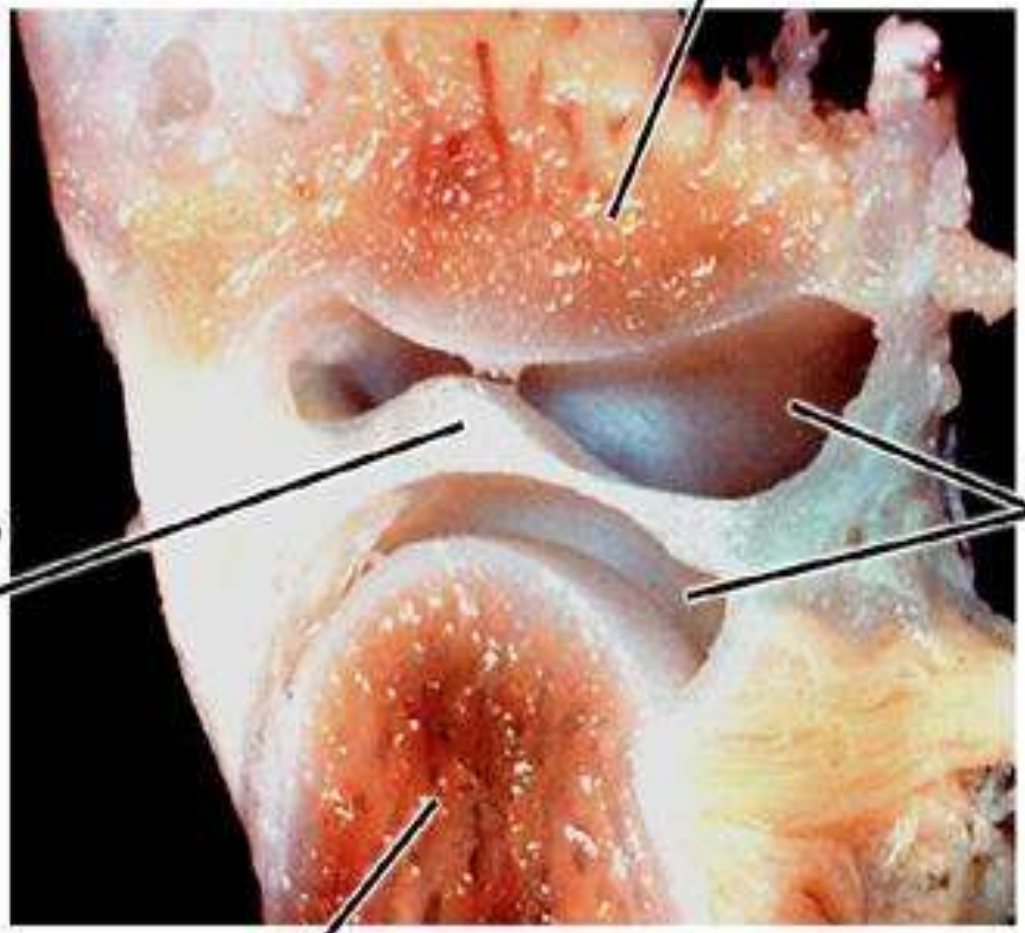


B Lateral aspect.



ARTICULAR CAPSULE

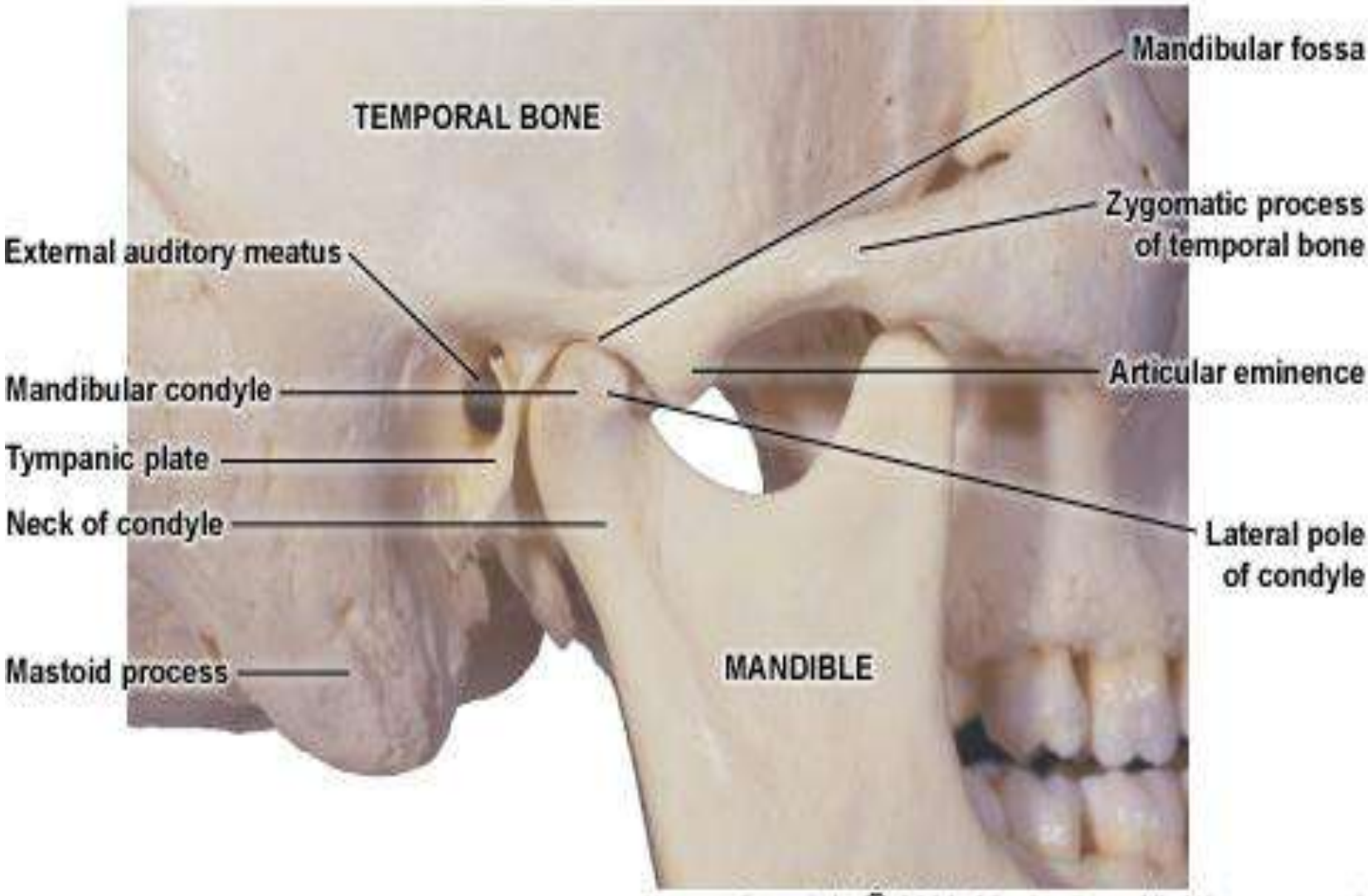
- Fibrous Connective Tissue
- Synovial membrane
- Synovial fluid



Articular Fossa

- Concavity within temporal bone that houses Mandibular condyle
- Anterior wall - Articular eminence
- Posterior wall - Tympanic plate

ANTERIOR



Temporomandibular joint disorders

Classificaton

1. Intra – articular origin or intrinsic disorders
2. Extra – articular origin or extrinsic disorders. Extrinsic factors are not directly due to TMJ but due to masticatory muscles and extrinsic trauma (traumatic arthrits, fracture, tendonitis)

TMJ disorders

1. Trauma
    1. Dislocation, subluxation
    2. Haemarthrosis
    3. Intracapsular #, extracapsular #
2. Internal disk displacement
    1. Anterior disk displacement with reduction
    2. Anterior disk displacement without reduction

3. Arthritis
    1. Osteoarthrosis (degenrative arthritis, osteoarthritis)
    2. Rheumatoid arthritis
    3. Juvenile rheumatoid
    4. Infectious arhtritis
4. Developmental defects
    1. Condylar agenesis or aplasia – uni \ bilateral
    2. Bifid condyle
    3. Condylar hypoplasia
    4. Condylar hyperplasia

5. Ankylosis
6. Neoplasms
    1. Benign tumors
        1. Osteoma
        2. Osteochondroma
    2. Malignant tumors
        1. Chondrosarcoma
        2. Fibrosarcoma
        3. synovialsarcoma

INTERNAL DERANGEMENT OF TEMPOROMANDIBULAR JOINT

- It is defined as malrelationship of meniscus to condylar head & articular eminence.

- These alterations allows meniscus to assume an abnormal position.

- Degenerative joint disease represents breakdown of articular surface layer.

• Derangement produces changes in smooth functioning of joint – associated with production of sound (clicking) & orofacial pain.

•This is termed as meniscus displacement or dislocation. Most common dislocation is in antero-medial direction.

ETIOLOGY

1. Macro-trauma to mandible

2. Micro-trauma to mandible from loss of posterior teeth lead to posterior displacement of condyle

3. Myofacial pain

PATHOPHYSIOLOGY

1. excessive mechanical loading of articular tissues limits:

   a)Cellular functions

   b) impairs fluid transport & produce free radicals in affected tissues leading to pathological state.

2. HYPOXIA PERFUSION INJURY: intracapsular hydrostatic pressure exceeds the end capillary perfusion pressure, and blood flow is transiently disrupted resulting in tissue hypoxia responsible for heightened muscular tension & bruxism. This leads to altered metabolic response of the affected tissues.

3. NEUORGENIC INFLAMMATION: substance – P, Calcitonin, substance – Y found in TMJ spaces released from peripheral nerve terminals are responsible for proinflammatory response in articular space producing pain.

All the 3 mechanisms are involved in degenerative process of TMJ.

CLINICAL DIAGNOSIS

1. HISTORY
    1. Pain
    2. Joint sound / clicking
    3. Occlusal disharmony
    4. History of any previous treatment – (restoration, extraction, fixed prosthesis)
    5. Psychological background of the patient

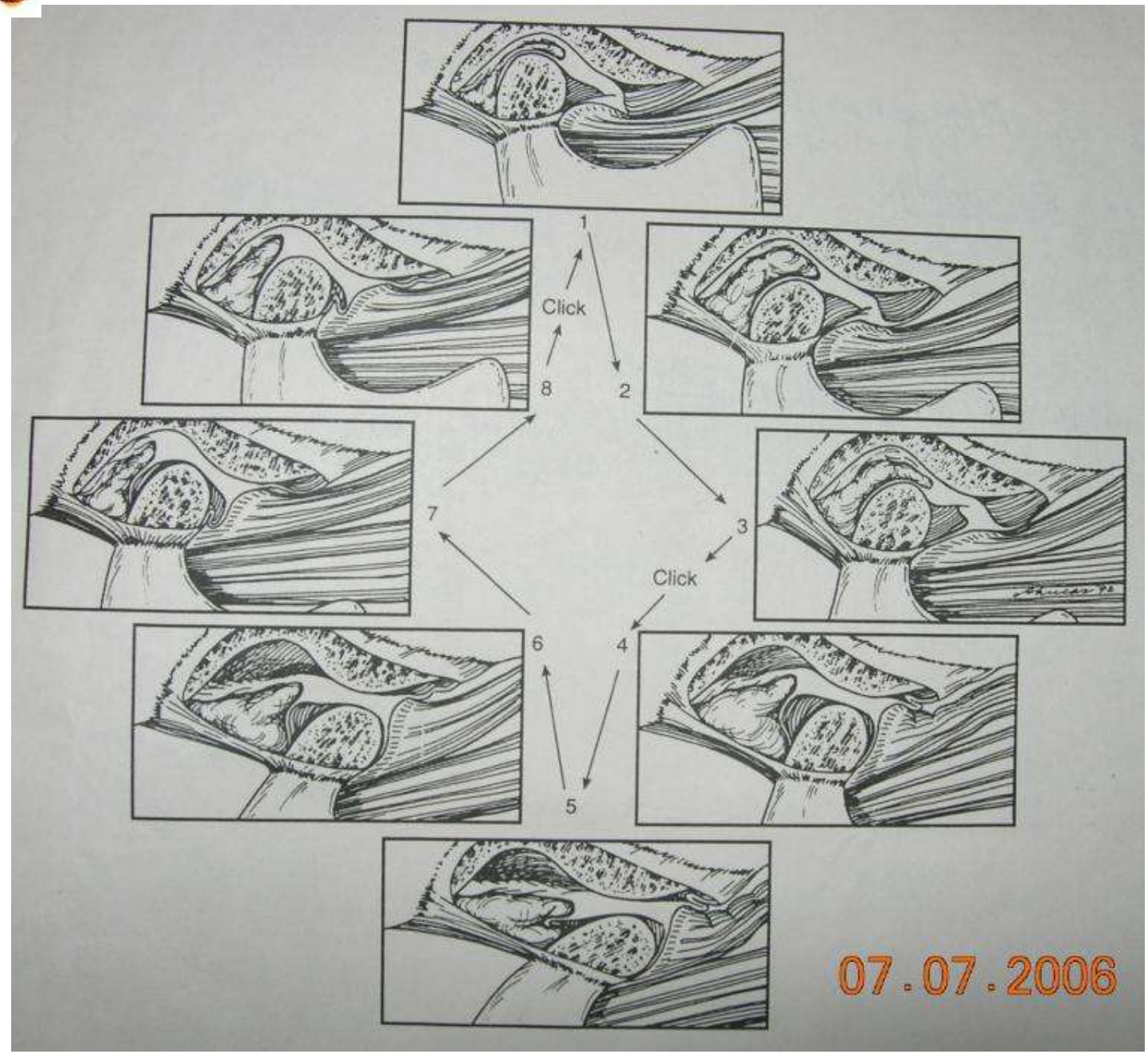
SPECIAL INVESTIGATIONS

1. Plain radiographs (transcranial – osteoarthritic changes
2. Arthrography – soft tissue (perforation & adhesions of meniscus)
3. C.T. scan – less accurate for TMJ
4. MRI – non invasive technique for soft tissues of joint
5. Arthroscopy – latest least invasive – arthrocentesis can be done
6. Acosutic evaluation (intensity & character of clicking)

Clinically internal derangements can be distinguished in 3 stages:

1. Initial stage: anterior displacement of disk with reduction
2. Intermediate stage : anterior displacement of disc without reduction
3. Terminal stage : anterior displacement of disc with perforation of disc

FUNCTIONAL DISLOCATION OF THE DISC WITH REDUCTION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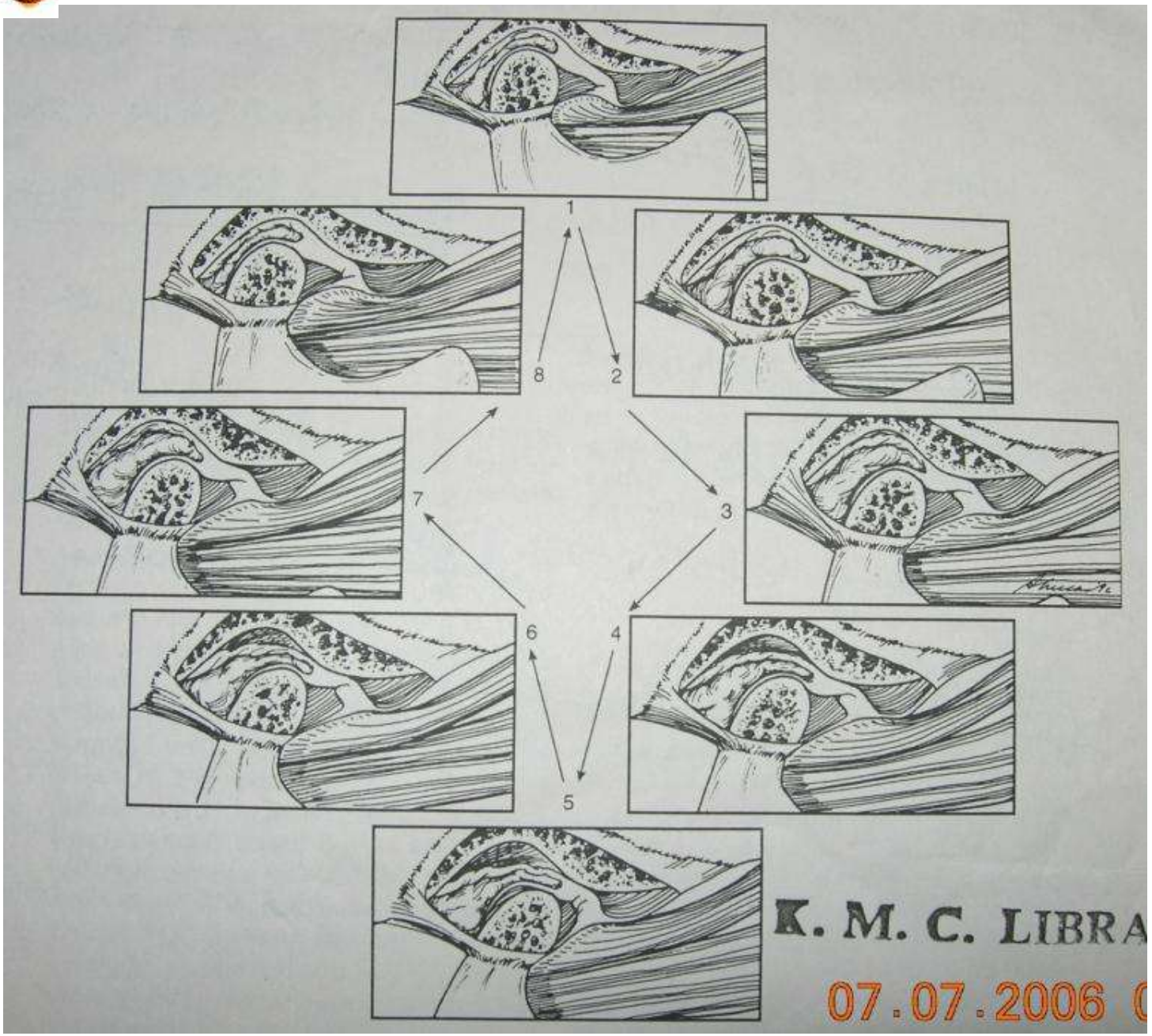
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WILKE'S STAGING CLASSIFICATION FOR INTERNAL DERANGEMENT OF TMJ

1. Early stage
    1. Clinical : no significant mechanical symptoms other than reciprocal clicking; no pain or limitation of motion
    2. Radiologic : slight forward displacement; good anatomic contour of the disc; negative tomograms
    3. Anatomic / pathologic : excellent anatomic form; slight anterior displacement; passive incoordination demonstrable.

2. Early / Intermediate stage

1. Clinical : one or more episodes of pain; beginning major mechanical problems consisting of mid to late opening; loud clicking; transient catching and locking

2. Radiologic : slight forward displacement; beginning disc deformity of slight thickening of posterior edge; negative tomograms

3. Anatomic / pathologic : anterior disc displacemet; early anatomic disc deformity; good central articulating area

3. Intermediate stage:

   1. Clinical: multiple episodes of pain; major mechanical symptoms consisting of locking (intermittent or fully closed, restriction of motion and difficulty with function)

   2. Radiological : anterior disc displacement with significant disc deformtiy / prolapse of disc (increased thickening of posterior edge); negative tomograms.

   3. Anatomic / pathologic : marked anatomic disc deformity with anterior displacement; no hard tissue changes.

4. Intermediate / late stage:

1. Clinical : slight increase in severity over intermediate stage
2. Radiologic: slight increase in severity over intermediate stage, positive tomograms showing early to moderate degenerative changes – flattening of eminence; deformed condylar head; sclerosis
3. Anatomic / pathologic : increase in severity over intermediate stage; hard tissue degenrative remodelling of both bearing surfaces (osteophytosis) multiple adhesions in anterior and psoterior recesses; no perforation of disc or attachments.

4. Late Stage:

    1. Clinical : characterized by crepitus; variable and episodic pain; chronic restriction of motion; difficulty with function

    2. Radiologic : disc or attachment perforation; gross anatomic deformity of disk and hard tissues; positive tomograms with essentially degenerative arthritic changes

    3. Anatomic / pathologic : gross degenerative changes of disc and hard tissues; perforation of posterior attachment; multiple adhesions; osteophytosis; flattening of condyle & eminence; subcortical cystic formation.

