Physical Injuries Of Oral Cavity

DEPARTMENT OF ORAL AND MAXILLOFACIAL PATHOLOGY & ORAL MICROBIOLOGY

Contents

- Physical injuries of teeth
  - Bruxism
  - Fracture of teeth
  - Cracked tooth syndrome
  - Abrasion
  - Injury to supporting structure of teeth
  - Tooth ankylosis

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- Sialolithiasis
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- Rhinolithiasis

PHYSICAL INJURIES OF TOOTH

- 1. Bruxism
  - It is habitual grinding or clenching of the teeth either during sleep or as an unconscious habit during waking hour.
  - Incidence : 5% to 20%

Etiology

- 1. Local
- 2. Systemic
- 3. Psychologic
- 4. Occupational

- 1. Local factors –
  - Occlusal disturbance
  - Mild discomfort and chronic tension
  - An attempt to establish the maximum teeth in occlusion

- 2. Systemic factors
  - Gastrointestinal disturbance
  - Subclinical nutritional deficiency
  - Allergy
  - Endocrine disturbance

- 3. Psychological factors
  - Most common cause
  - Patient suffering psychological problems of fear, rejection etc.

- 4. Occupation
  - Occupation like watchmaker etc.
  - Habituated chewers of tobacco, chew gum, tooth pick, pencil.

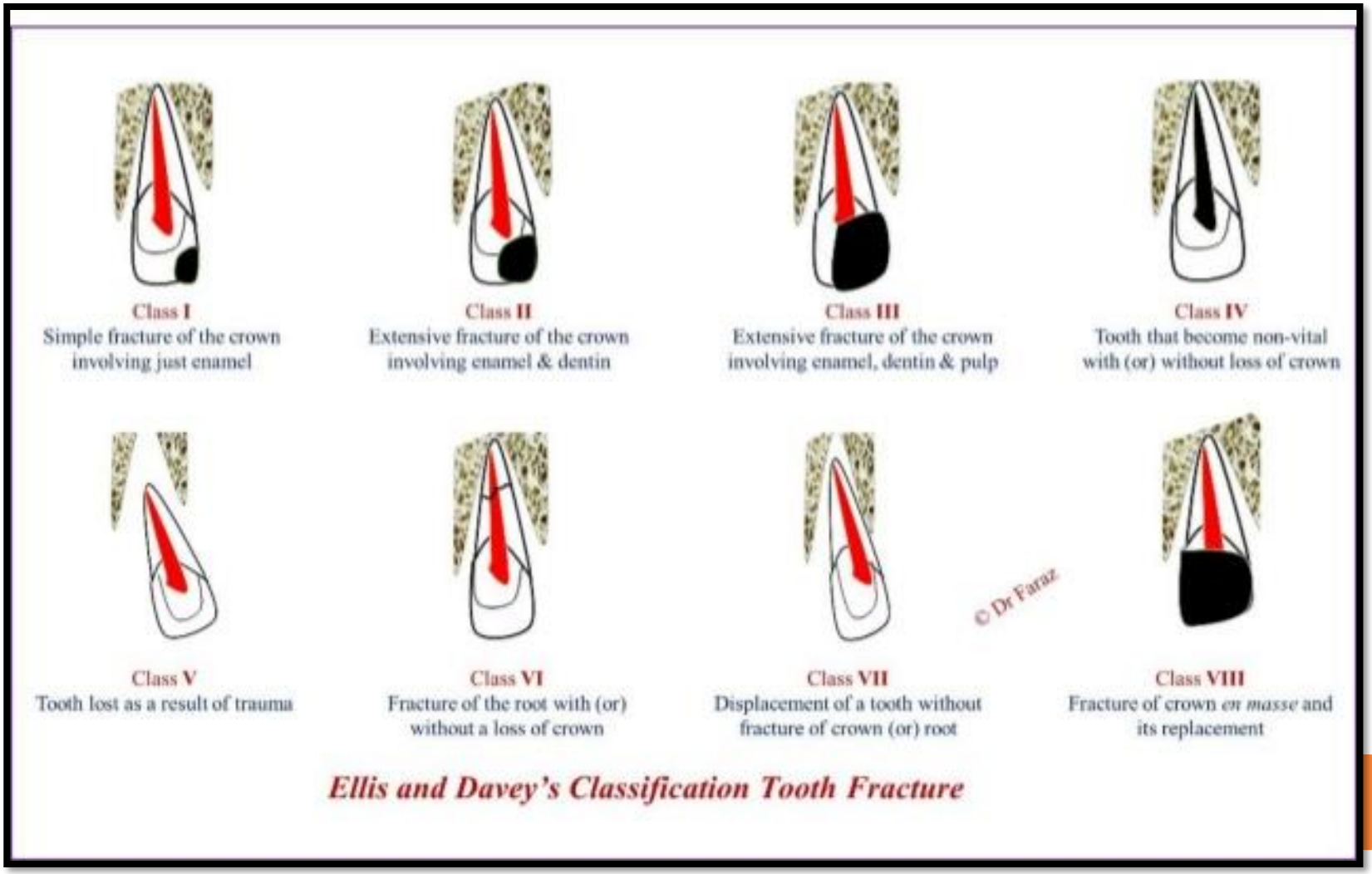
- Clinical features :
  - Patient make a grating/ grinding noise.
  - Effects on dentition: occlusal facets
  - Effects on periodontium : loss of intigrity resulting drifting of teeth and gingival recession.
  - Effect on masticatory muscle : hypertrophy and trismus.
  - Effect on TMJ : altered closing and opening movement.
  - Headache
  - Psychological and behavior alteration.