MANAGEMENT

Initial Treatment:

AIM: to bring the joint back to healthy normal position

Conservative treatment:

1. relieving the joint from trauma by changing diet (soft & smaller food)

2. Avoidance of empty chewing (gums, bruxism)

3. Medications (NSAIDS)

4. Muscle spasm is another component – muscle relaxants (Diazepam)

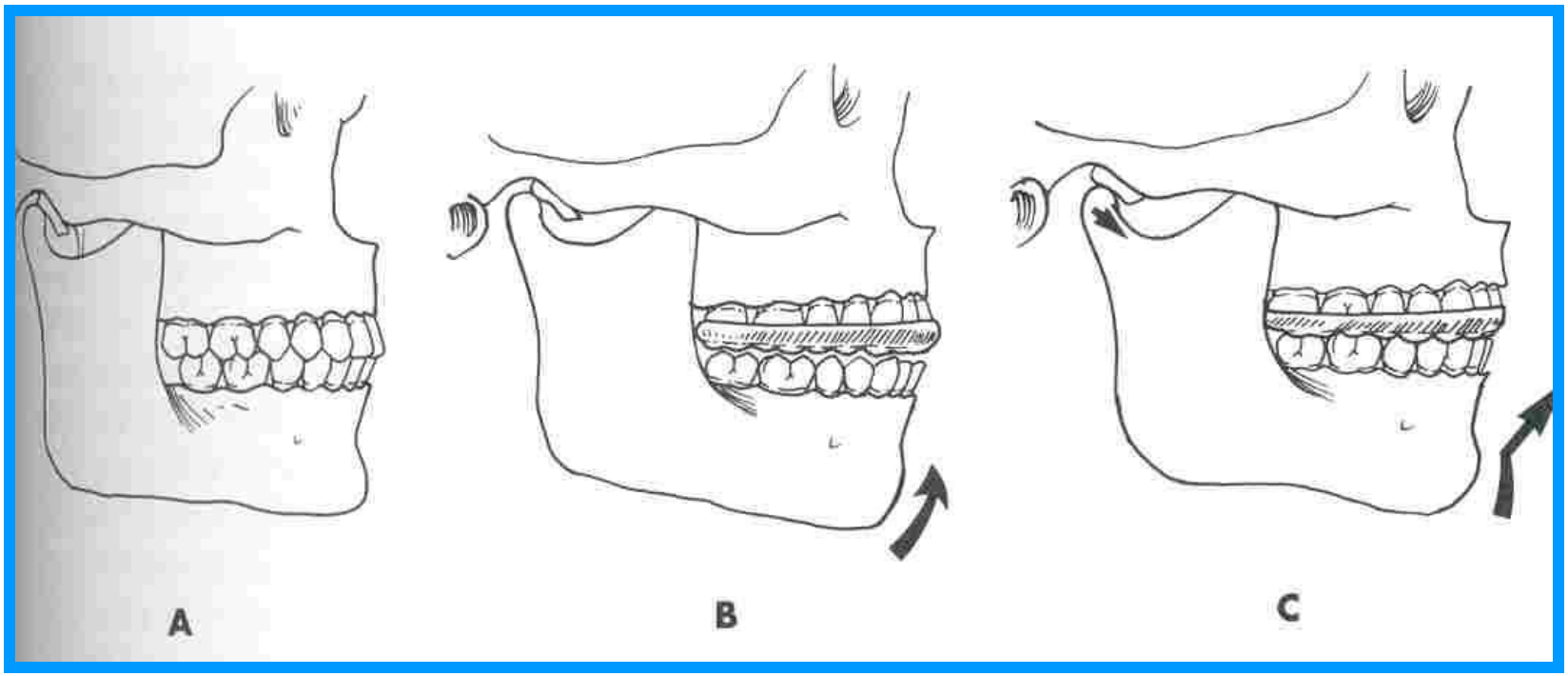
5. Intra-articular injection of Triamcinolone, Placentral extract, Hydrocortisone, Hyaluronidase provides quick relief

6. New drug trials : Glucosamine & Chondrotin sulfate as a synovial fluid component replacement.

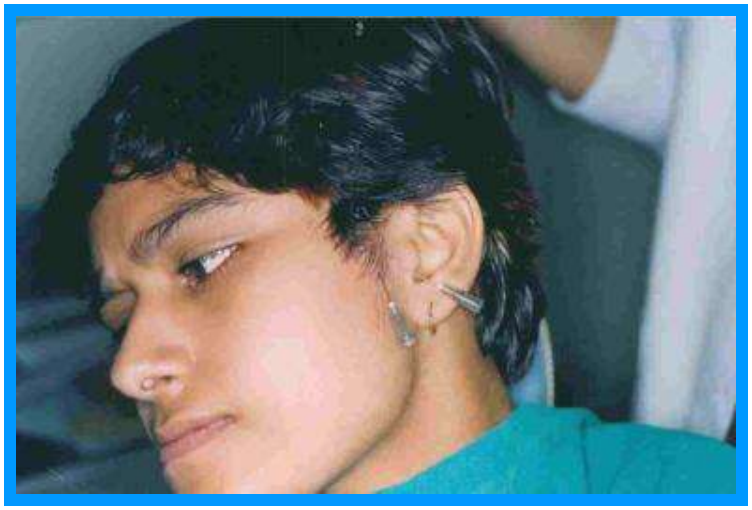
7. Supportive therapy :

1. Appliance
    1. Stabilization splint
    2. Repositioning splint
2. Physiotherapy
    1. Joint mobilization
    2. Movement education

FARAR'S APPLIANCE

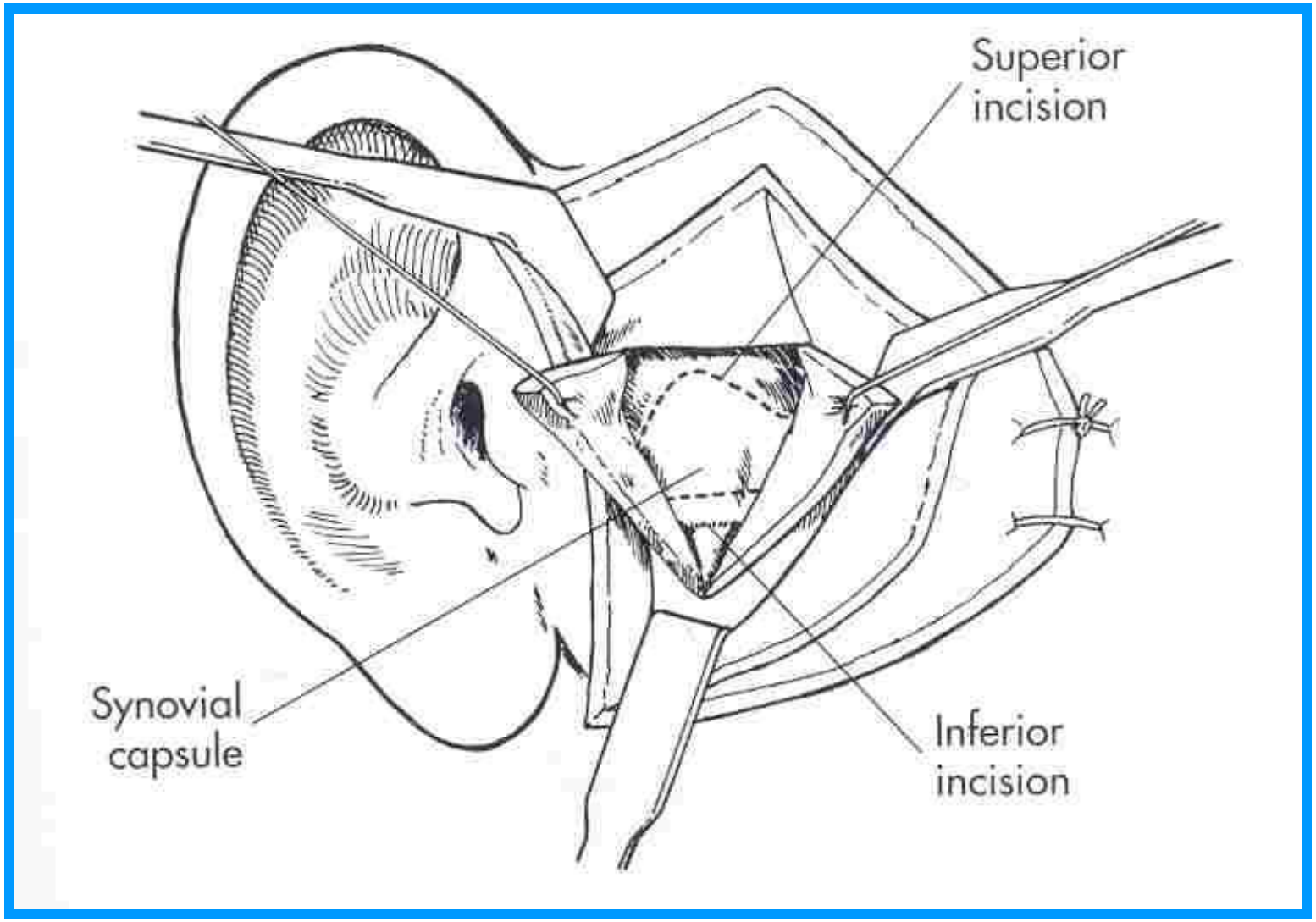


ARTHROCENTESIS



9. Surgical management

a. MENISCECTOMY



- *MENISCECTOMY WITH REPLACEMENT*

-SILICON IMPLANT

-AURICULAR CARTILAGE

-DERMIS GRAFT

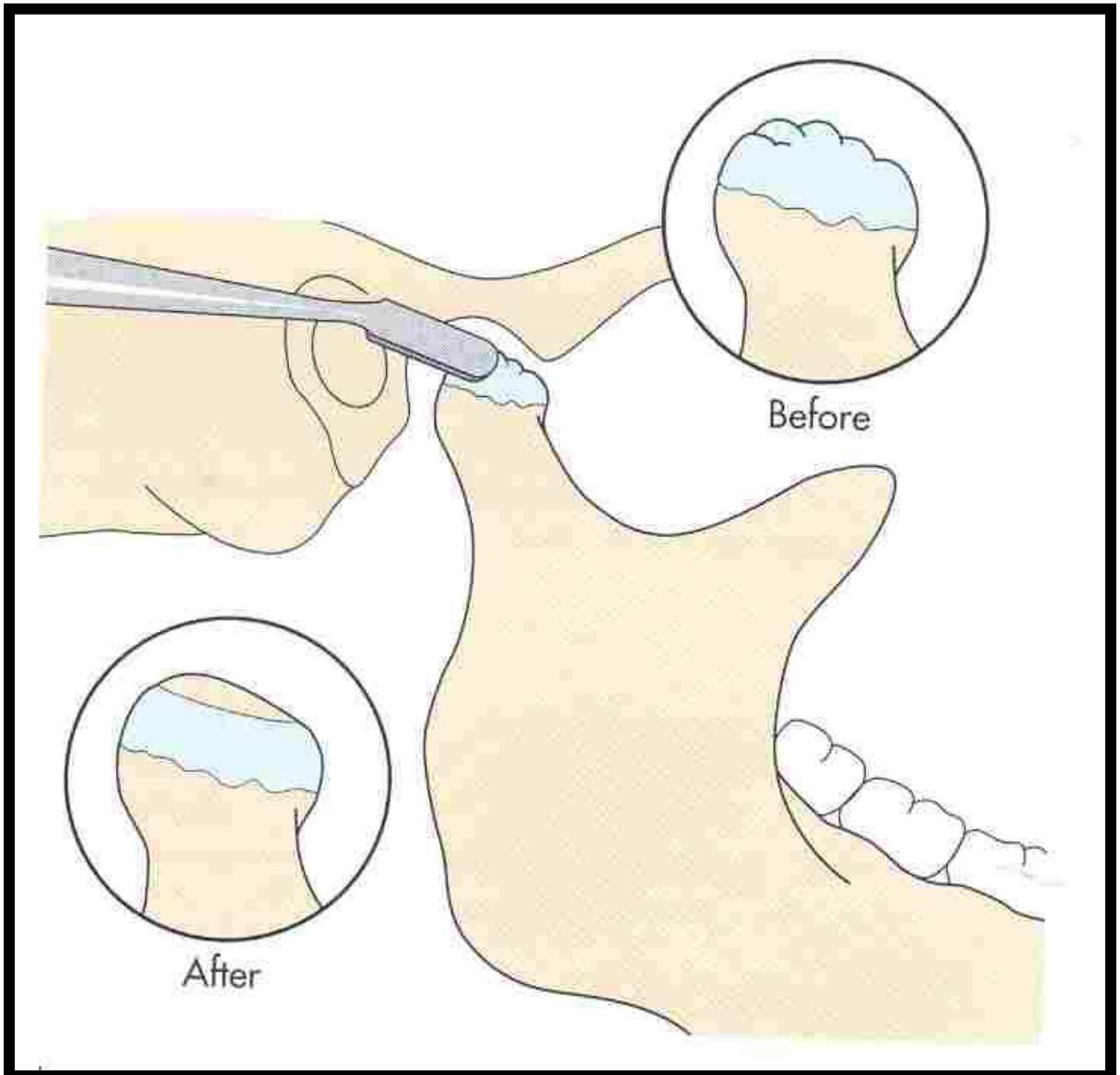
-TEPORALIS FASCIA GRAFT

-FRESH FROZEN FEMORAL HEAD CARTILAGE

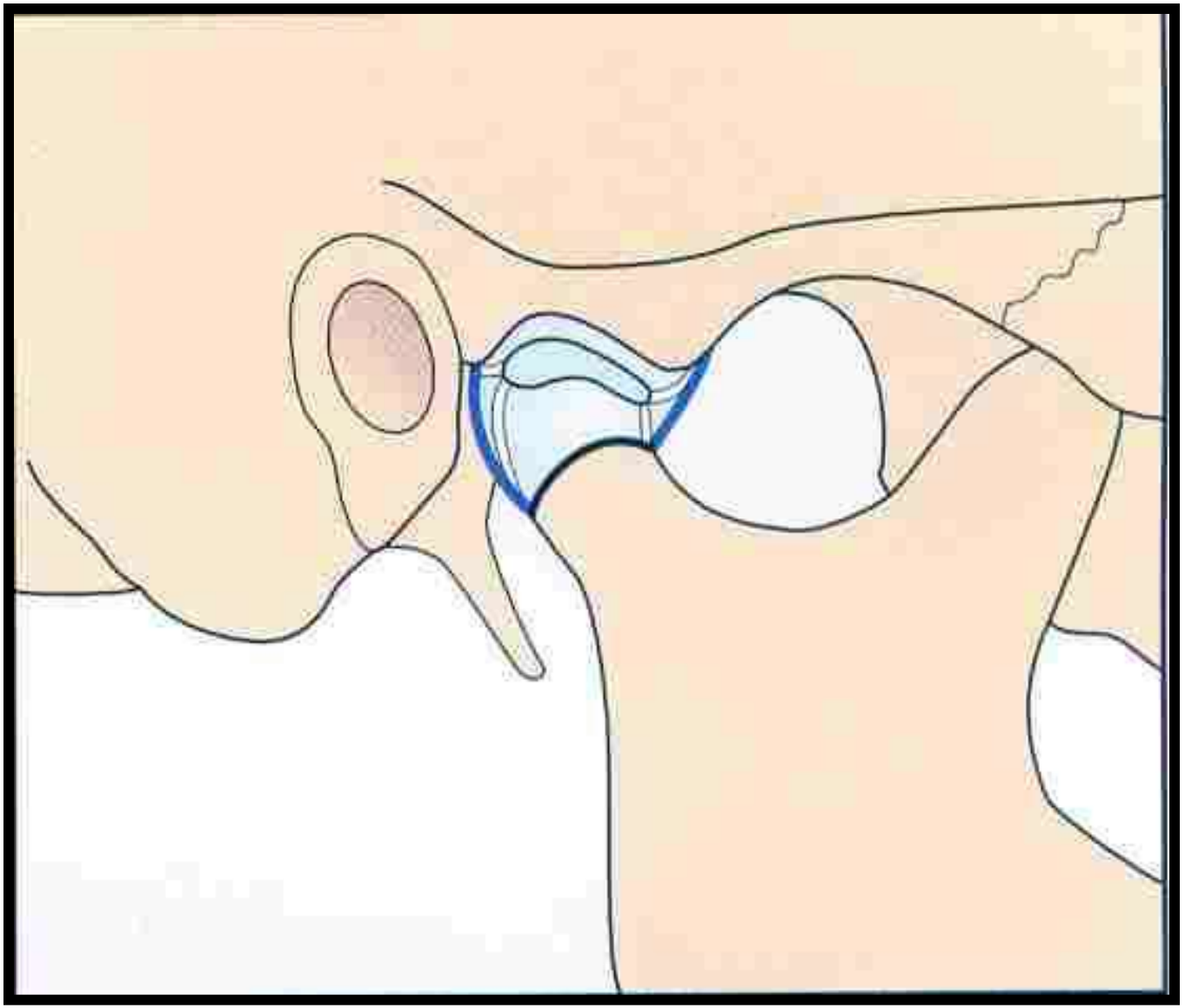

POREX
MEDICAL
FAIRBURN, GA


POREX
MEDICAL

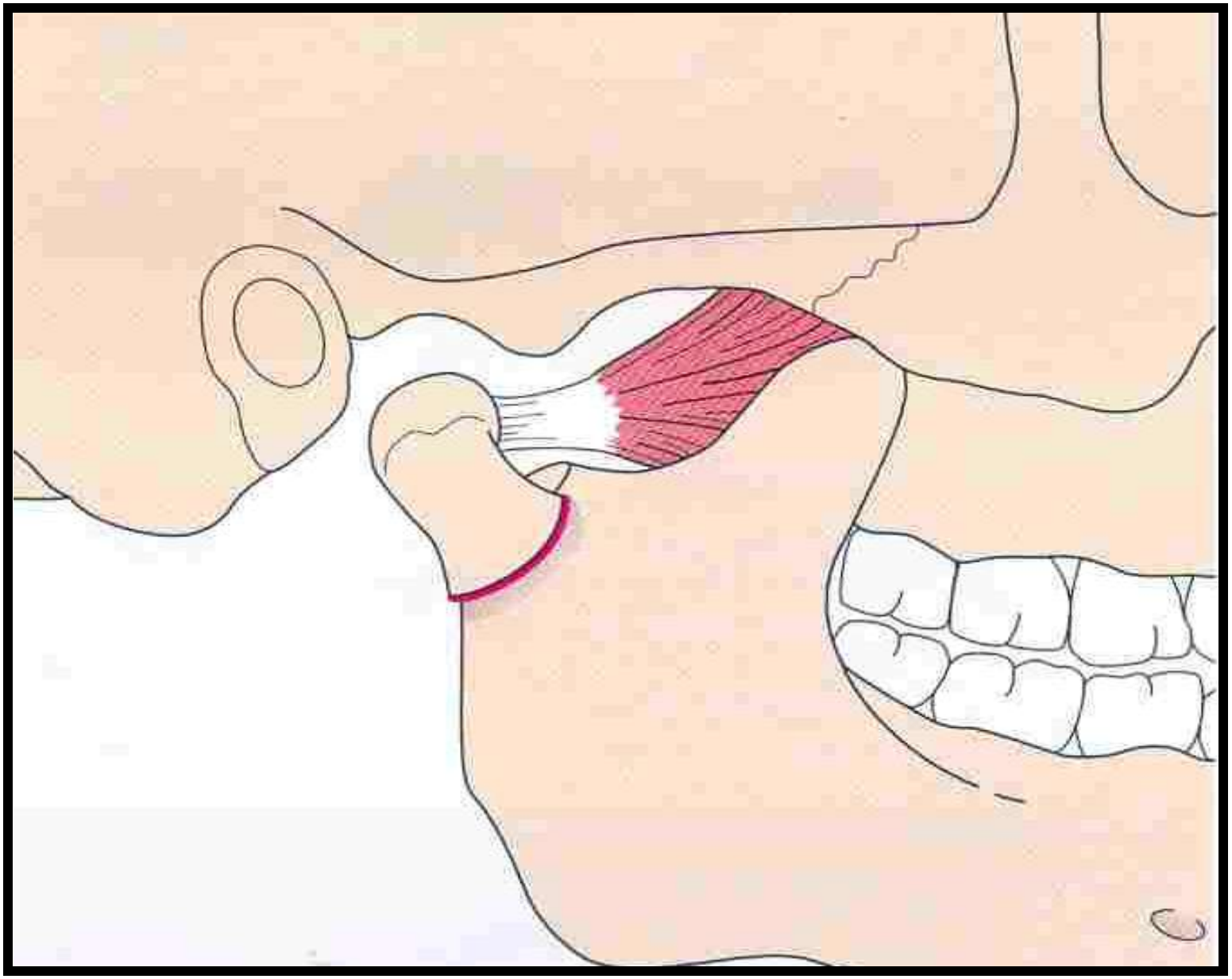
HIGH CONDYLECTOMY OR CONDYLOPLASTY



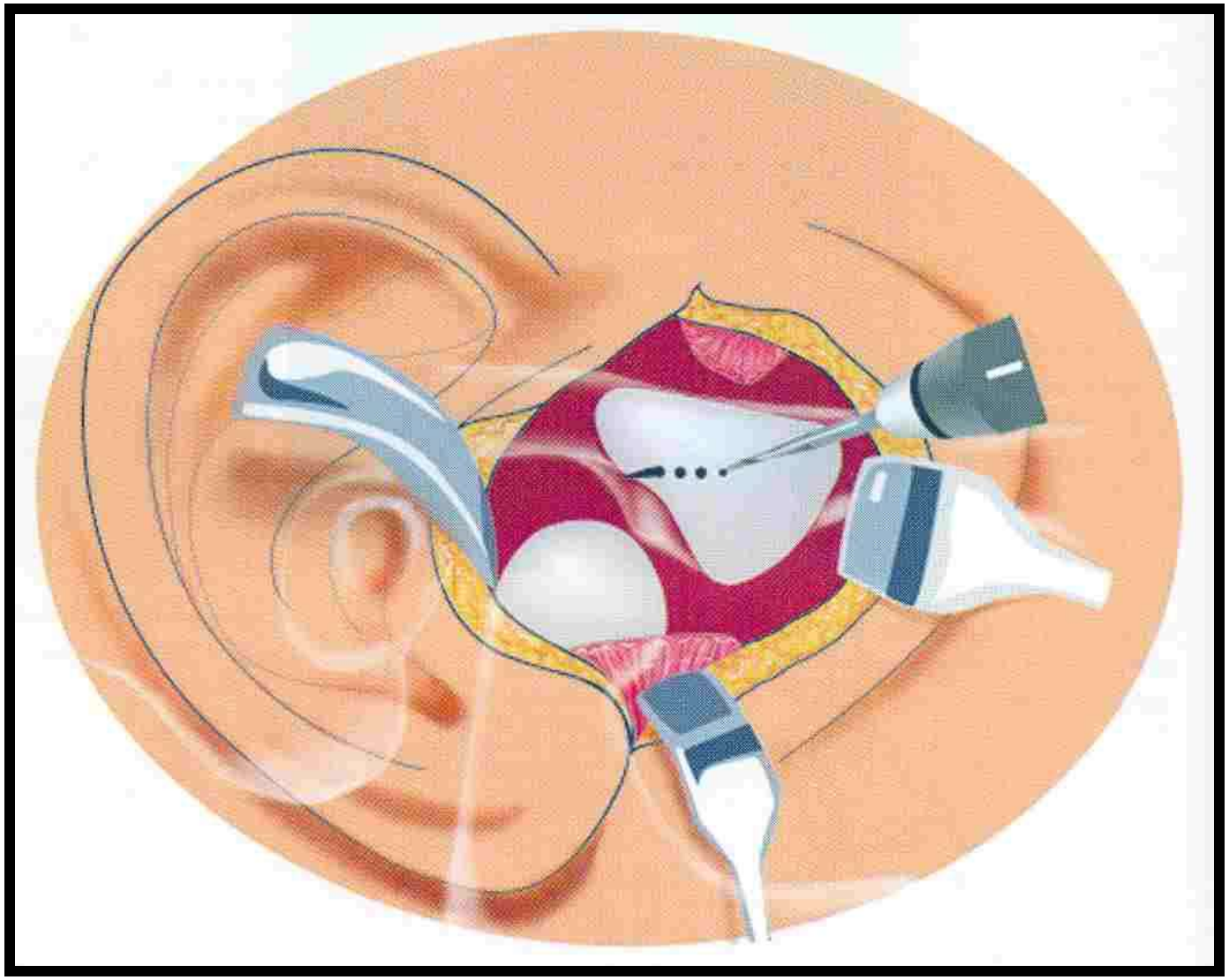
c. Condylectomy



d. Condylotomy



e. EMINECTOMY



f. Shortening of temporalis tendon

g. Temporalis fascia sling

h. Plication of capsule

MYOFACIAL PAIN DYSFUNCTION SYNDROME

Myofacial pain is a regional muscle pain disorder characterized by localised tenderness in taut muscle bands and referred pain. MPDS is a cause of pain in 55.4% of the head and neck pain and 85% of the back pain.

- According to the epidemological survey young woman 20 to 40 yrs revealed that MPDS occur in about 30% of general population.

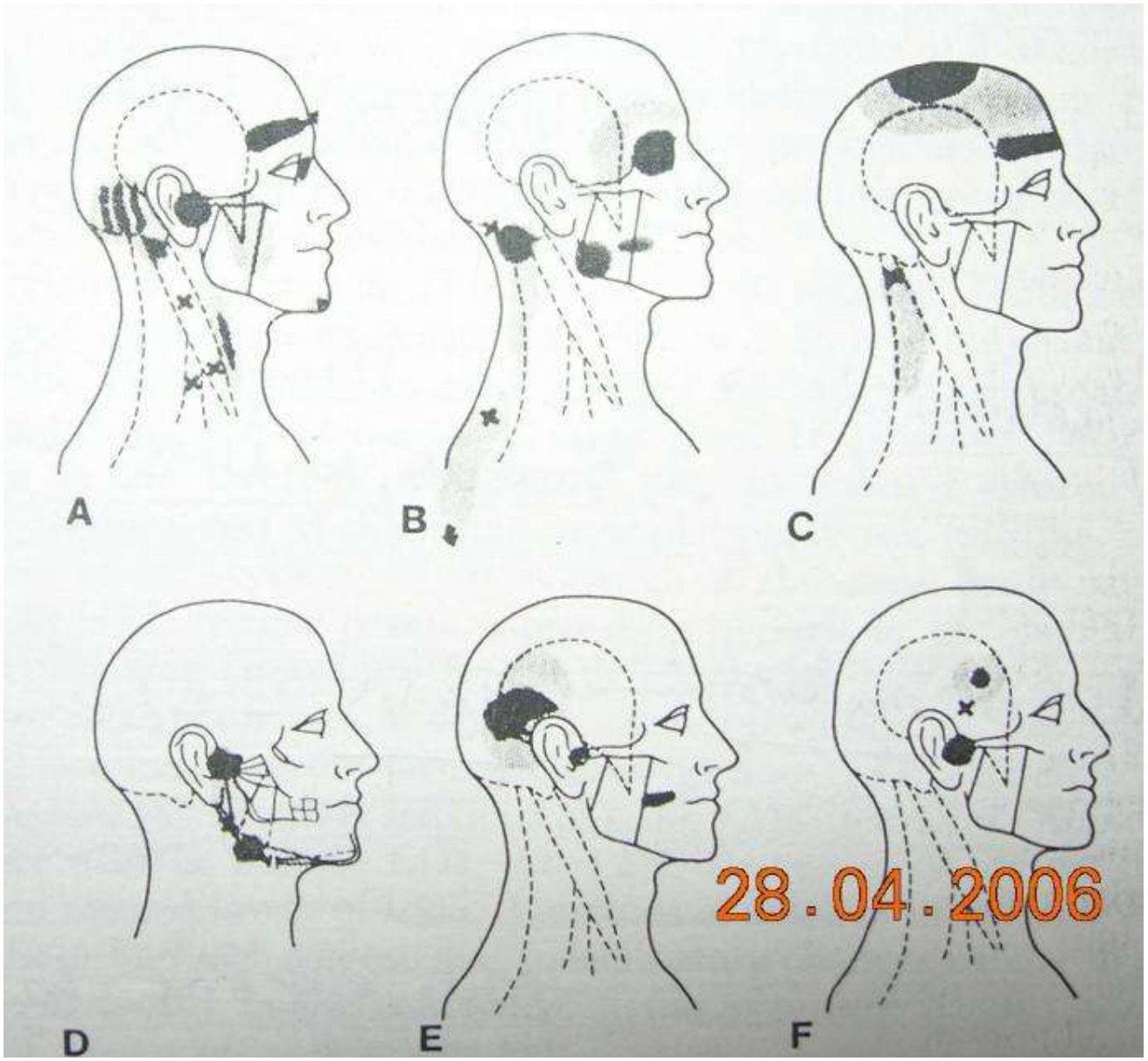
Characteristic clinical features:

• Trigger points – 2 to 5 mm in diameter and are found within hard palpable bands of skeletal muscle.

• Localised deep tenderness in a taut band of skeletal muscle, that is responsible for the pain in zone of reference and if treated will dissolve the pain.

TRIGGER POINT IN FIBROMYALGIA

TRIGGER POINT



• According to Psychophysiologic theory, TMJ pain is a misnomer, main pain occurs in muscles therefore the term MPDS.

•Unilateral dull pain in ear and preauricular region worsen on awakening.

• Tenderness on one of the muscles of mastication.

• Clicking or poping noise from TMJ.

• Limitation or deviation of the mandible.

• In this theory no primary change in the TMJ only secondary changes occur due to the MPDS.

• Basic pathophysiology of MPDS is stress – clinching and grinding – muscle fatigue – spasm - pain – stress.

•In this there is high level of endogenous catecholamines.

Contributing factor for MPDS:-

1. Physical disorders
2. Parafunctional habits
3. Postural strains
4. Disuse
5. Nutritional factors
6. Sleep disturbances
7. Stress

- Additional signs and symptoms:

1. Neurological

    - Tingling
    - Numbness
    - Blurred vision
    - Excessive lacrimation

2. GIT symptoms
    - Nausea
    - Vomiting
    - Indigestion
    - Constipation
    - Diarrhea
3. Musculoskeletal
    - Fatigue, tension, stiff joint, swelling

4. Otological

- Tinnitus
- Ear pain
- Dizziness
- Diminished hearing

Management & Treatment

A. Physiological management - Spray & stretch – stimulate rhythmic muscle movements, which leads to fasciculation of muscle and increases circulation, decrease the edema and resting muscle activity.

2. Pharmacological Treatment – NSAID's , Diazepam, anti depressants
3. Psychological – by placebo and hypnosis
4. By nerve stimulation – TENS
5. By bio-feed back therapy
6. Occlusal splint – helpful in case of bruxism and prevent the changes in TMJ.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Causes of Trismus

1. Due to infection
2. Trauma - # zygomatic arch, condylar process, trauma to medial pterygoid muscle during IAN block.
3. Inflammation – myositis or muscular atrophy
4. Tetany – hypocalcaemia – carp pedal spasm along with trismus
5. Tetanus
6. Neurological disorders – epilepsy, brain tumor, embolic haemorrhage in medulla

7. Psychosomatic trismus
8. Drug induced trismus
9. Mechanical blockage – exostosis, osteoma of coronoid process
10. Extraarticular fibrosis – OSMF, Irradiation therapy, bands of scars and burns.

TMJ

ANKYLOSIS

Introduction

***Ankylosis*: Greek- "Stiff Joint"**

Definition:

- An inability to open the mouth due to either a bony or fibrous union between the head of the condyle and the glenoid fossa.
- **Xing Long et al (2005):**

An intracapsular union of the disc condyle complex to the temporal articular surface that restricts mandibular movements, including fibrous adhesions or bony fusion between condyle, disc, glenoid fossa and eminence

Difference between young & adult condyle

YOUNG CONDYLE

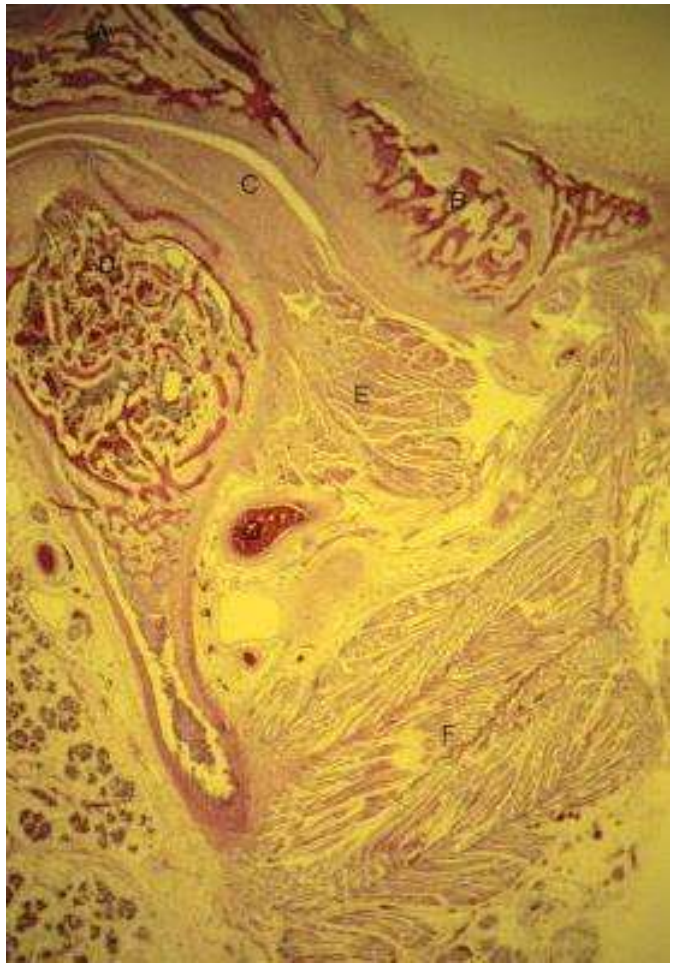
- Condylar head more vascular
- Neck thinner
- Bone is soft & pliable
- Cartilage is predominant in the child

ADULT CONDYLE

- Less vascular
- Neck is thicker
- Bone is less pliable
- Fibrous tissue predominant

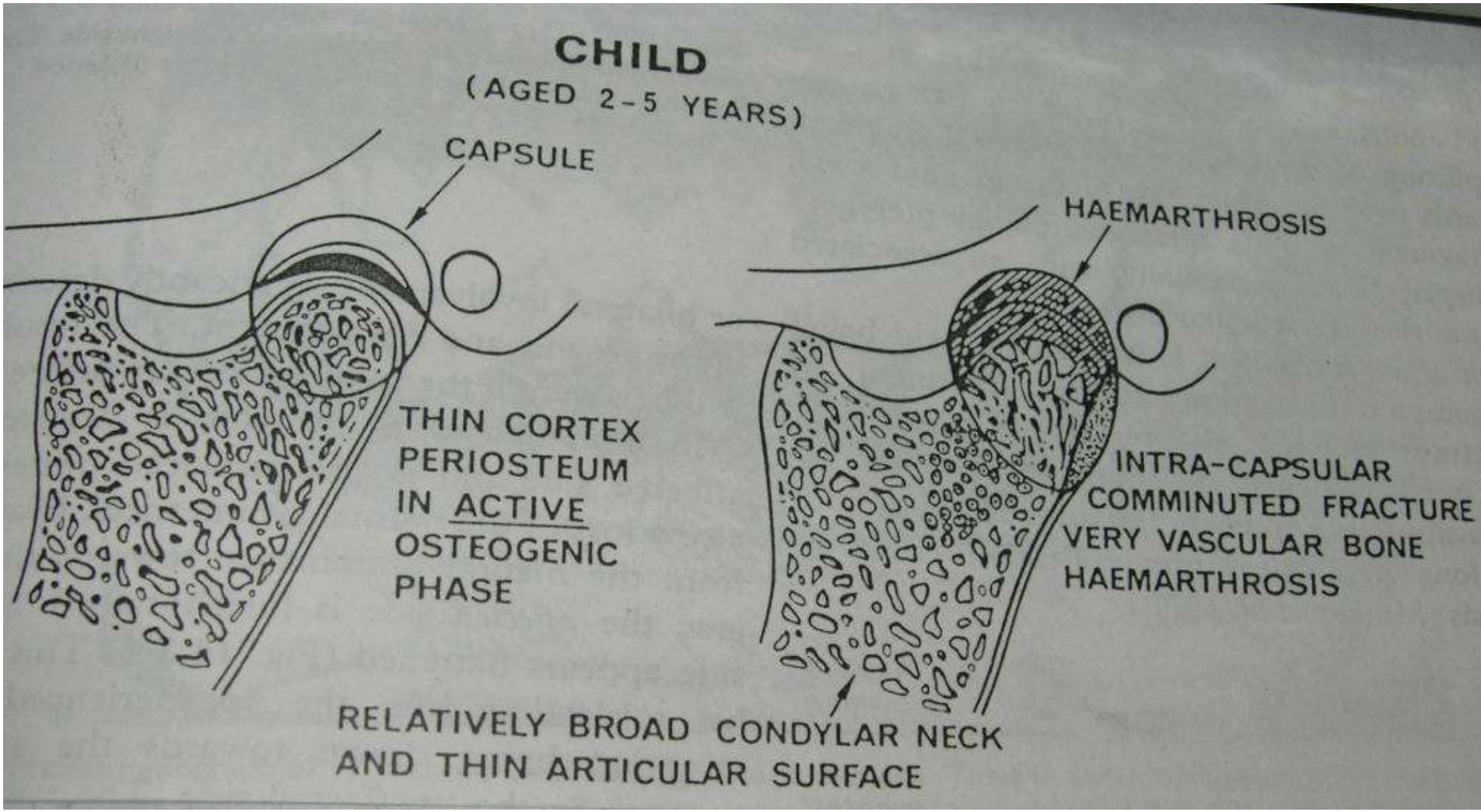
Aetiology

- **Trauma** – forceps delivery & fracture of condylar head
- **Infection** – mastoiditis/otitis media
- **Temporal bone/condylar osteomyelitis**
- **Ankylosing spondylitis**
- **Rheumatoid arthritis**
- **Metastatic neoplasms**
- **Parotid abscesses**
- **Exanthematous diseases**
  - eg measles



Pathogenesis

- Fracture of condylar head and disruption of articular disc
- Haemarthrosis
- Restriction of mouth opening due to pain or treatment by prolonged IMF
- Organization of haemarthrosis
- New bone formation
- Fusion of joint components - ANKYLOSIS


CHILD
(AGED 2-5 YEARS)
CAPSULE
HAEMARTHROSIS
THIN CORTEX
PERIOSTEUM
IN ACTIVE
OSTEOGENIC
PHASE
INTRA-CAPSULAR
COMMINUTED FRACTURE
VERY VASCULAR BONE
HAEMARTHROSIS
RELATIVELY BROAD CONDYLAR NECK
AND THIN ARTICULAR SURFACE

Classification of TMJ ankylosis

A. **According to location**

i. Intra-articular

ii. Extra-articular

B. **Types of tissue involved**

i. bony

ii. fibrous

iii. fibro-osseous

C. Extent of fusion

i. complete

ii. incomplete

D.According to site

i. Unilateral

ii. Bilateral

E. According to anatomical borders of ankylotic mass & extent of articular & skull base

- Class I - ankylotic bony mass limited to condylar process and articular fossa
- Class II – bone mass extends out of fossa involving the medial aspect of skull base upto carotid – juglar vessels
- Class III – extension & penetration into middle cranial fossa
- Class IV – combination of class II & III

Grading of TMJ ankylosis (Sawhney 1986)

- ***Type I*** – the condylar head is present without much distortion. Fibrous adhesions make movement impossible.
- ***Type II*** – bony fusion of the misshaped head and the articular surface. No involvement of sigmoid notch and coronoid process.
- ***Type III*** – a bony block bridging across the ramus and the zygomatic arch. Medially an atrophic dislocated fragment of the former head of the condyle is still found. Elongation of the coronoid process is seen
- ***Type IV*** – normal anatomy is completely distorted. Complete bony union between the ramus and skull base

CLINICAL FEATURES

Unilateral ankylosis

Clinical Presentation

- Inability to open mouth can be partial or complete
- Facial asymmetry in long standing cases
  - in bilateral cases – bird facies, retrognathia
  - in unilateral cases – chin deviation & shortening of ramus – ipsilateral side & on normal side flattening of face.
- Deranged occlusion
- Retarded growth
- Prominent antigonial notch
- In retrognathic mandible – submental hump

Bilateral ankylosis

The Classical Bird Face Deformity

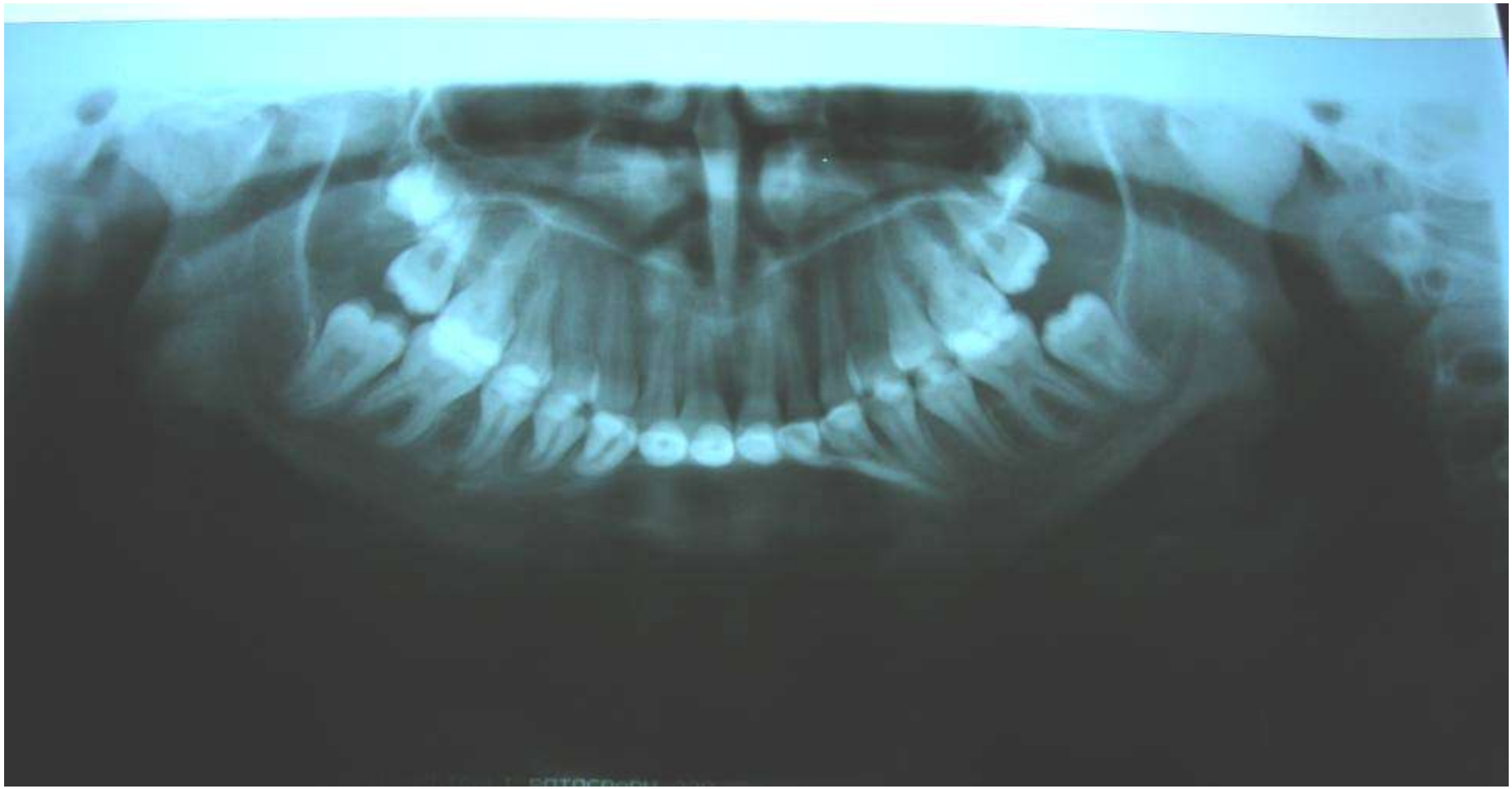
Functional Impairment

- Impaired speech
- Difficulty in mastication: malnutrition
- Poor oral hygiene and rampant caries
- Disturbed growth of the mandible and the face
- Possibility of airway compromize

Radiographic Features

Unilateral ankylosis

Bilateral ankylosis



Treatment

Restoration of Function and Esthetics Is the Primary Aim of Treatment.