Treatment

- Treatment of psychological cause
- Prosthesis with splints

2. Fracture of teeth

- Cause :
  - Trauma
  - Fall, Blow, automobile accident
  - Tooth weakened by large restoration leaving thin wall or unsupported cusp under stress of mastication.


Class I
Simple fracture of the crown involving just enamel
Class II
Extensive fracture of the crown involving enamel & dentin
Class III
Extensive fracture of the crown involving enamel, dentin & pulp
Class IV
Tooth that become non-vital with (or) without loss of crown
Class V
Tooth lost as a result of trauma
Class VI
Fracture of the root with (or) without a loss of crown
Class VII
Displacement of a tooth without fracture of crown (or) root
Class VIII
Fracture of crown en masse and its replacement
© Dr Faraz
Ellis and Davey's Classification Tooth Fracture

Ellis and devey classification (1960)

Class 1	Enamel fracture
Class 2	Enamel and dentin fracture without pulp exposure
Class 3	Fracture involving enamel dentin and pulp exposure
Class 4	Nonvital
Class 5	Avulsion
Class 6	Root fracture without involving crown structure
Class 7	Displacement of teeth without fracture of the crown
Class 8	Loss of crown en mass
Class 9	Trauma to deciduous teeth

3. Cracked tooth syndrome

- Is characterized by sharp pain, on chewing without any obvious reason which is actually caused by hidden crack of the tooth
- These are incomplete fractures that are too small to be seen on radiograph.
- Typical symptoms :
  - Sharp fleeting pain when releasing biting pressure.

- Cause :
  - Attrition
  - Bruxism
  - Trauma
  - Accidental bite on a hard subject
  - Improper endodontic treatment

3. Abrasion

- Pathological wearing away of tooth substance through some abnormal mechanical process.
- Cause :
  - Abrasive dentrifrice
  - Improper brushing method
  - Habitual opening of bobby pin
  - Notching may be noted in carpenter, shoe maker, tailor
  - Habitual pipe smoker

- Clinical features :
  - V shaped notch in cervical part of teeth.
  - Degree of loss is greater on prominent teeth cuspid, bicuspid
  - Occasionally more advanced on the side of arch opposite dominant hand

5. Injuries to supporting structures of teeth

- 1. Concussion
  - It is defined as injury to the supporting structure of tooth without abnormal loosening or displacement of teeth but with significant reaction to percussion.
  - C/F :
    - Diffuse ache
    - Little discomfort
    - Tooth may feel numb after blow
    - Teeth Respond normally to sensitivity test

- 2. Subluxation :
- Injury to supporting structure of tooth resulting in abnormal loosening of tooth without any displacement.
- C/F :
  - Tooth mobile on palpation
  - Sensitive to percussion
  - Bleeding from gingival crevice
  - Teeth respond normal to sensiti