The condyle is ***not a major growth centre***.

The mandible grows in response to functional stimulation and therefore restoration of function as early as possible is imperative.

Treatment Planning

1. **CHILD without mandibular retardation (Restoration of function alone)**

2. **CHILD with mandibular retardation (Restoration of function + c.c. graft)**

3. **ADULT with mandibular retardation (Restoration of function + Reconstruction)**

Restoration of Function

- Forcible mouth opening for fibrous ankylosis – brisment forces
- Surgical release

1. **Condylotomy/Condylectomy**
2. **Gap Arthroplasty**
3. **Interpositional Arthroplasty**

- Vigorous post-operative physiotherapy

Objectives of Surgery

- *Permanent* release of ankylosis
- Creation of a normal, functional joint
- Provision for the correction of any associated facial deformity
- To restore the normal facial growth in children

KABAN'S PROTOCOL

- aggressive ressection of ankylotic mass – 1.5cm gap
- ipsilateral coronoidectomy
- contralateral coronoidectomy
- lining of joint with temporalis fascia or muscle
- reconstruction of ramus with costochondral graft
- rigid fixation of gaft
- early mobilization and aggressive physiotherapy

Anesthetic Considerations

- Restricted mouth opening
- Distorted upper airway anatomy
- Prolonged anaesthesia usually required
- Methods and techniques :
  - Fibro-optic intubation
  - Tracheostomy
  - “Blind” intubation

SURGICAL APPROACHES TO TMJ

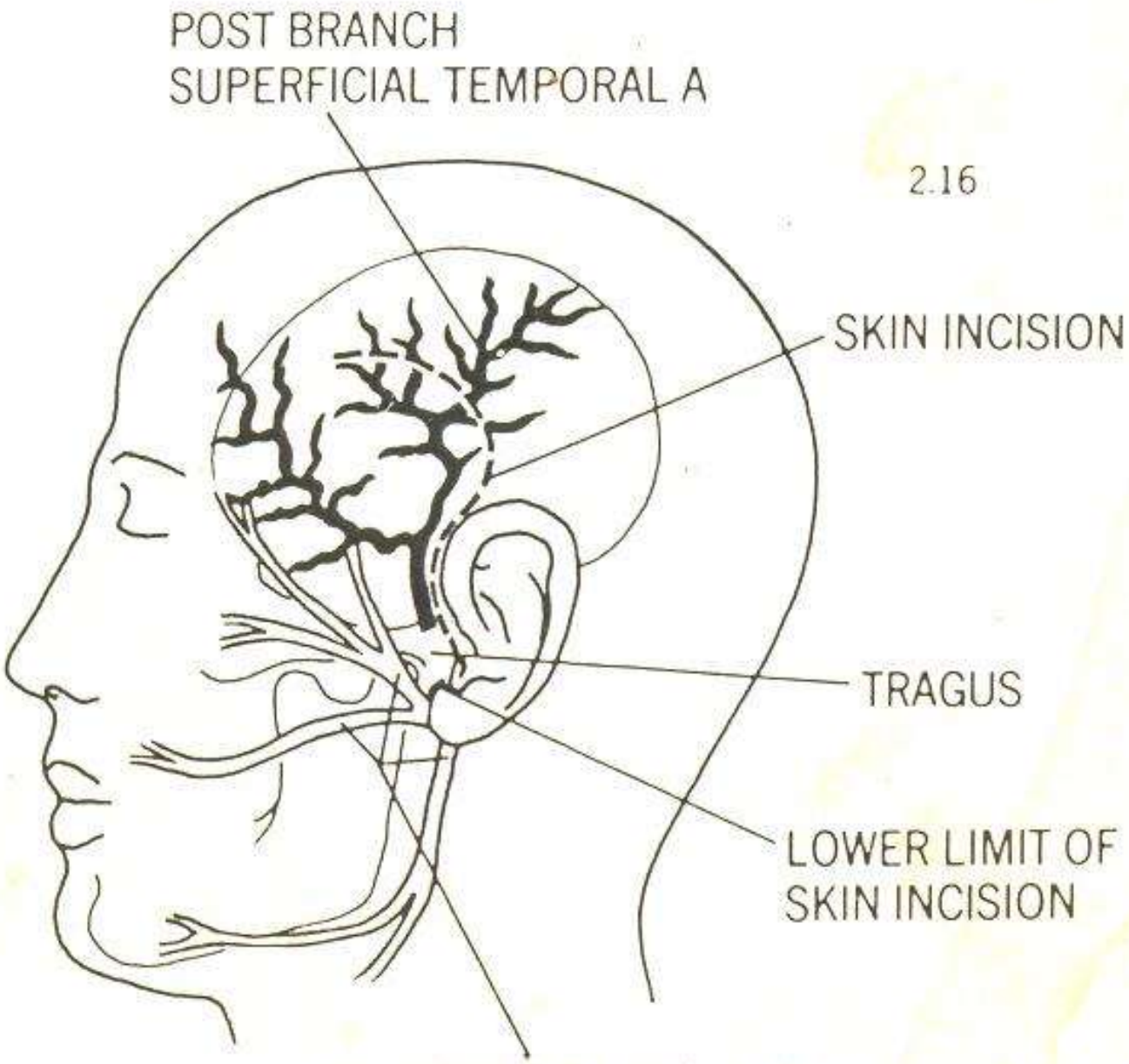
- **PREAURICULAR**
- **ENDAURAL**
- **SUBMANDIBULAR**
- **POSTAURICULAR**
- **RETROMANDIBULAR**
- **BICORONAL**

IDEAL APPROACH

- Based on sound anatomical principles
- Clear anatomical landmarks
- Protection to both facial, auriculotemporal nerve & external auditory canal
- Provide bloodless field
- Maximum exposure
- rapidly and confidently executed
- good cosmetic result
- Readily teachable

PREAURICULAR APPROACH

ALKAYAT –BRAMLEY INCISION


POST BRANCH
SUPERFICIAL TEMPORAL A
2.16
SKIN INCISION
TRAGUS
LOWER LIMIT OF
SKIN INCISION
BRANCHES OF FACIAL N

Temporal scalp shaved upto 6cm above &forward the helix.

↓

Starts about a pinna's length

↓

Temporal incision curved backward & downward upto the uppermost attachment of pinna

↓

Following this anteriorly to the tragus and then moving endaurally and finally out again to the skin crease in front of the lobe of the ear and no further


SB 3 2004

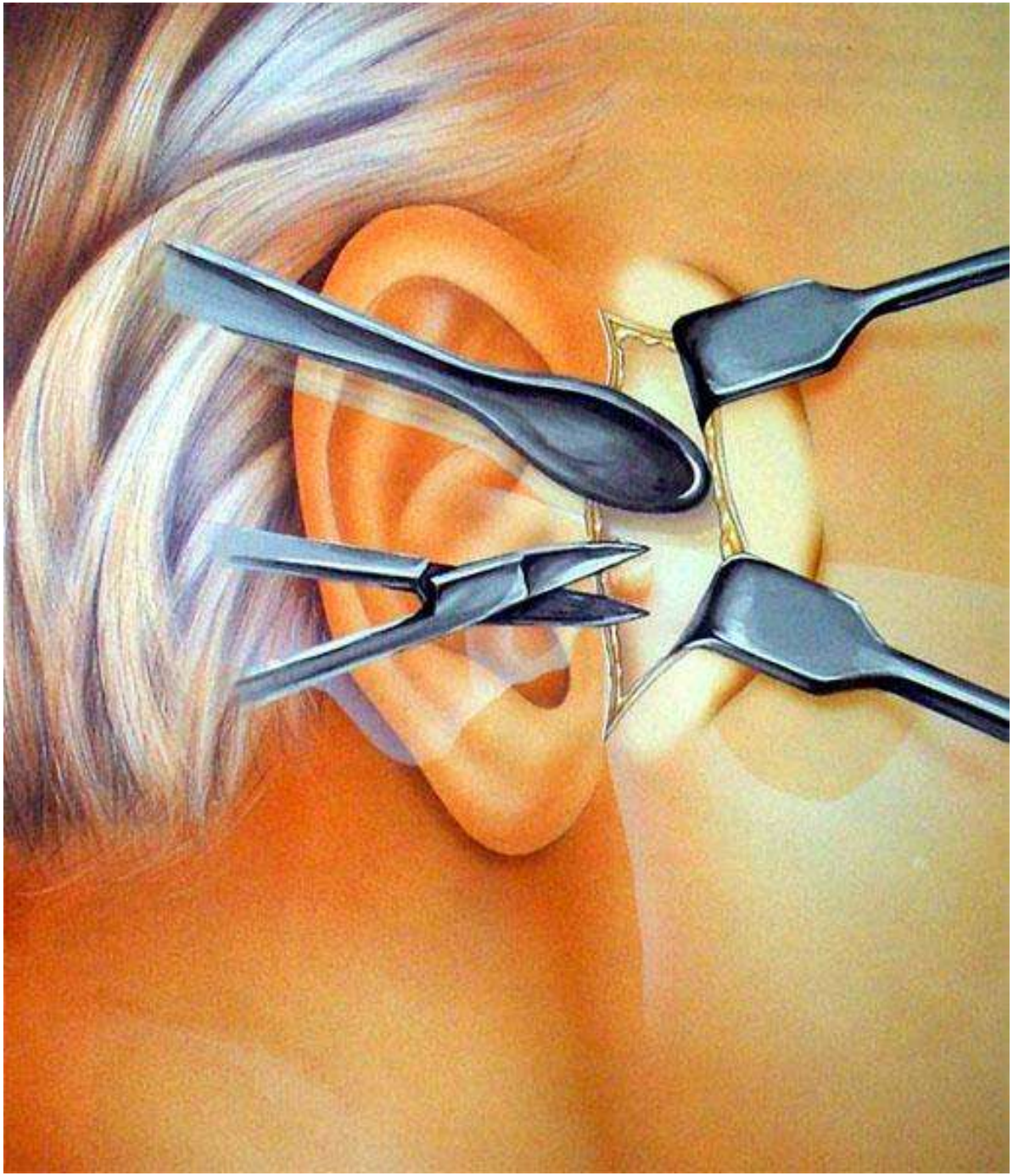
Incision is taken down to temporal fascia and is lifted as a part of skin flap.

↓

At 2cm above the malar arch(stop incision)

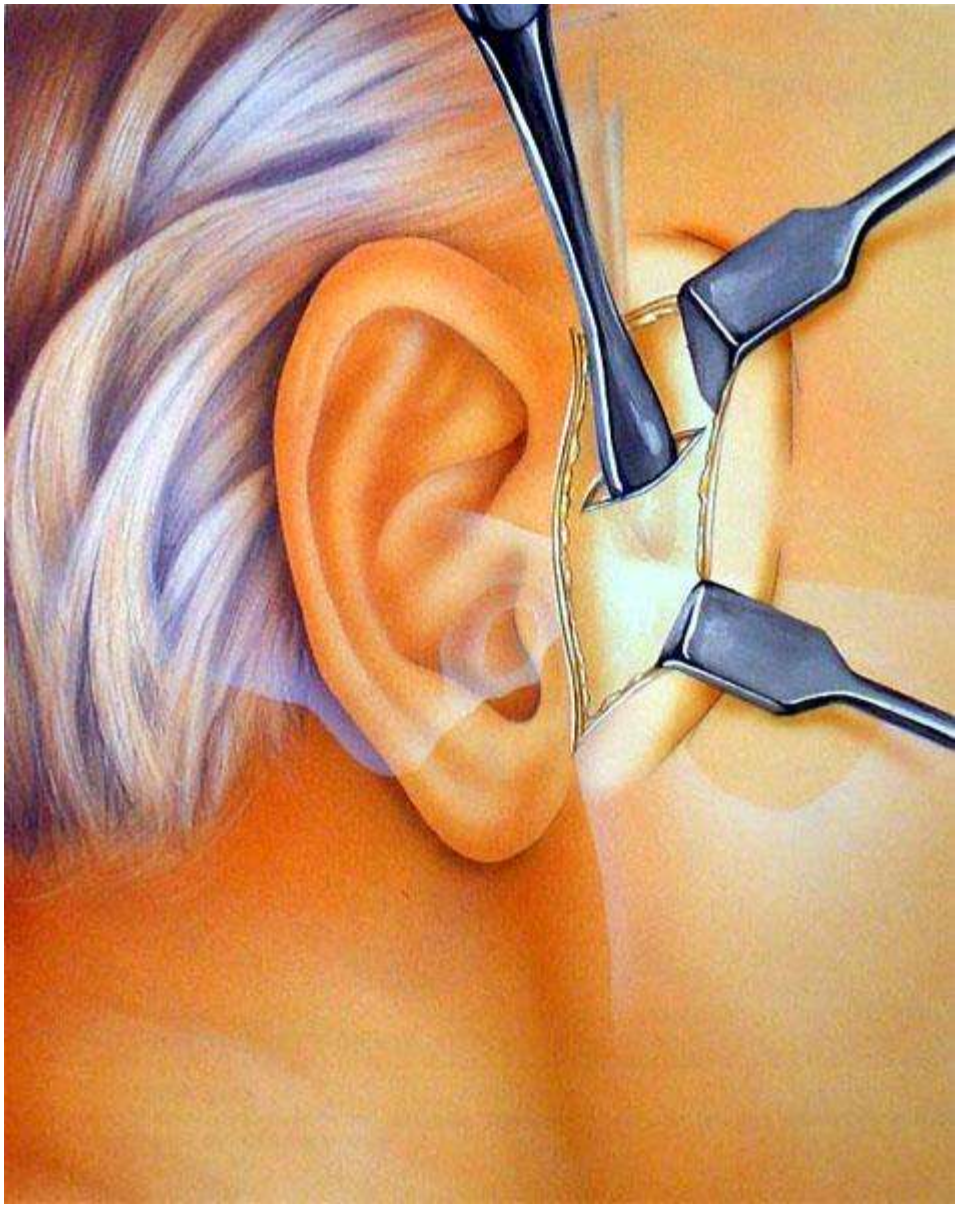
↓

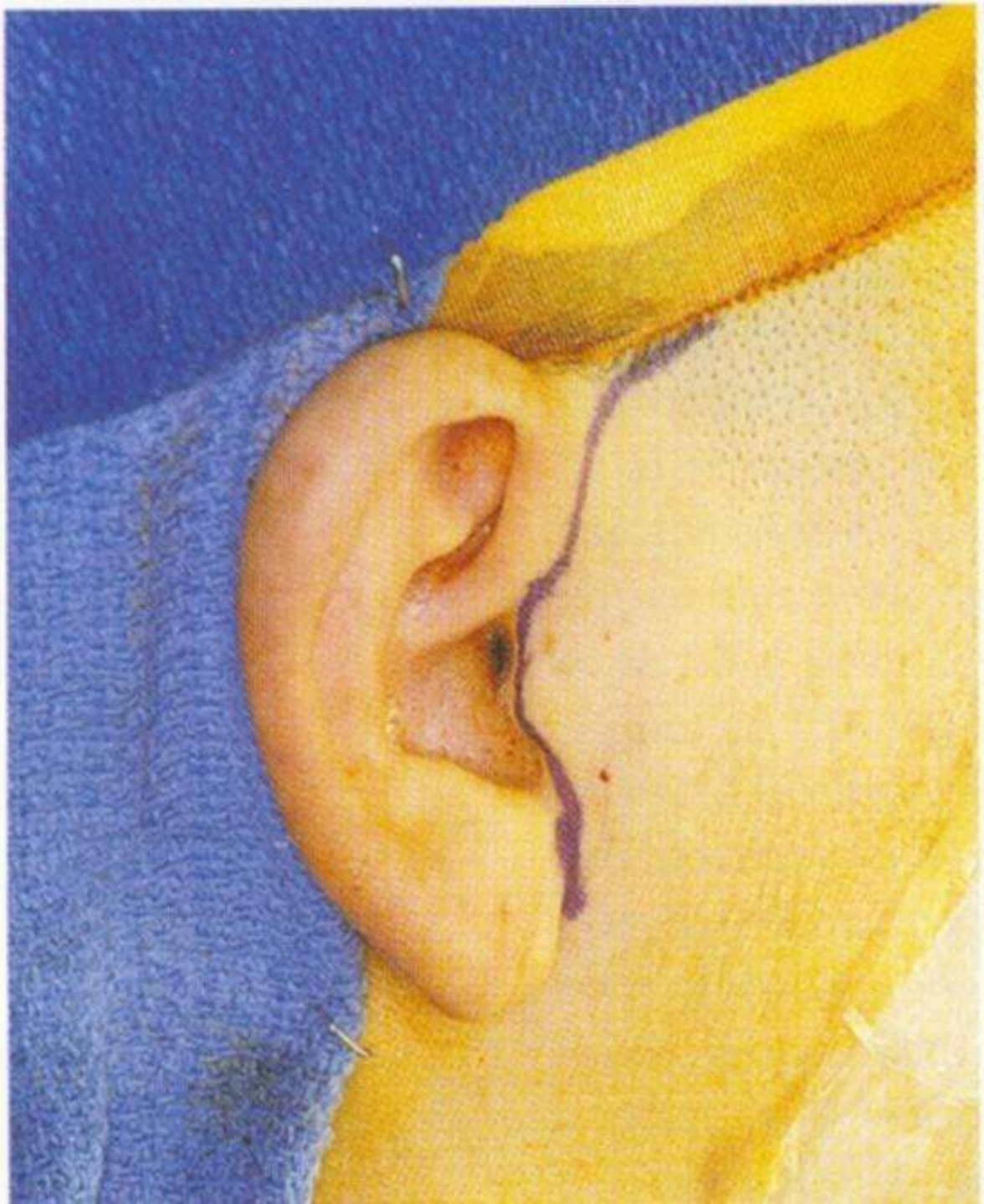
Avascular plane close to canal cartilage is identified and skin is dissected off the cartilage dissection defines an avascular plane between canal and parotid lobe dissection directly leads to the post glenoid tubercle

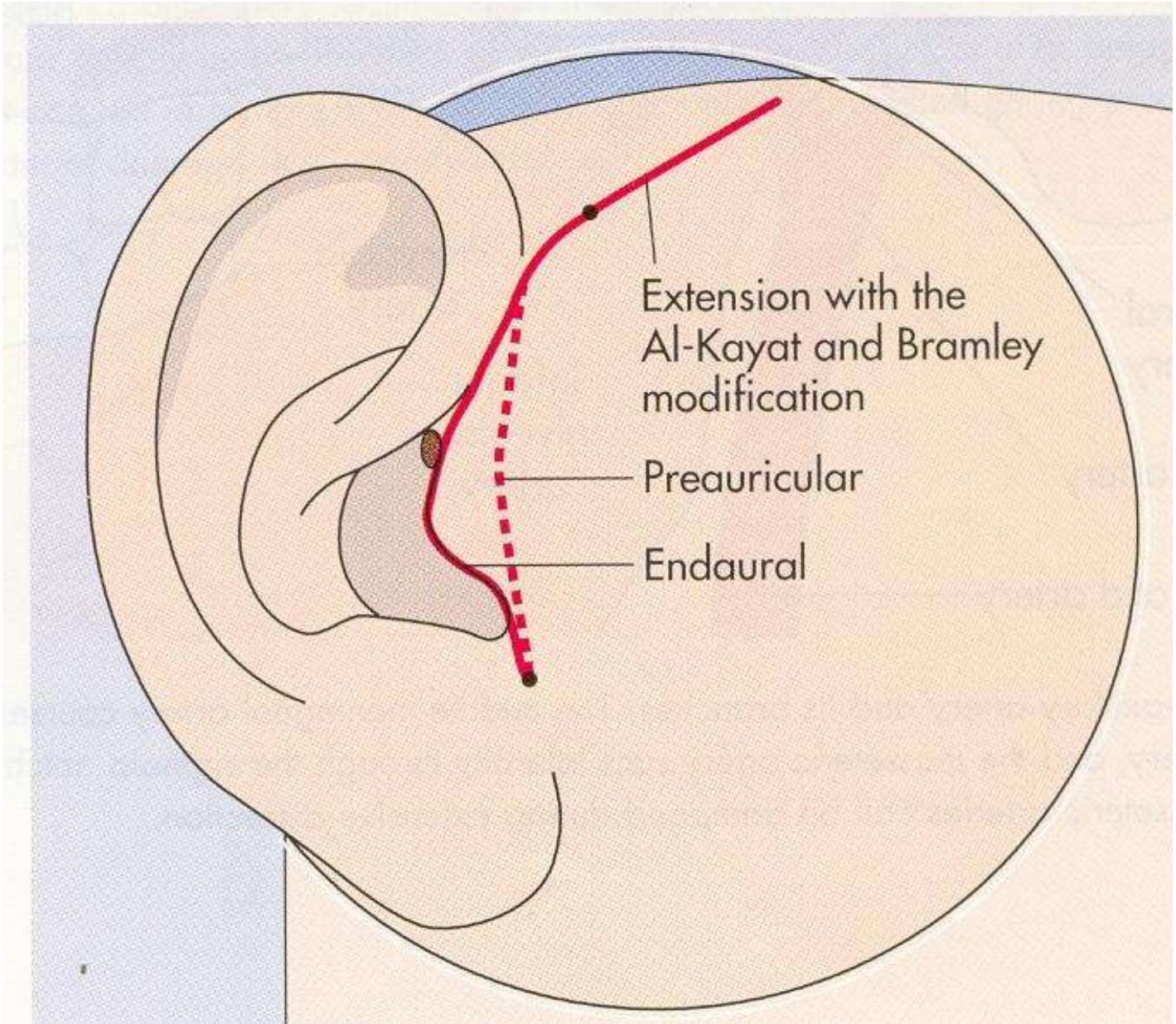


Pocket between the lateral and medial layers of the temporalis fascia is identified and an incision running at 45 degree upward &forward from malar base is made through the sf layer of temp f.

Once inside the pocket the periostium of the malar arch on its deeper surface is safely incised &raised as one flap with the outer layer of temp f &sf fascia containing the nerves.



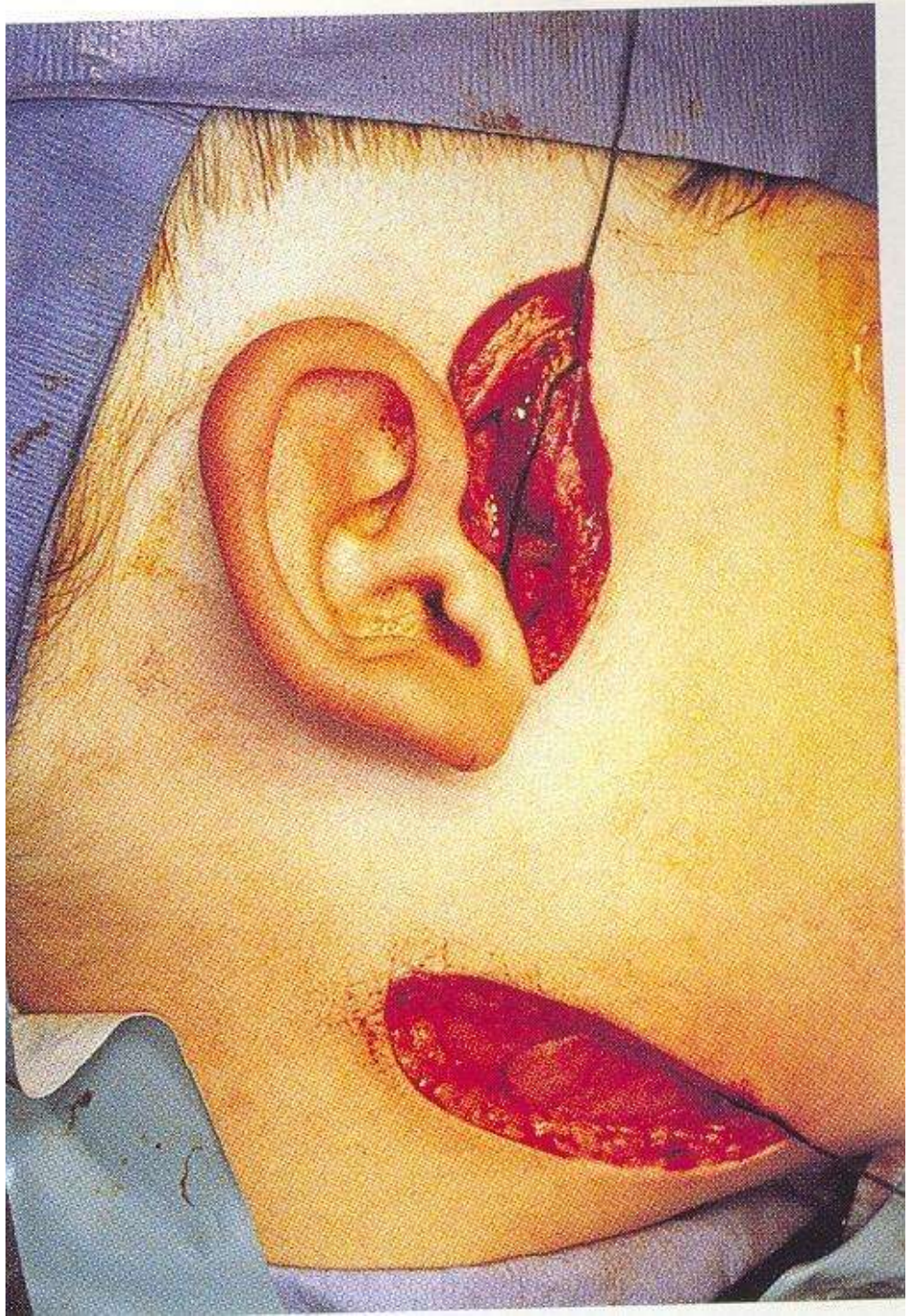


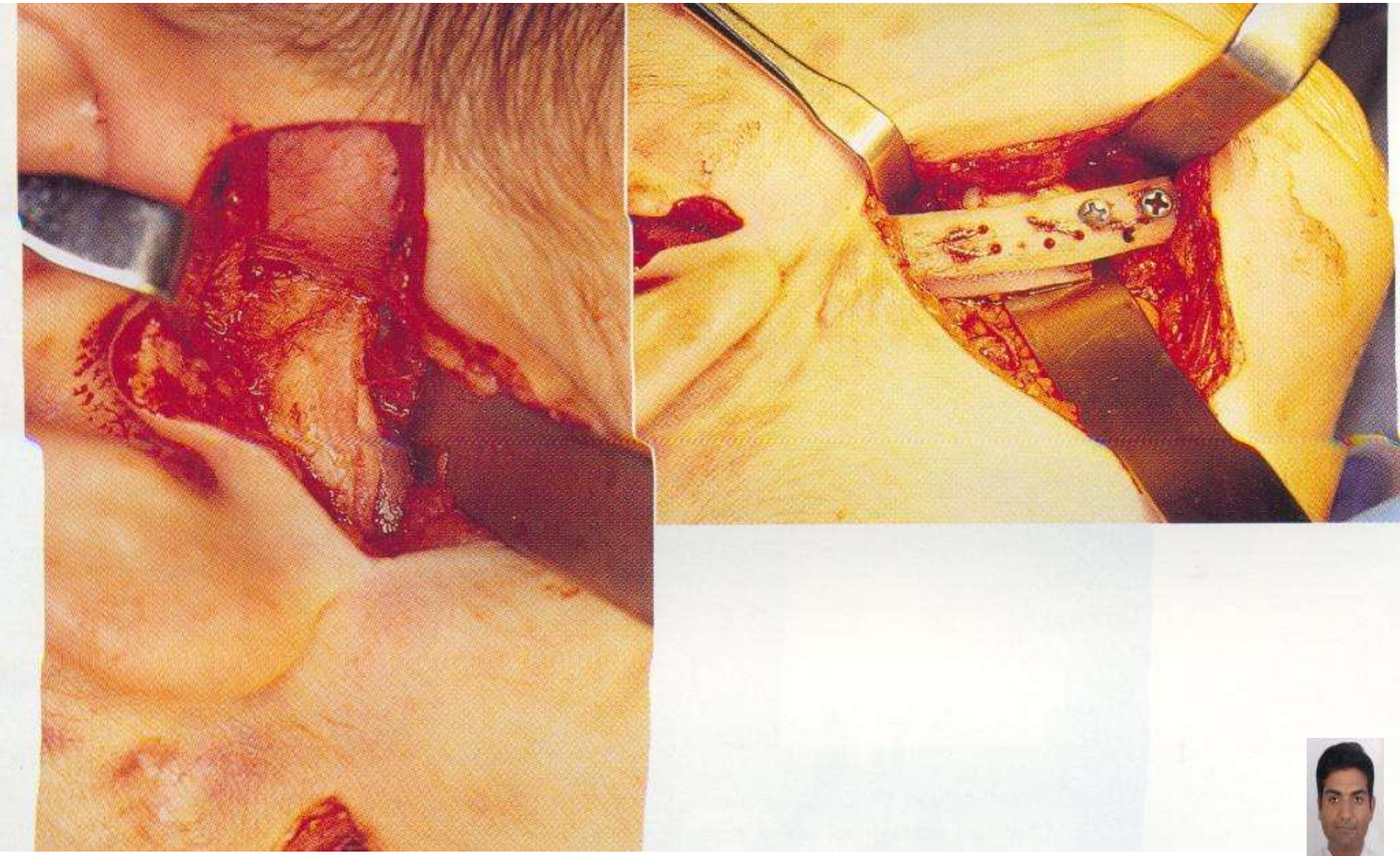

Extension with the
Al-Kayat and Bramley
modification
Preauricular
Endaural

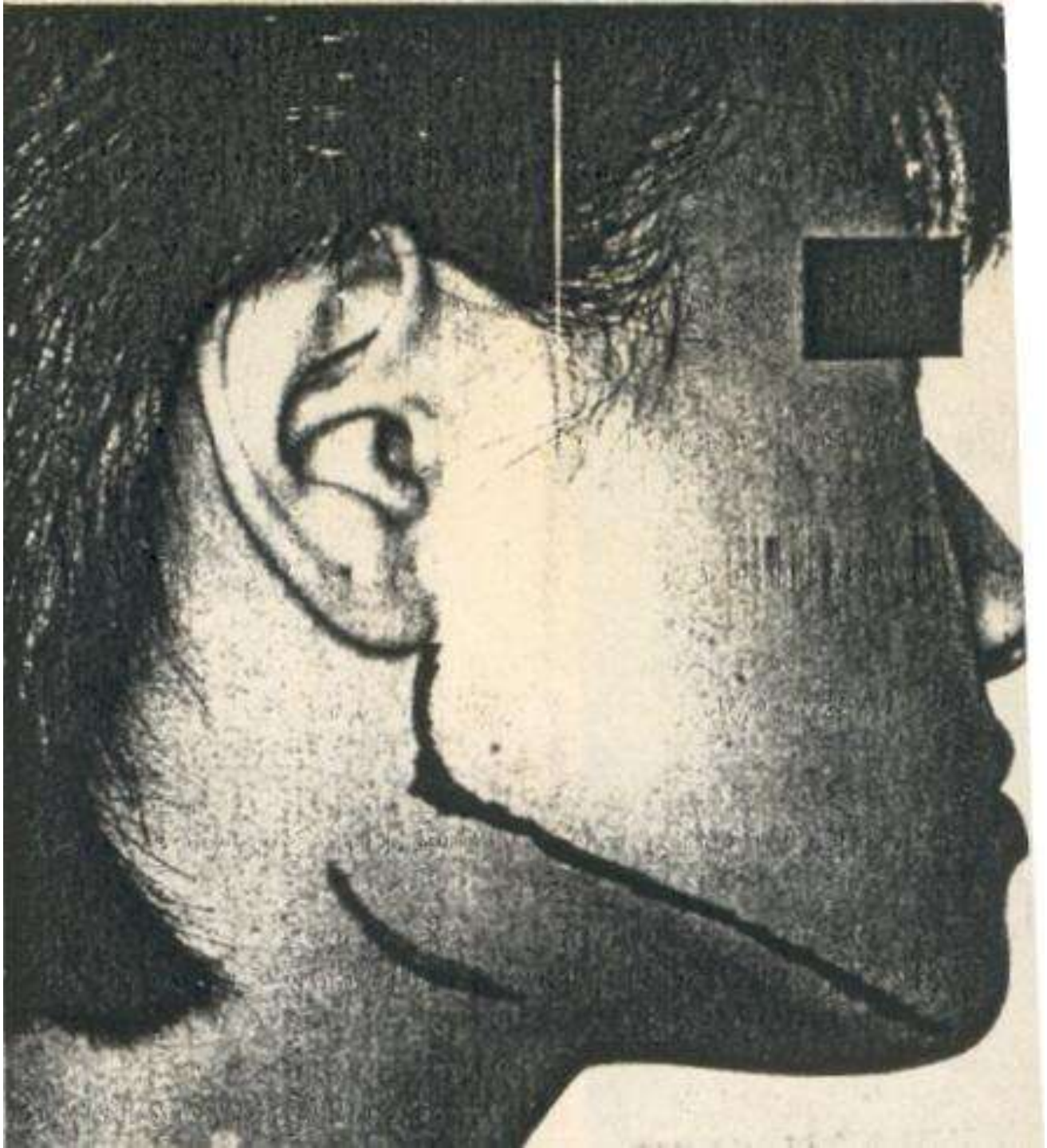
The Extended Preauricular Incision (The Hockey stick Incision) (Thoma, 1958)

SUBMANDIBULAR

APPROACH







The Retromandibular Approach


16


2005 11 16

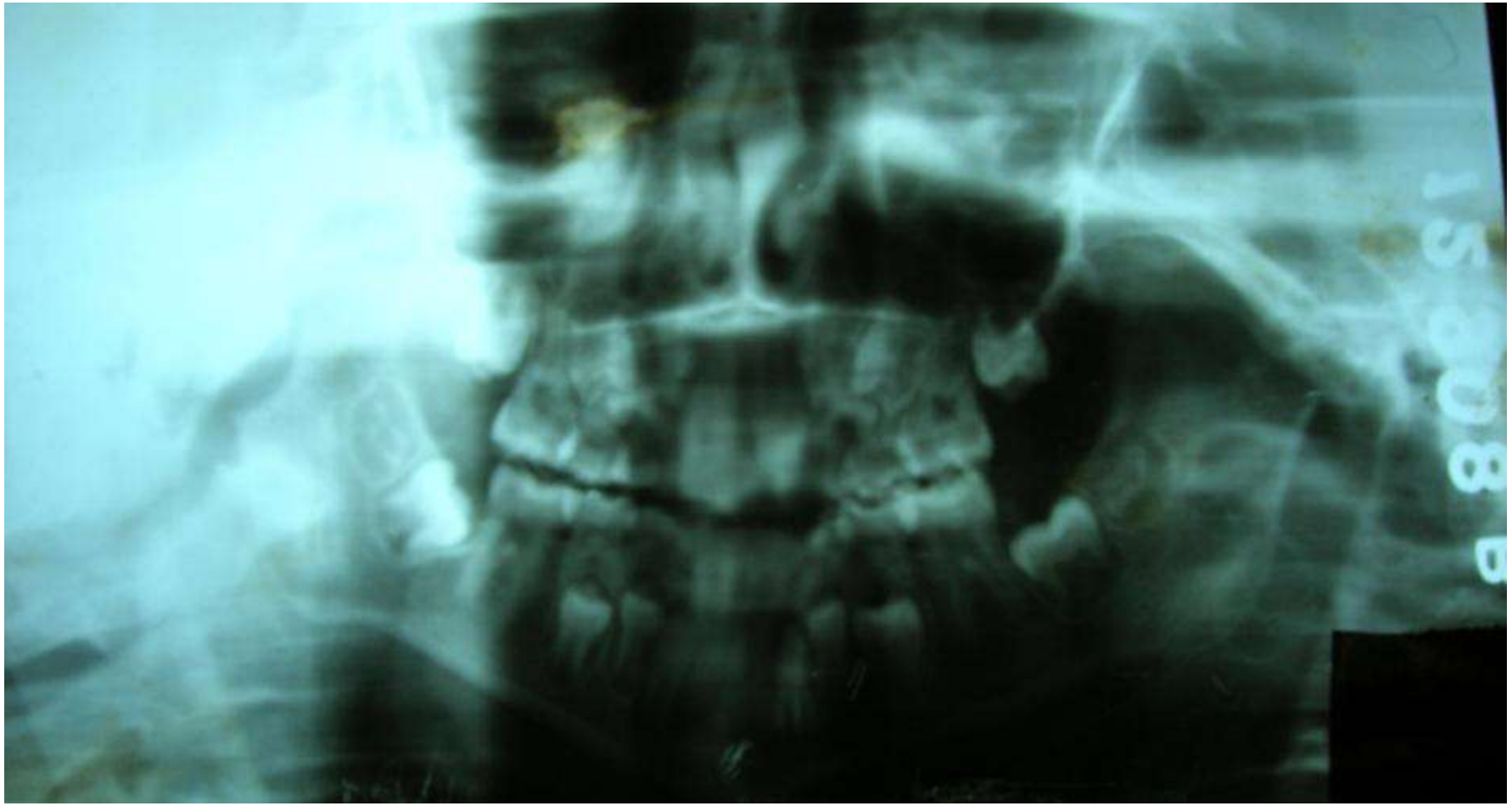
The Postauricular (Retroauricular) Approach

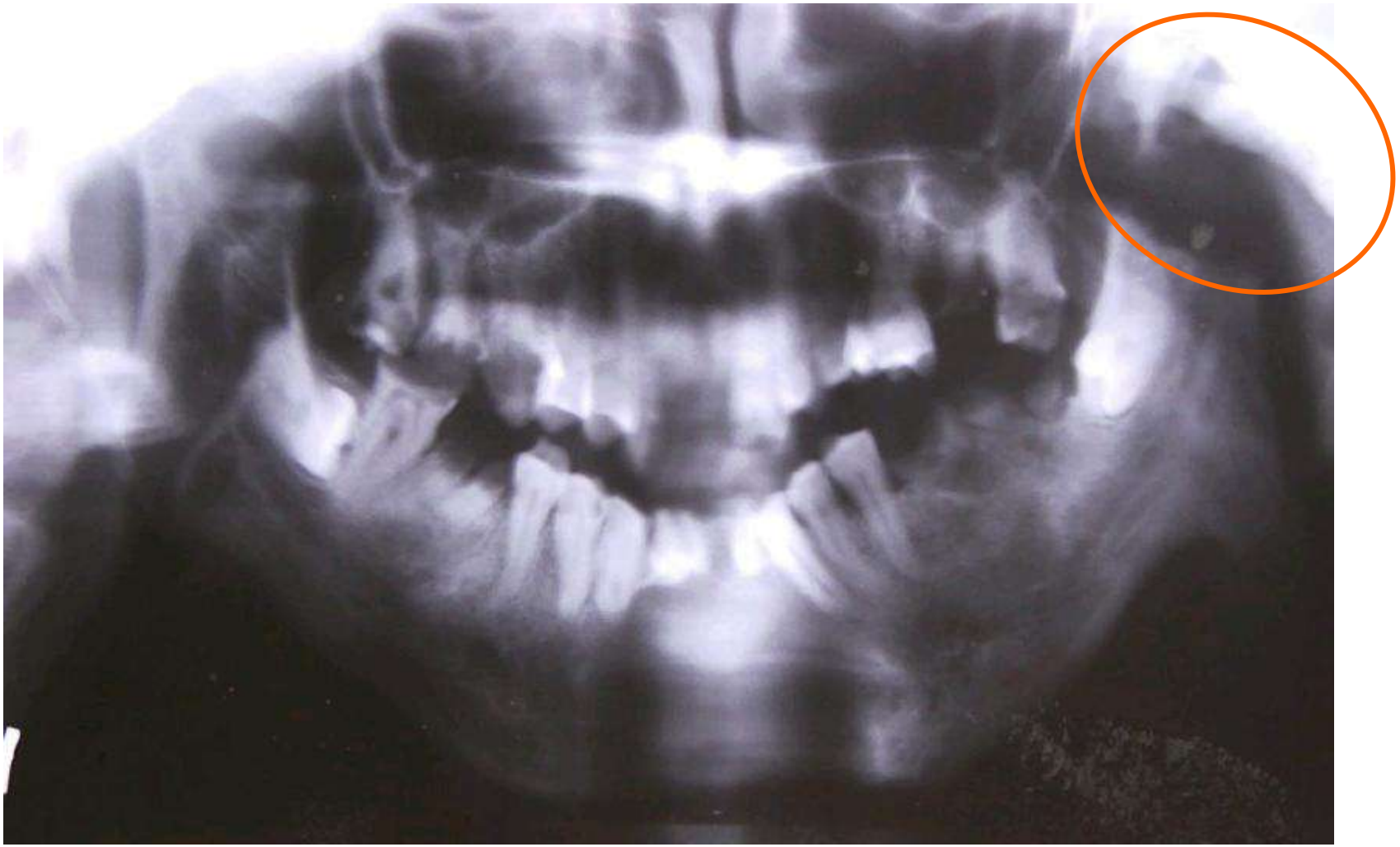
Dissection through the Cartilaginous external auditory canal