- 3. Avulsion :
- Complete displacement of tooth from its socket.
- It can be partial or total
- Partial avulsion may include
  - Intrusion
  - Extrusion
  - Facial, lingual, palatal or lateral displacer

6. Tooth ankylosis

- Fusion between tooth and bone.
- Cause :
  - Traumatic injury
  - Pulpal infection
  - Followed by root canal therapy
  - More common in reimplanted
- C/F :
  - Dull muffled sound on percussion rat
    sharp sound

- Radiographic features :
  - Loss of pdl space
  - Mild sclerosis of bone
  - Apparent blending of bone with tooth root

Physical injury of bone

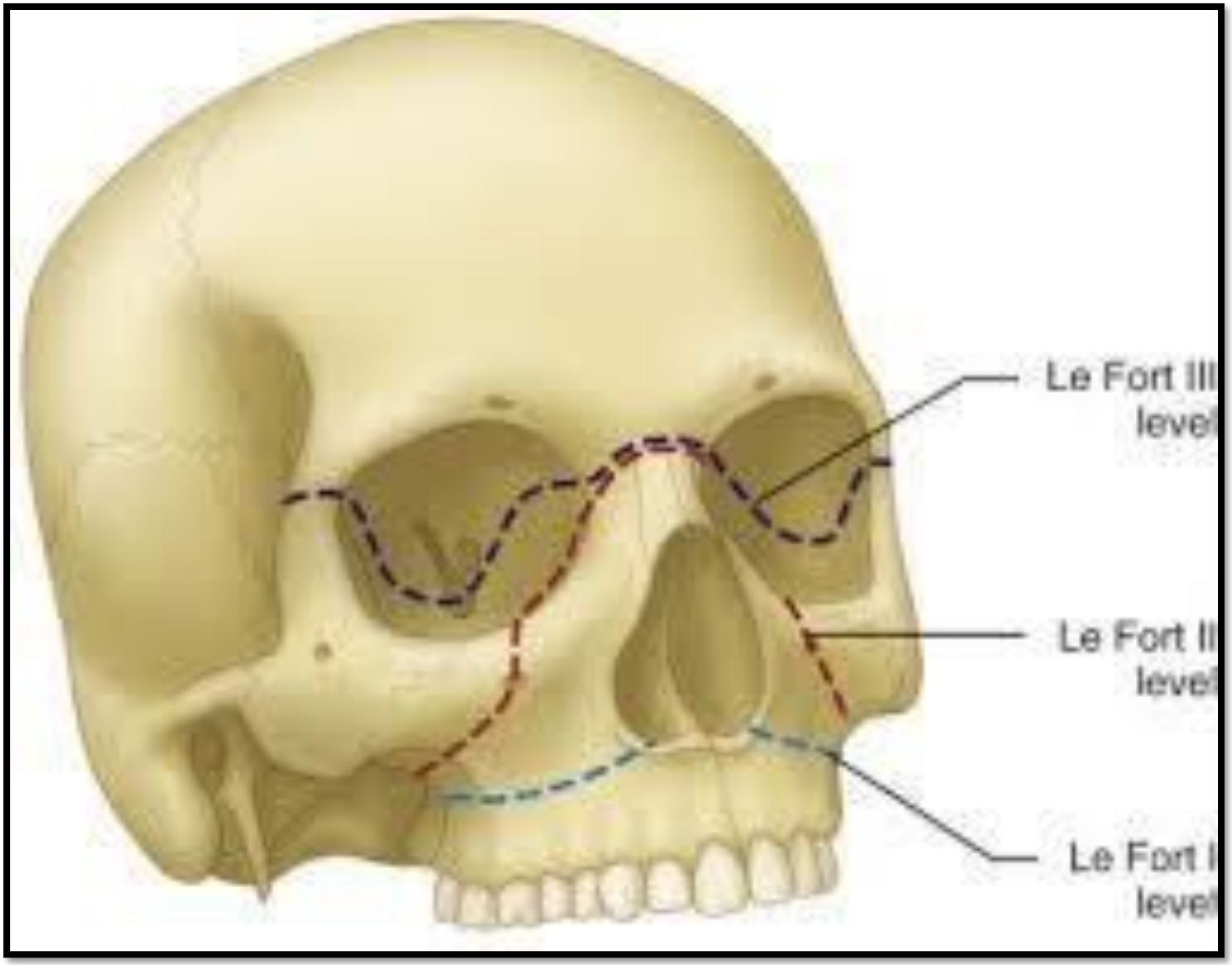
- Fracture of jaw
  - simple
  - Compound
  - Comminuted
  - Greenstick

- Fracture of maxilla
- Fracture of mandible

- Mandible is more prone to fracture since chin is more prominent feature of face.
- Fracture of jaw is common in male.