Gap Arthroplasty

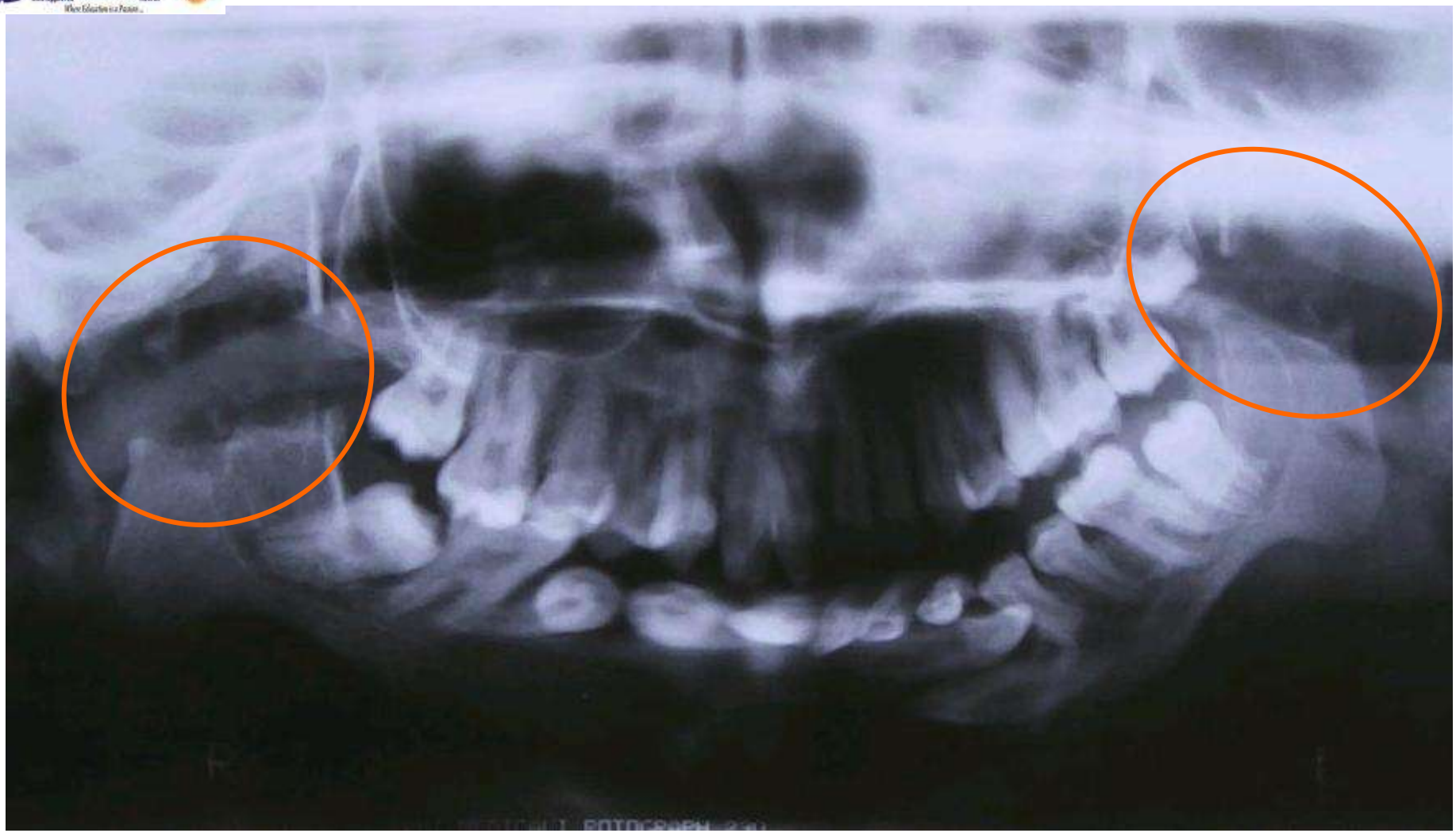
- Simple gap arthroplasty
- At least 1.5cm gap between the ramus and glenoid fossa
- Ipsilateral coronoidectomy, when required
- Contralateral coronoidectomy, as necessary

Bilateral ankylosis – gap arthroplasty





Unilateral Gap Arthroplasty



Bilateral Gap arthroplasty

Advantage & disadvantages of gap arthroplasty

- Advantages:
  - simplicity & short operating time
- Disadvantages
  - development of pseudo-articulation & short ramus
  - sometimes failure to remove bony pathology
  - increased risk of re ankylosis
  - anterior open bite in bilateral gap arthroplasty
  - premature occlusion on affected side & open bite on contralateral side in unilateral gap arthroplasty
  - suboptimal range of post-op range of motion

Interpositional Arthroplasty

AUTOGENOUS

Temporalis Fascia

Temporalis muscle

Native Meniscus

Native Condyle

Costochondral Graft

Postauricular cartilage

Illiac crest

Strernoclavicular

Alloplastic Total TMJ Prosthesis

Metallic prosthesis

Acrylic condyle

Silicon prosthesis

Joint Prosthesis

Head is of cobalt-chromium-molybdenum alloy

Glenoid fossa is of ultra-high-molecular weight polyethylene

WHAT PREVENTS REANKYLOSIS ?

1.GAP OF SUFFICIENT WIDTH

2.CAREFUL INTERPOSITION

3.JAW EXERCISES PRORER AND

FOR A LONGER PERIOD

Reconstruction of Mandible

- Osteotomies
- Joint Prosthesis
- Distraction Osteogenesis
- Orthodontics

- COMPLICATIONS

1. INTUBATION
2. NERVE INJURIES
(N…FACIAL,Auriculotemporal nerve)

3. BLEEDING (superficial temporal artery, internal maxillary artery)
4. INJURY TO EAR & ITS CANAL
5. Frey's syndrome
6. RECURRENCE

TMJ ARTHRALGIA

ETIOLOGY

- OCCLUSAL DISHARMONY
- PSYCHOGENIC FACTORS – BRUXISM,MUSCLE SPASM
- TRAUMA
- ACUTE SYNOVITIS
- INTERNAL DERANGEMENT
- RA/OA

SYMPTOMS

- PAIN ANTERIOR TO EAR SNAPPING,CRACKING,GRATING SENSATION IN THE JOINT DURING MASTICATION
- INABILTY TO OPEN MOUTH NORMALLY WITHOUT PAIN
- INABILITY TO OCCLUDE THE POSTERIOR TEETH COMPLETELY IN THE EFFECTED SIDE

CLINICAL FEATURES

- TENDERNESS AT THE EFFECTED JOINT DURING NORMAL OPENING /CLOSING MOTION
- JAW DEVIATES TO THE EFFECTED SIDE
- CREPITATION
- DISCREPANCY IN OCCLUSION
- NERVOUS TENSION

RADIOGRAPHIC FINDINGS

- Hazziness in joint
- Restricted motion of the condyle – beginning of ankylosis/spasm
- Posteriosuperior displacement of the condyle – decreased vertical height
- Erosion/demineralization of the condyle head – metabolic, tumor
- Proliferative changes – diffused enlargement of condyle head.
- Subluxation/luxation – relaxation of support ligament

Osteoarthritis (degenerative joint diseases)

- Etiology – unknown
- It is a disease of aging process and associated with articular cartilage.
- Symptoms:
  - pain on movement of the jaw as the day progresses
  - limitation of movements
  - joint noise, grating, grinding or crunching

Signs:

- tenderness over the joint, particularly with the jaw opening
- decreased mouth opening & lateral movements
- crepitus on auscultation

Treatment:

- Patient < 35 years refractory to conservative treatment and require surgery
- In old age it burns out in 1 – 3 years.

Conservative treatment

- Establishment of functional occlusion
- Use of TMJ diathermy
- Relief of associated myospasm
- Supplement analgesics
- Intra-articular steroids

Surgical treatment

- High condylectomy
- If meniscus perforated – dermal graft or silicon blocks – glenoid fossa

Rheumatoid arthritis

- unknown etiology but may be due to hypersensitivity reaction to bacterial toxin specially Streptococci
- 2 phase process
  - phase 1 systemic infection – inflammatory response within joint
  - phase 2 autoimmune reaction

Sign and symptoms

- affects multiple joints
- pain & crepitus of TMJ
- limitation of movements
- deformity
- subcutaneous nodules over pressure points & sites of friction
- diagnostic rheumatoid factor positive

Treatment

- conservative
  - anti-rheumatoid therapy
  - rest
  - heat
  - analgesics
  - anti-inflammatory
  - steroids

Surgical

- excision of the pathologically involved portion of the

Condylar head & interposing a carved silicon block

- total joint replacement

- Internal derangement
- osteoarthritis
- pathological
  - benign
  - malignant

Benign tumors and lesions

- osteoma
- osteochondroma
- giant cell granuloma
- giant cell tumor
- hemangioma
- synovial chondromatosis
- arteriovenous malformation
- neurofibroma
- ganglion cyst

Malignant tumors

- osteogenic sarcoma
- chondrosarcoma
- synovial cell sarcoma
- synovial fibro sarcoma
- multiple myeloma
- lymphoma
- aggressive fibromatosis

Arthrocentesis or joint lavage

HYPERMOBILITY

-Physiological

-PATHOLOGICAL

A)SUBLUXATION

B)DISLOCATION
ACUTE &CHRONIC
PERSISTANT /RECURRENT

- Acute
- Chronic/reccurent/habitual
- Long standing

- Uni/bilateral
- In unilateral chin deviates to the contralateral side

- ETIOLOGY
- PROLONGED OR SUDDEN WIDE OPENING .
- PRERDESPOSING FACTORS
- -HYPERMOBILITY
- -CAPSULAR LAXITY
- -BONY CHANGES
- -MUSCULAR CONSIERATIONS

- PATHOGENESIS
- -LOCKING
- -MUSCLE SPASM

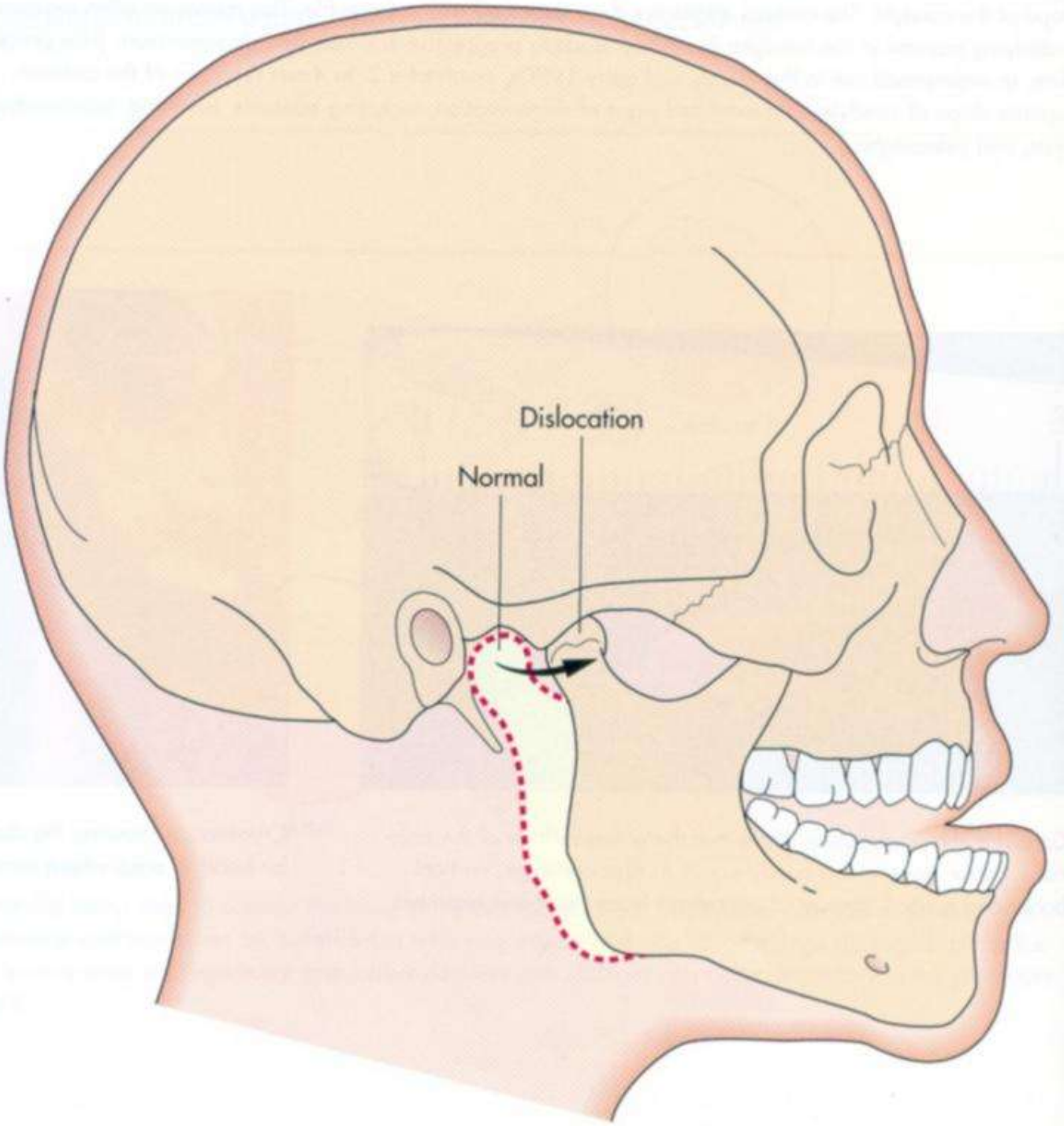
- Tt (ACUTE CASES)
- -without anaesthesia
- -with L.A
- -WITH I.V MUSCLE RELAXANT
- -UNDER G.A

- Tt (PERSISTANT CASES)
- -manual reduction
- -indirect reduction …bone hooks
- -open/direct reduction
- -condylotomy/lectomy
- Inverted reverse L osteotomy
- Plate at anterior tubercle

MANUAL REDUCTION

- DOWNWARD PRESSURE ON MANDIBULAR MOLARS AND UPWARD PRESSURE ON CHIN,ACCOMPANIED WITH POSTERIOR DISPLACEMENT OF THE ENTIRE MANDIBLE SIMULTANOUSLY

DISLOCATION


Dislocation
Normal

- 3% of joint dislocation
- Higher incidence in females
- Most common in anterior direction
- Can be superior, posterior and direct medial

• Subluxation: is substituted term from dislocation when incomplete dislocation occurs. Articular surfaces maintain partial contact and condyle is able to return to glenoid fossa voluntarily & aided by self manipulation.

• in dislocation there is complete separation of articular surfaces with fixation in abnormal position.

- Recurrent dislocation: dislocation which takes place repeatedly & which last for short or long intervals are referred as recurrent dislocation.

- Long standing dislocation: remains locked anteriorly for several days to years is an old or long standing dislocation.

CAUSES

A. Intrinsic: wide yawn (most common), vomiting, singing, laughing, wide biting, seizures. Drugs – Prochlorothizine cause – dyskinetic movements.

B. Extrinsic:

i. blow to the mandible, when in open position can result in dislocation rather a fracture can take place, whiplash like injury.

ii. manipulation of jaw during intubation

during general anesthesia.

iii. endoscopic procedures

iv. dental extraction

Predisposing factors:

- laxity of ligaments & capsule seen in cases of occlusal abnormalities & loss of vertical dimension.

- Articular eminence with short steep posterior slope or flat eminence & shallow fossa

CLINICAL EXAMINATION

Acute dislocation is not difficult to diagnose

1. Pain
2. Inability to close mouth
3. Tense masticatory muscles
4. Difficulty with speech
5. Excessive salivation
6. Protruding chin

6. Open bite

7. Hollowness in front of tragus

8. Lateral pole of condyle produces a characteristic protuberance anterior & below the articular eminence – which is usually seen & palpated.

9. Coronoid process may create a prominence below the zygoma.

In Unilateral dislocation: mandible swung away from side of dislocation. Deviation produces a lateral cross bite & open bite on contralateral side.

RADIOGRAPHIC EXAMINATION:

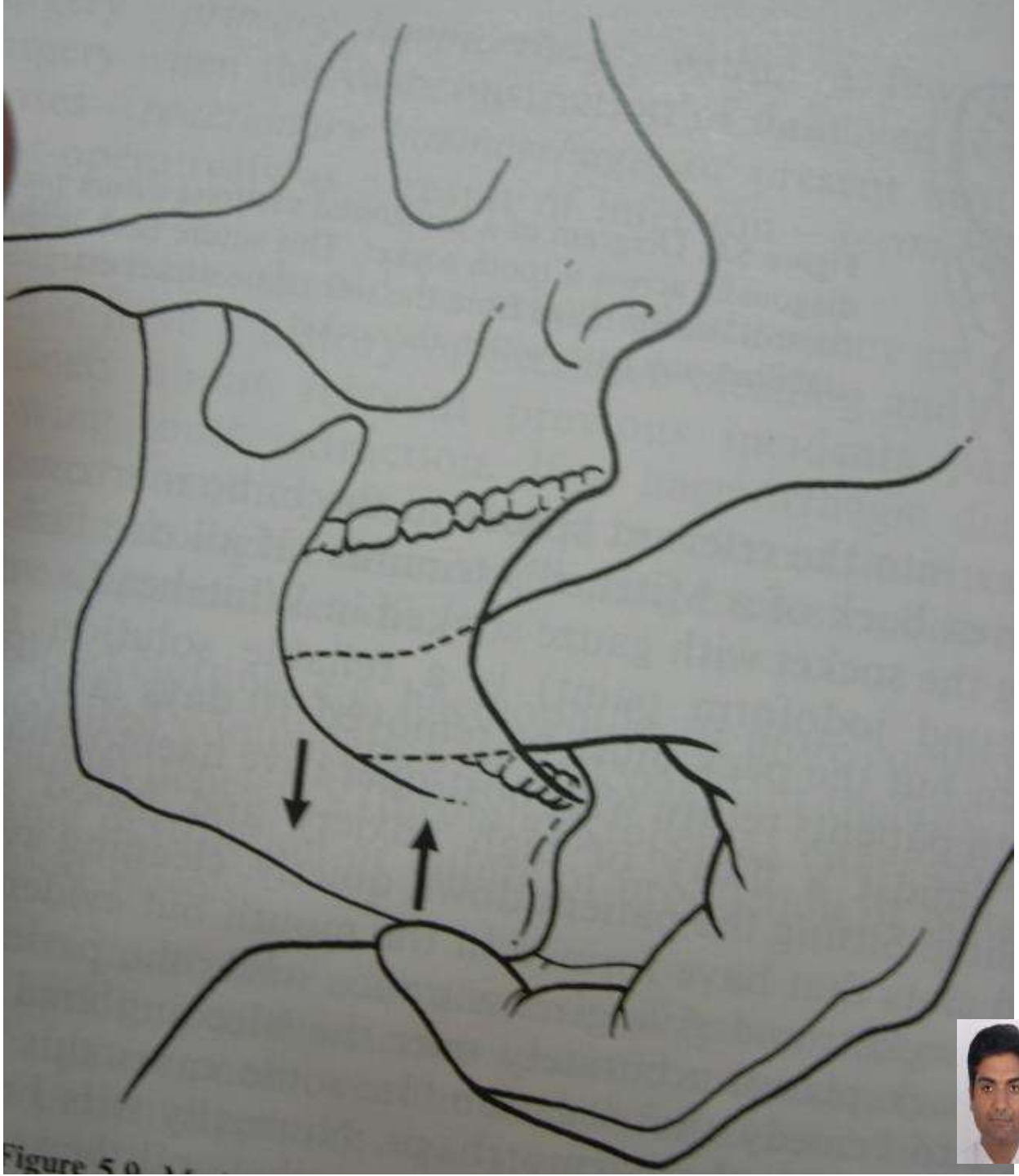
- Condyle is more superior and anterior in acute luxations.
- Steep articular eminence
- In long standing cases can be flattened.

MANAGEMENT

MANAGEMENT OF ACUTE DISLOCATION

Manual reduction

MANUAL REDUCTION

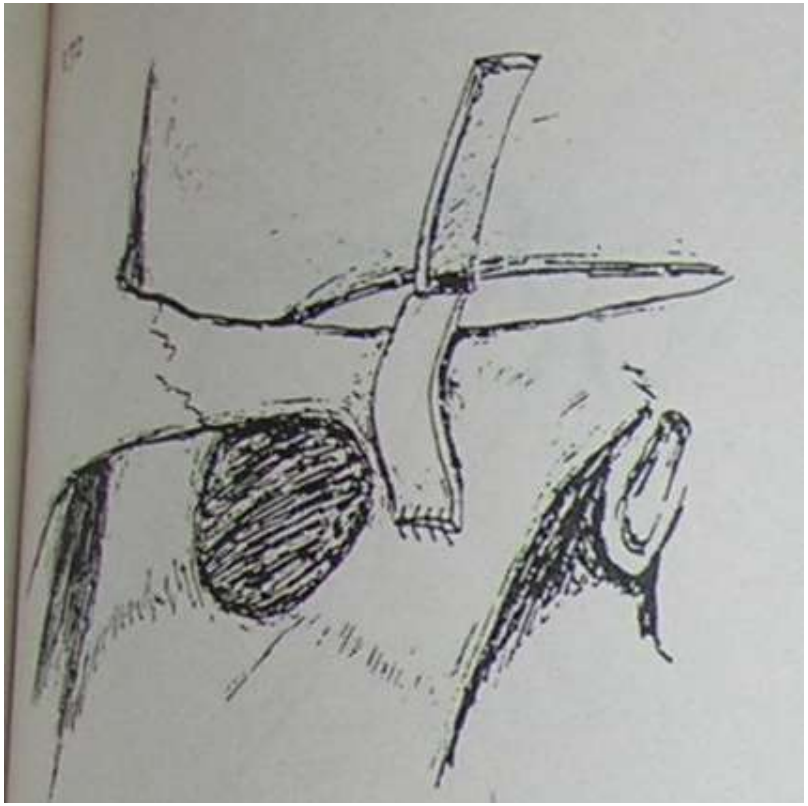


Non surgical management: intermaxillary fixation for 4 weeks allows damaged ligaments, capsule & disk to heal.

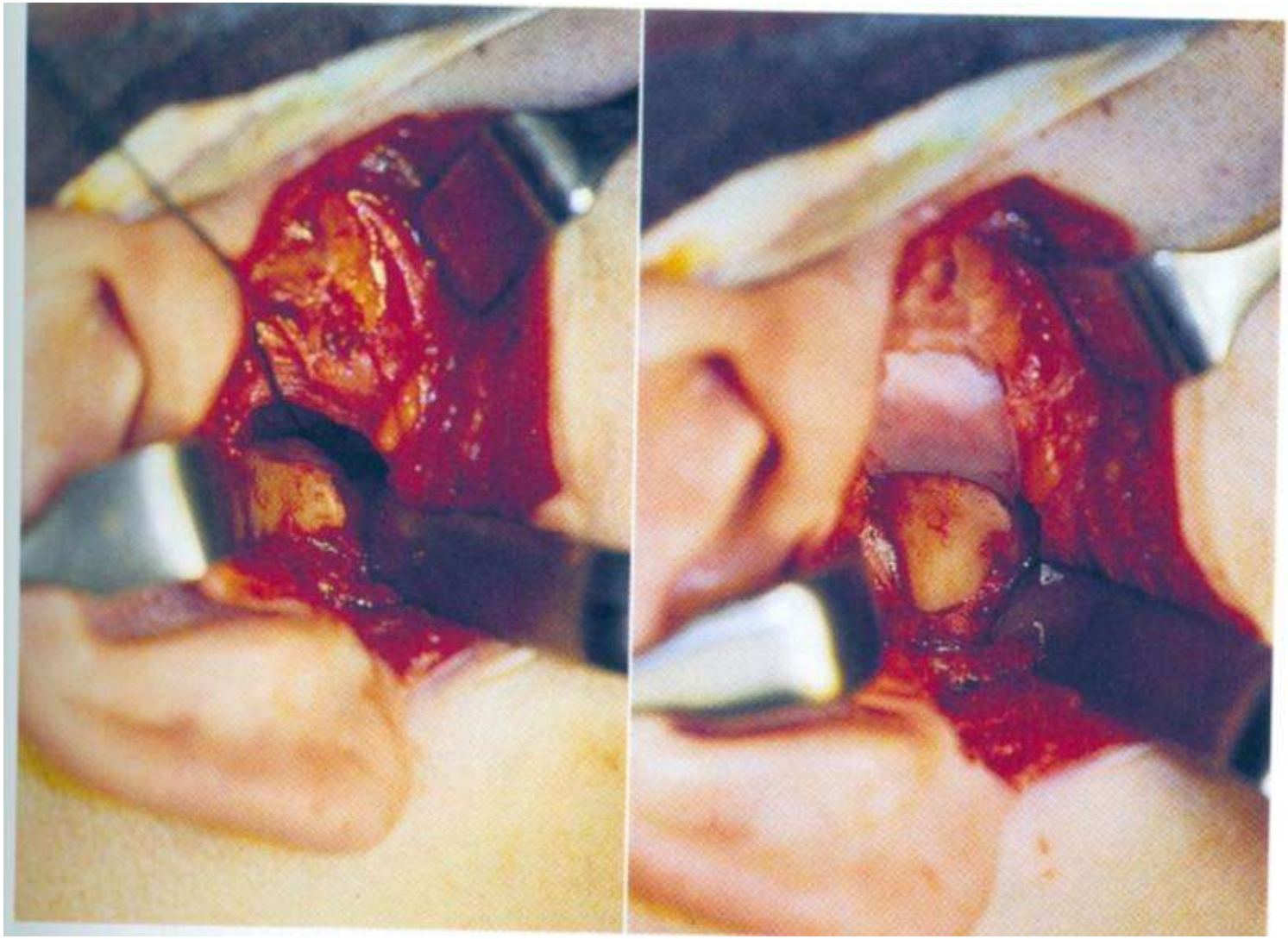
Surgical management:

1. Procedures limiting translation:

   a) anchoring procedures: capsuloraphy, capsule plication, ligamentopexy, flaps secured to capsule, autogenous & alloplastic sling between condyle & zygomatic process.



Temporal fascia flap



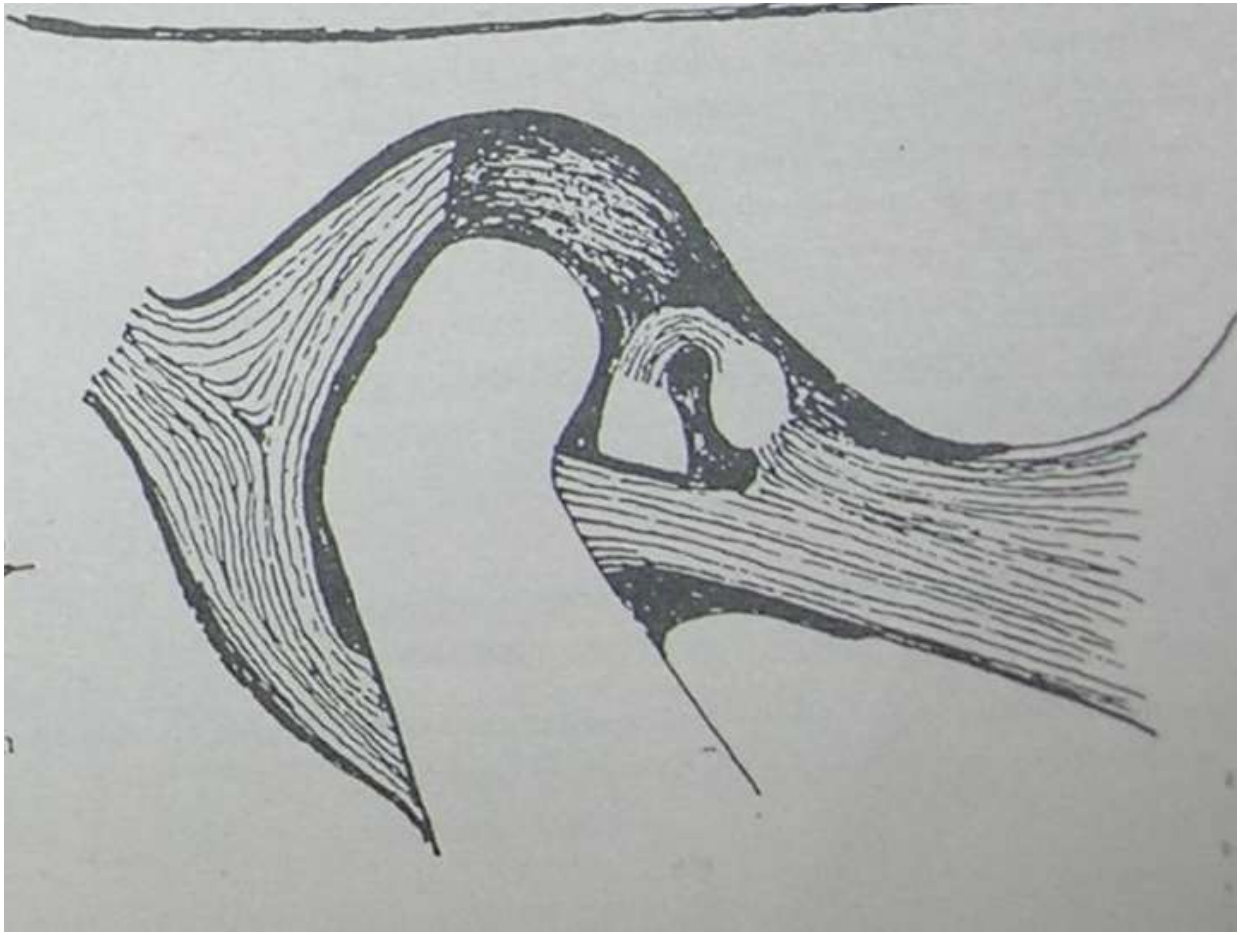
Menisectomy

b. <u>blocking:</u> effective in patient with systemic disease, elderly patients with degenerative changes.

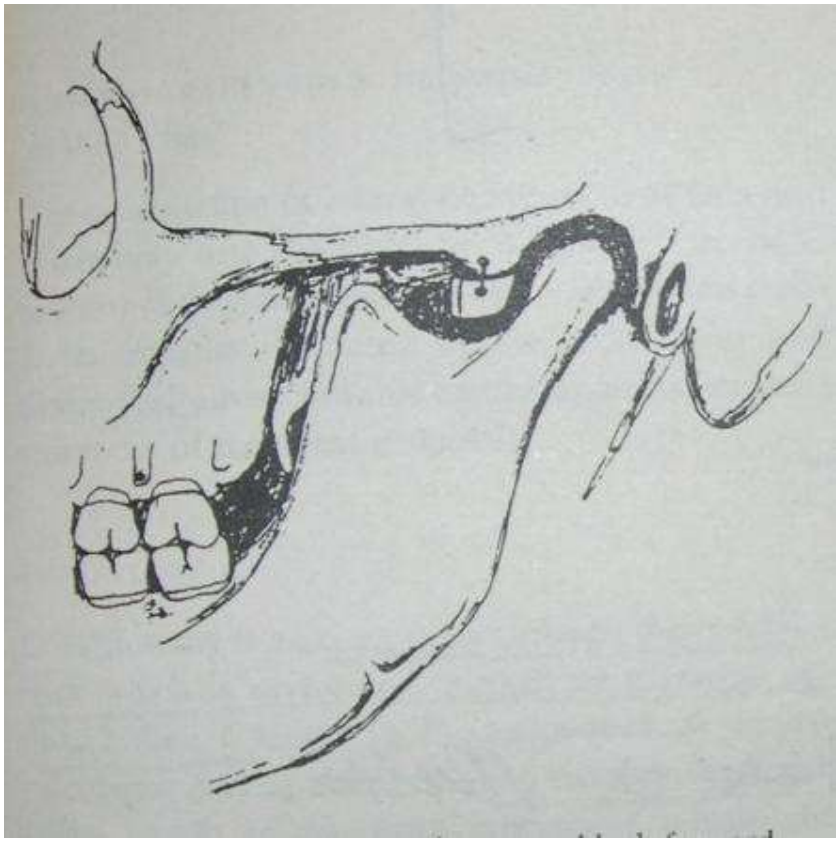
i. soft tissue: Konjetzny's procedure – disk is sutured anterior to condyle.

ii. bony:

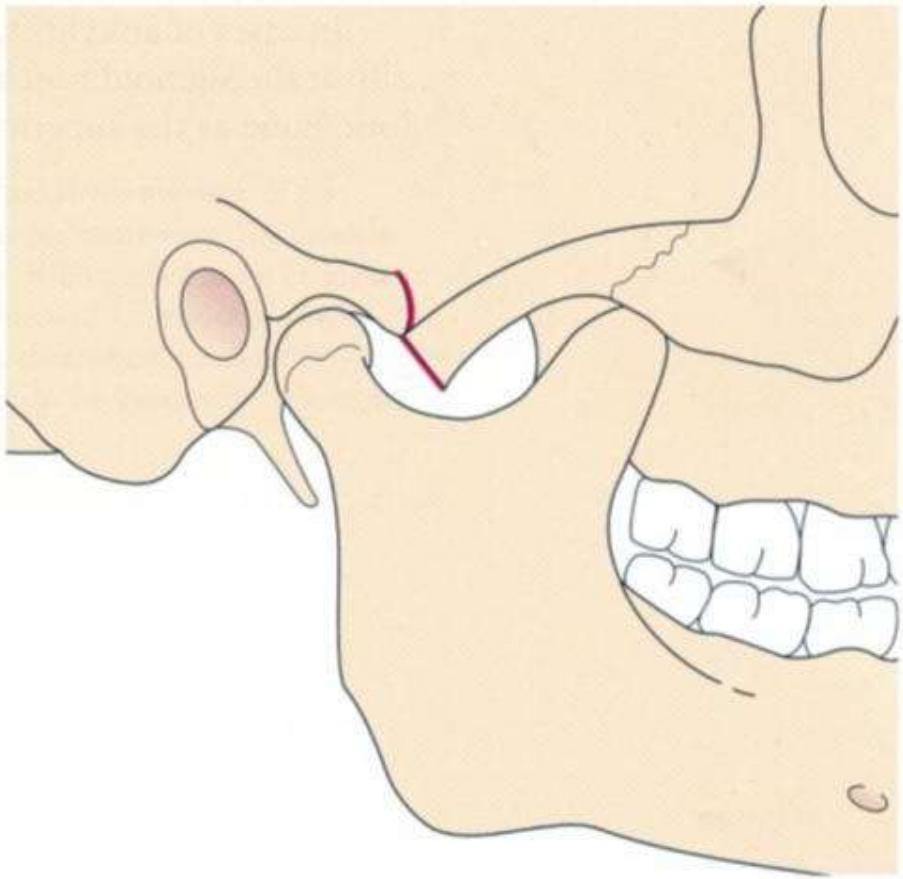
- Augmentation: bone graft over eminence
- Dautery or modified Dautery procedure
- Cr-Co prosthesis.



Konjetzny’s procedure



Bone graft



c. Lateral Pterygoid myotomy

2. Eliminating blocking factors in condyle path:

   a. Diskectomy

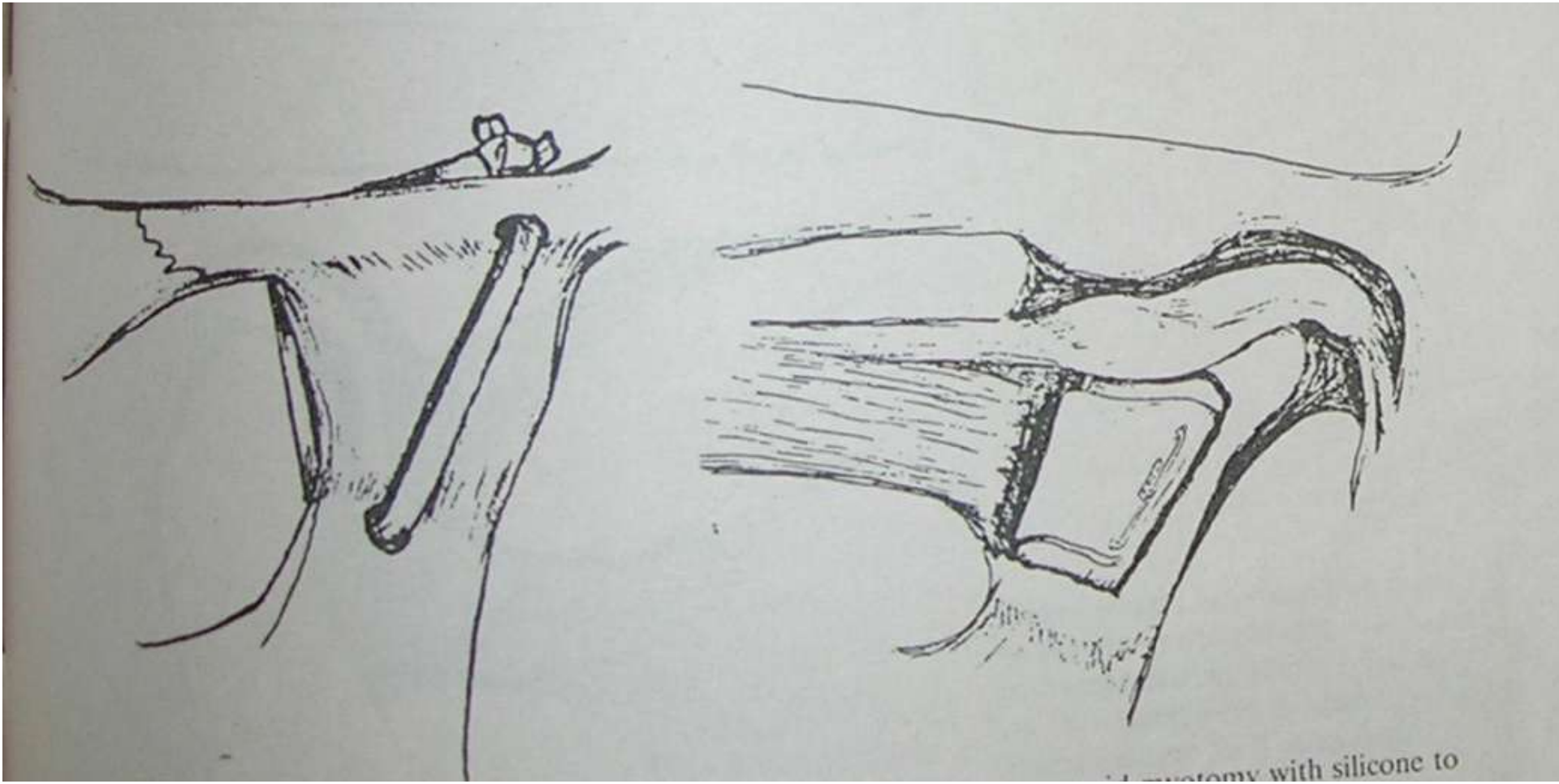
   b. Eminectomy

3. Combined procedures which eliminate blocking & limit translation:

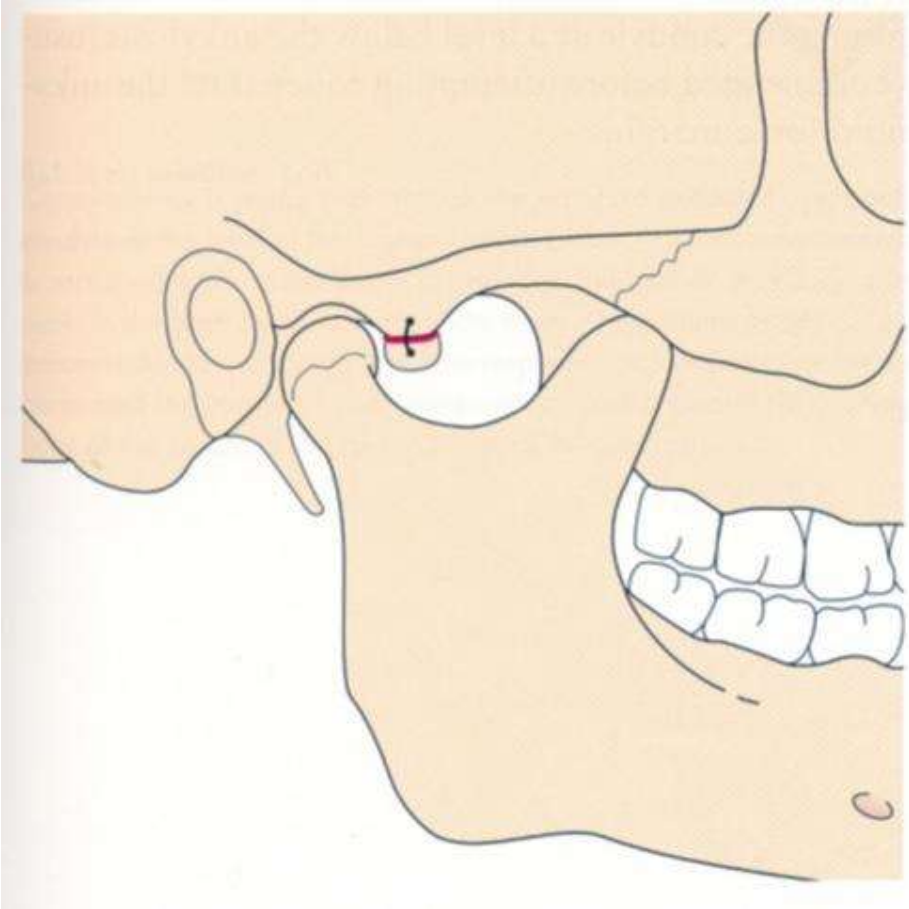
   a) Lateral pterygoid myotomy with diskectomy