Fracture of maxilla

- Lefort I Fracture:
  - Also called Horizontal or Floating fracture
  - Characterized by separation of body of maxilla from the base of the skull, below the level of zygomatic process.


Le Fort III
level
Le Fort II
level
Le Fort I
level

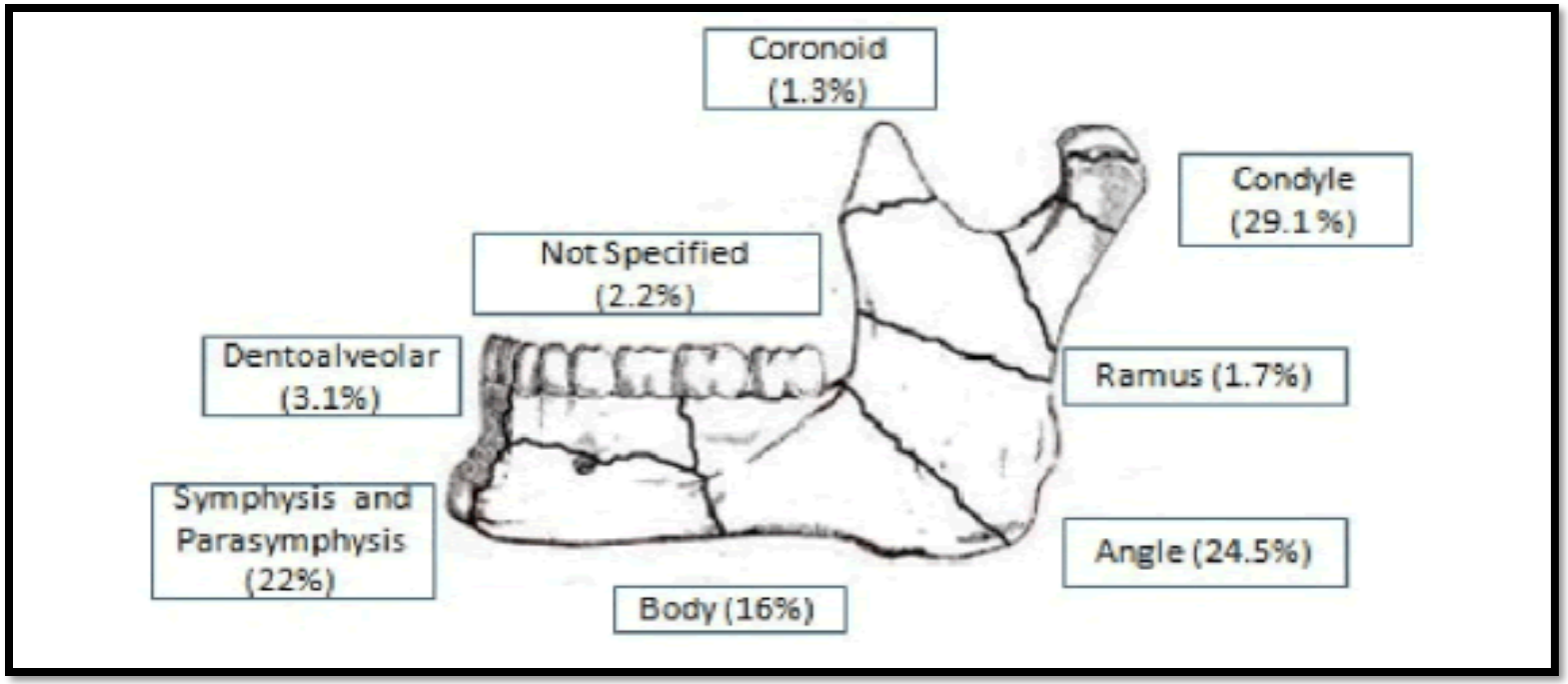
- Lefort II Fracture:
  - Also called pyramidal fracture
  - Characterized by vertical fracture through the facial aspect of maxilla and extend upward to the nasal and ethmoidal bones and usually extend through maxillary sinus.

- Lefort III Fracture:
  - Also called Transvers fracture
  - High level fracture that extend across the orbit through base of nose and ethmoidal region to the zygomatic arch.

Mandibular Fracture

- Most commonly involve Angle of mandible, followed by condyle, molar region, mental region, symphysis
- Clinical Feature:
  - Pain during movement
  - Occlusal derangement
  - Abnormal mobility
  - Gingival laceration
  - Crepitus on movement

- Trismus
- Loss of sensation of involve side
- Ecchymosis



Traumatic cyst

- It is a pseudo cyst
- It is unusual benign, empty, fluid filled lesion which occurs with considerable frequency in the jaws and other bone as well.

- Etiology:
  - Some theories have been proposed:
  - The trauma-hemorrhagic theory
  - Origin from bone tumors undergoing cystic degeneration
  - Result of faulty calcium metabolism(parathyroid disease)
  - Origin from necrosis of fatty marrow due to ischemia
  - The end result of a low grade chronic infection
  - A result of osteoclasis resulting from isturb circulation cause by trauma creating an unequal balance of osteoclasis and repair of bone.

Clinical Feature:

- Second decade of life
- Male > Female
- Posterior mandible
- Usually Asymptomatic

- Radiographic Feature:
  - Radiolucent area with thin sclerotic border , depending upon duration of lesion
  - A lobulated or sclerotic appearance extending between root of tooth

- Histological Feature:
  - Thin connective tissue membrane lining the cavity
  - Extensive osteophytic reaction on the outer surface of cortical plate
  - Presence of few blood pigment , red blood cells, or giant cells adhering the bone surface.

- Treatment:
  - The cavity should be surgically opened and bleeding should be initiated
  - No second surgical intervention generally required
  - Sometimes they are self limiting.

Focal osteoporotic bone marrow defect of jaw

- Is an uncommon lesion producing the focal radiolucency away from normal hematopoietic marrow.
- Bone marrow may stimulate in response to unusual demands for increased blood cell production.
- This marrow spread between bone trabeculae and give radiolucent appearance.

- This is because of osteoporosis and thinning of cortex
- Aberrant bone regeneration may also be a cause for the same.

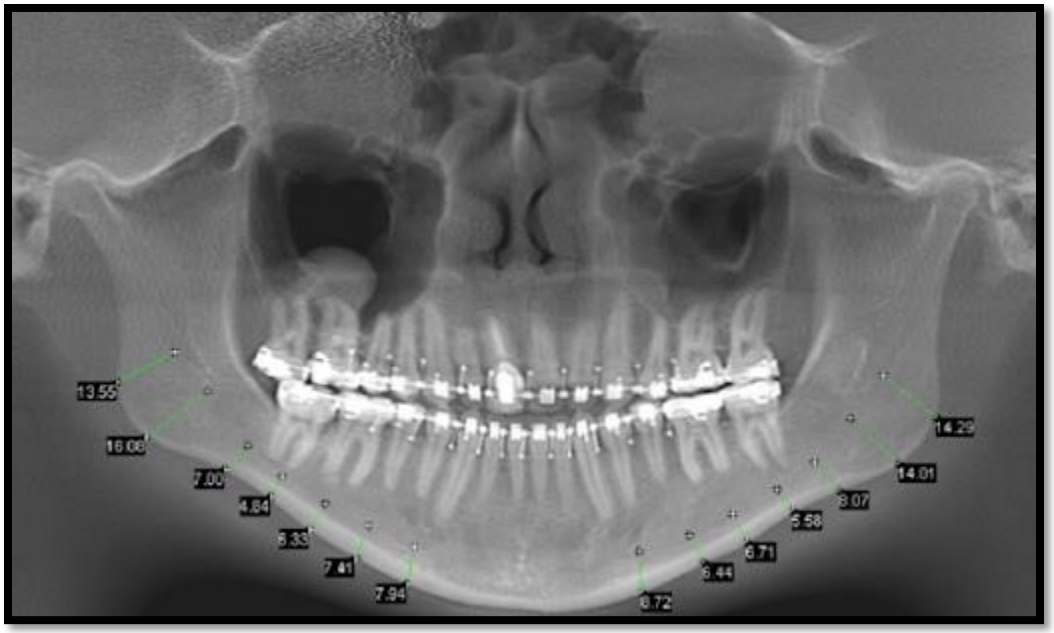
- Clinical Feature:
  - Asymptomatic
- Radiographic Feature:
  - Poorly defined periphery indicative of lack of reactivity of adjacent bone.
- Histological Feature:
  - Show red bone marrow or fatty marrow or both
  - Long, thin, trabeculae with absence of osteoblastic layer.