   b) Condylotomy

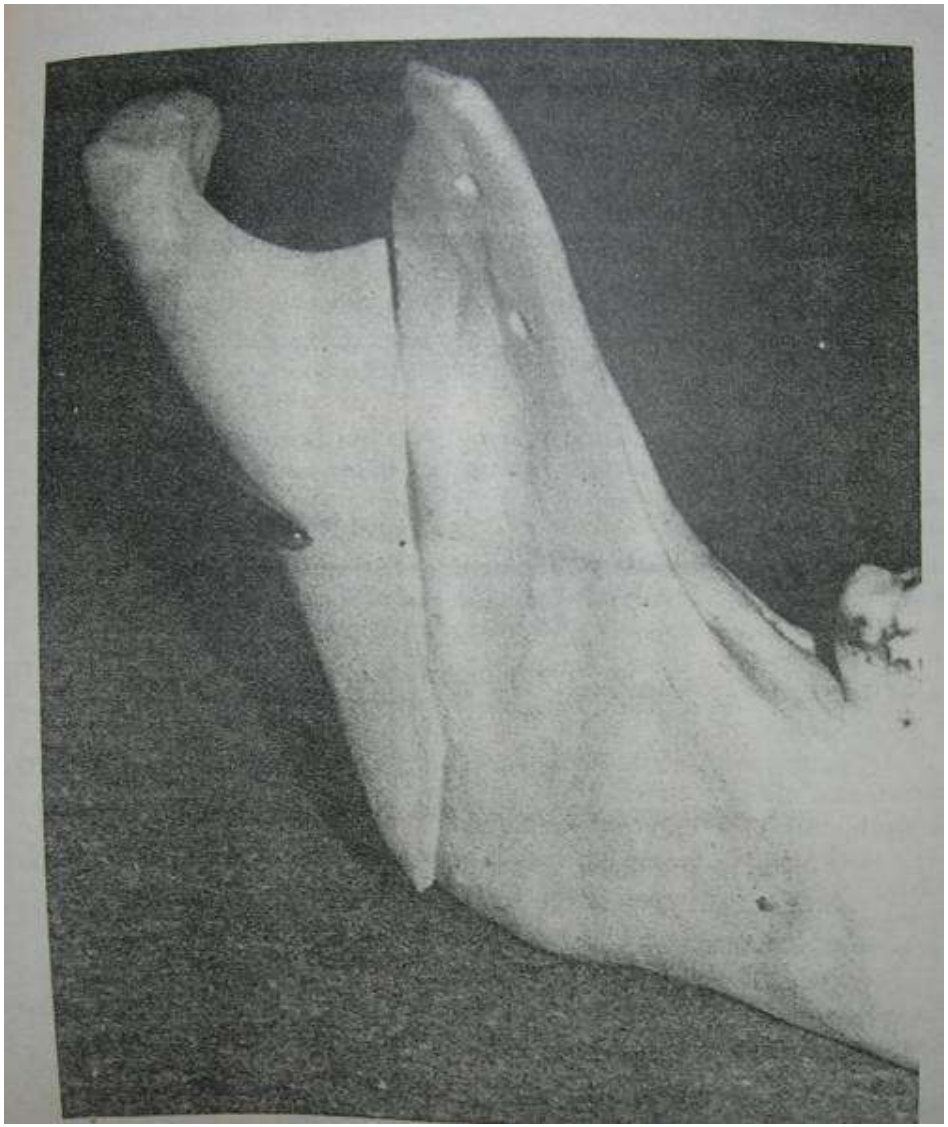
   c) Condylectomy



Anchoring sling and lateral pterygoid myotomy



A, View of a patient with chronic subluxation showing condyle-disk relationship at normal range of motion immediately before excessive motion, which results in anterior subluxation. **B,** Status postarticular eminectomy. Note the depth of surgical recontouring to eliminate condylar-eminence contact.



Condylotomy

4. Temporal myotomy

5. Sagital split osteotomy

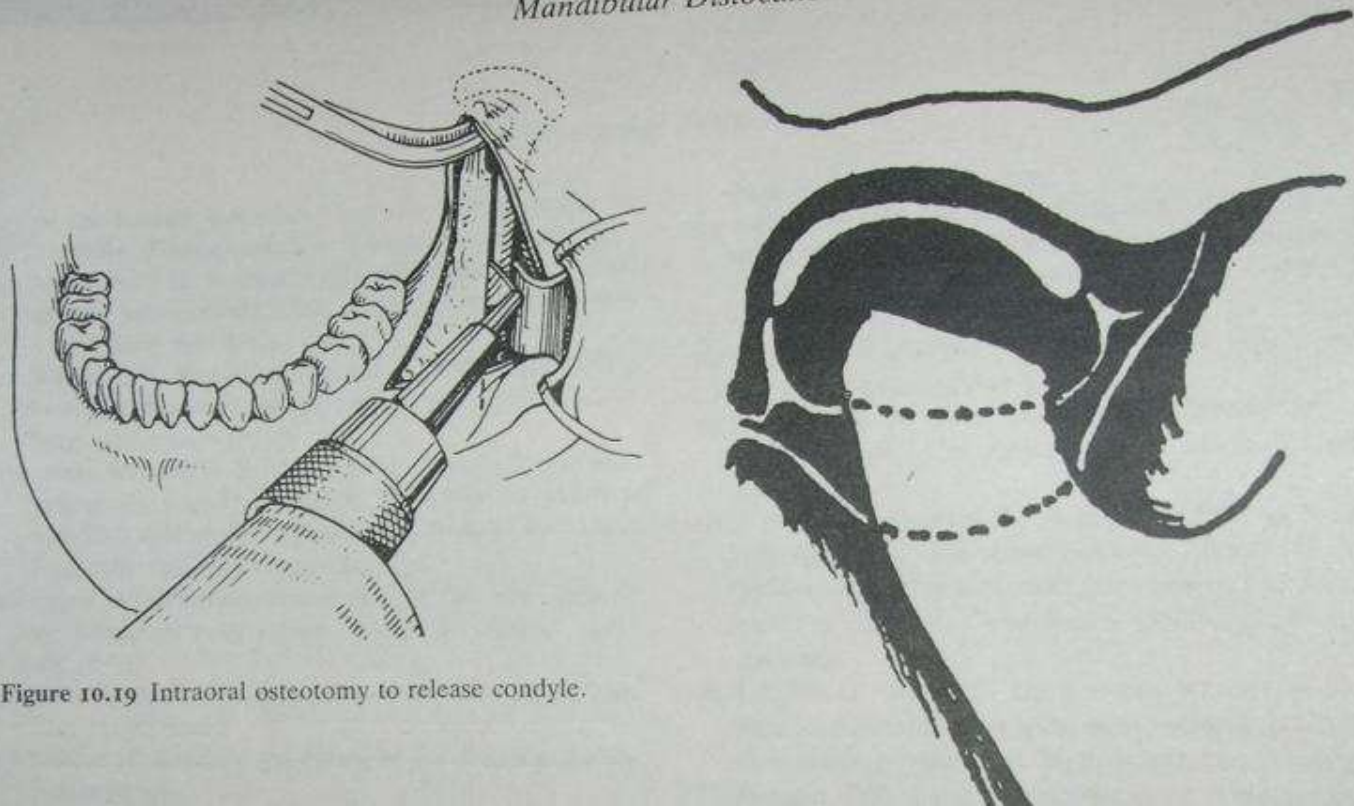


Figure 10.19 Intraoral osteotomy to release condyle.

Intraoral osteotomy

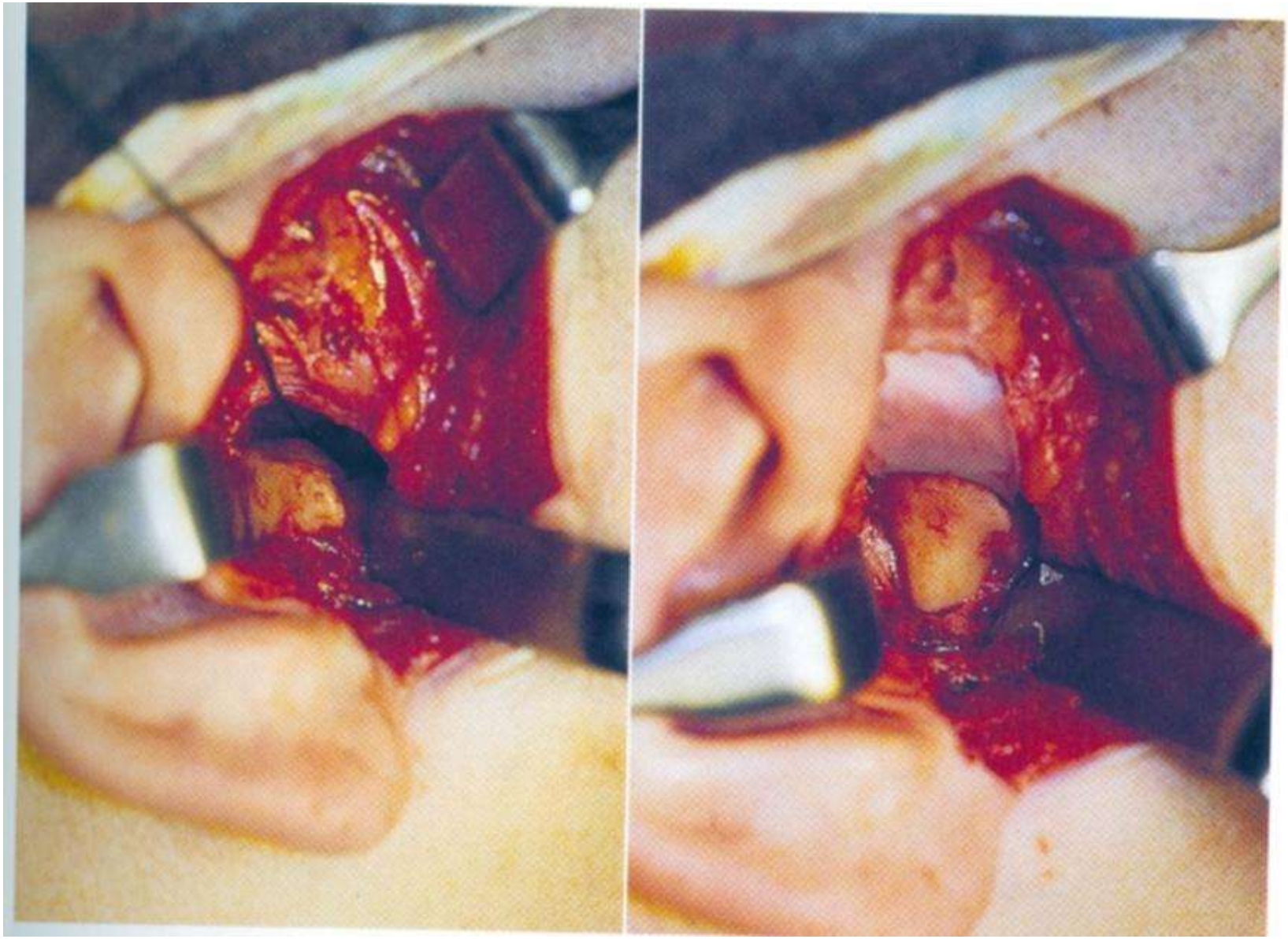
MENISECTOMY

When disc is irreparable.

Central avascular portion is removed

Taking care for damage to internal maxillary artery

Most common cause is perforation of disc

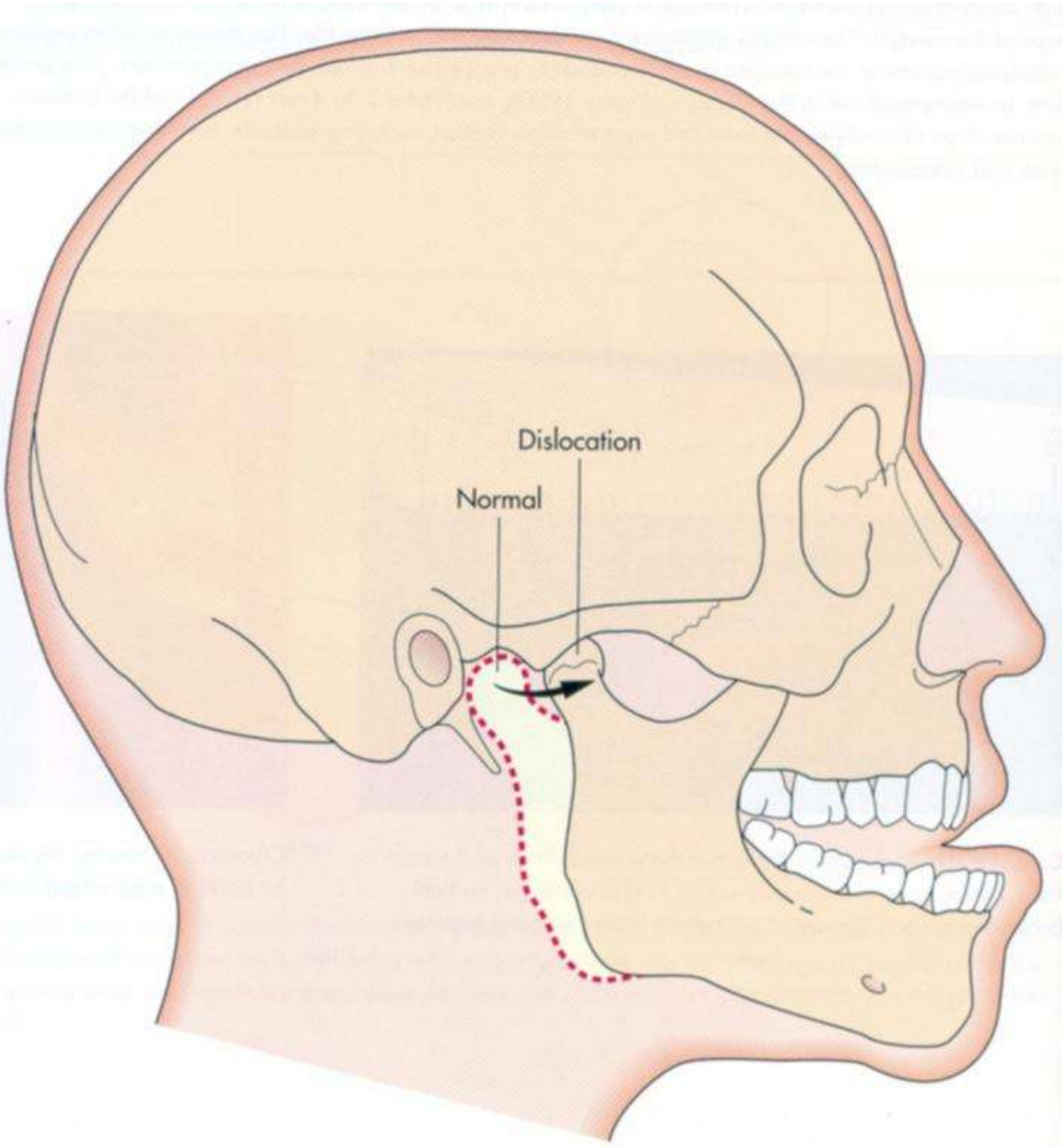


EMINNECTOMY

“ Normal maximal Translation of condyle as point where greatest convexity of condyle meets greatest convexity of Articular eminence”

- RECURRENT DISLOCATION

Side view of a skull depicting the position of the condyle anterior to the eminence in dislocation. *Dislocation* implies complete separation of the articular surfaces of the condyle and articular eminence. Subluxation is partial separation of these surfaces and is self-reducing. In unilateral dislocation, there should be deviation of the midline to the contralateral side with an ipsilateral open bite.



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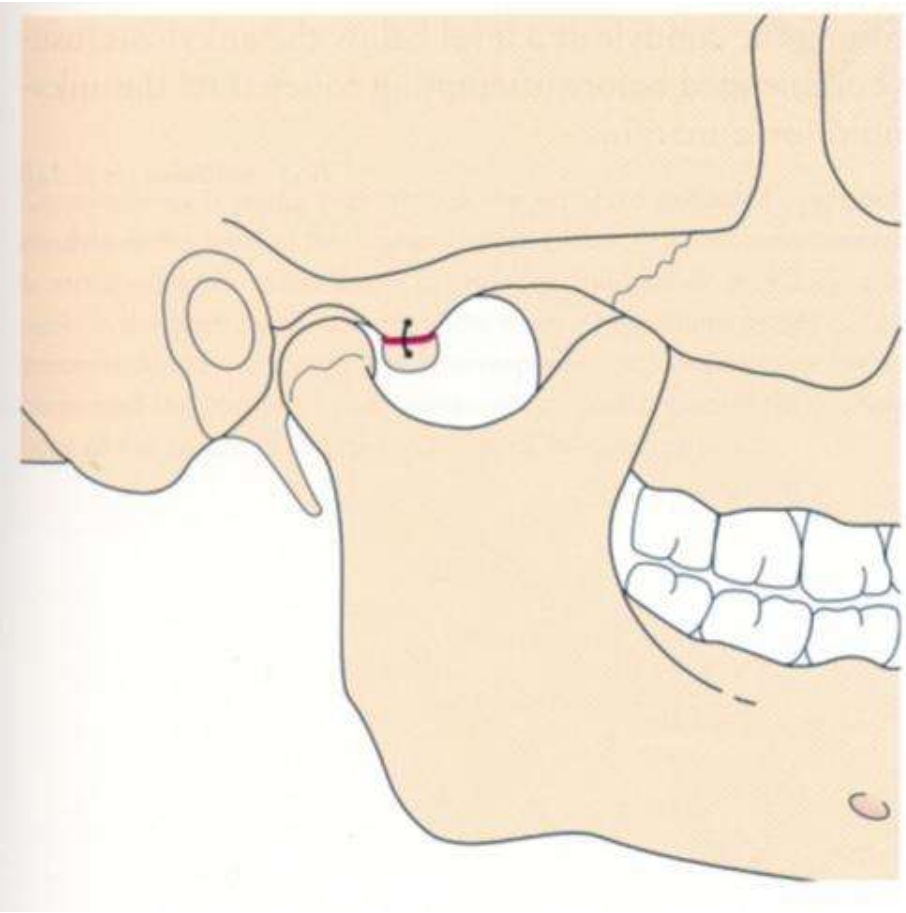

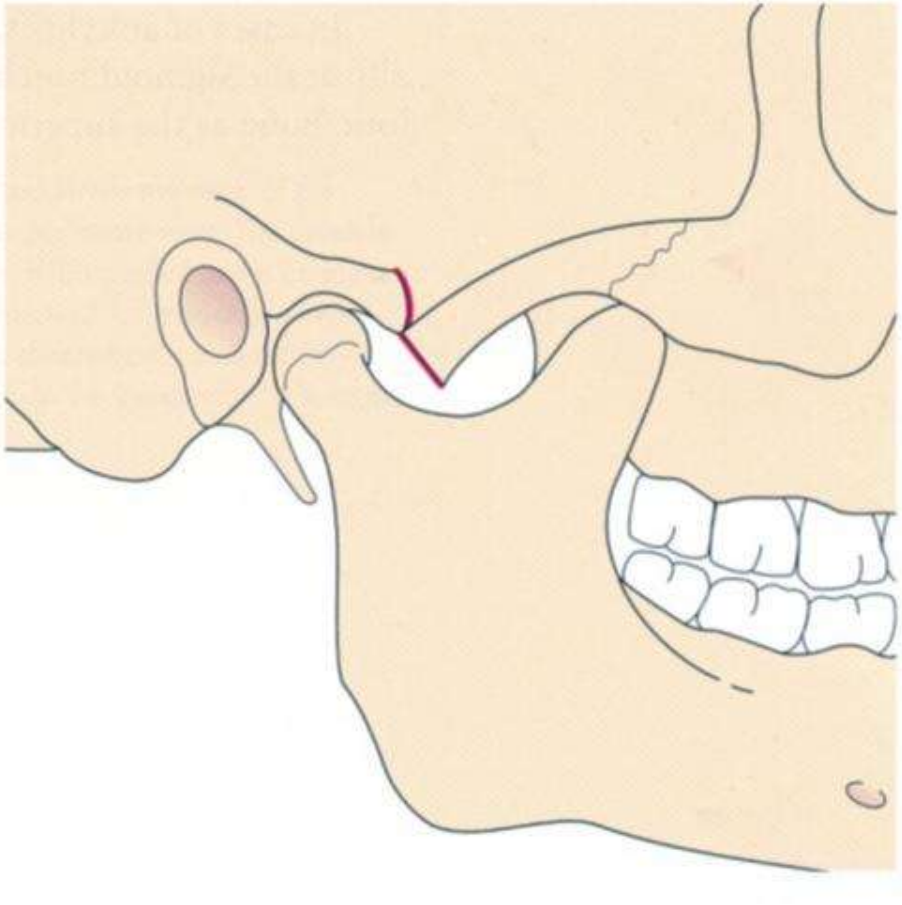

Thank you