- Treatment:
  - Surgical excision for diagnosis
  - Once diagnosed no treatment is necessary.

Surgical ciliated cyst of maxilla

- Due to caldwell-luc operation or obstruction of ostium
- Is an implantation type of cyst in which epithelium of maxillary sinus entrapped along the line of surgical entry into the sinus and subsequently proliferates to form true cystic cavity.

- Clinical Feature:
  - Complain of nonspecific poorly localized pain, tenderness, or discomfort in the maxilla
  - Extra oral or intra oral swelling
  - When content of mucocele is infected the lesion is called mucopyocele.



- Radiographic Feature:
  - Well defined unilocular radiolucent area closely related to maxillary sinus
- Histological Feature:
  - Lined by pseudo sratified ciliated columnar epithelium
  - Infection, inflammation or squamous metaplasia may be found
- Treatment:
  - Enucleation of cyst

Effects of orthodontic tooth movement

- Tipping movement
- Extrusive movement
- Intrusive movement
- Tissue reactions during retention period
- Effects of deciduous tooth movement on permanent teeth

Physical injuries of soft tissues

1. LINEA ALBA

- White line seen on the buccal mucosa extending from the commissures posterioly at the level of occlusal plane.
- Caused by physical irritation and pressure exerted by the posterior teeth.
- Usually bilateral.
- More pronounced in persons having clenching habit or bruxism.
- Histologically – Hyperkeratosis and intracellular edema of epithelium is seen.

Fig. Linea alba

2. TOOTHBRUSH TRAUMA

• Occurs to gingiva and produced by toothbrush
• Appears as white ,reddish or ulcerative lesions or linear superficial erosions, involving marginal or attached gingiva of maxillary canine and premolar region.

➢ HISTOLOGICAL FEATURE

• Focal ulceration with formation of granulation tissue with diffuse chronic inflammatory cell infiltration
• Epithelium shows hyperkeratosis and acanthosis adjacent to the ulcers

➢ TREATMENT

• Symptomatic treatment
• Teaching proper brushing technique

Fig. Penetrated injury caused by tooth brush.

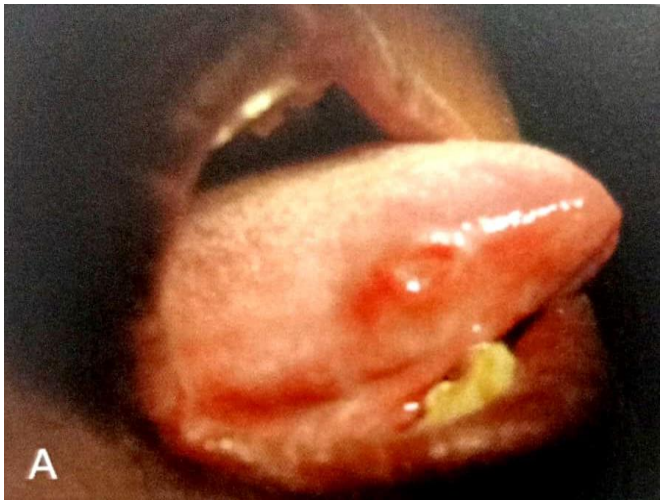


Fig. A. Traumatic ulcer of the tongue caused by sharp tooth.

Fig. B. Traumatic ulcer of the lip.

Fig. C. Traumatic ulcer of the lower lip caused by othodontic appliace.

➢ TREATMENT :

• No treatment is required as these ulcers heal within 7 to 10 days.
• Symptomatic relief can be provided by lgnocaine or any other topical anesthetic gel.

3. TRAUMATIC ULCERS (DECUBITUS ULCERS)

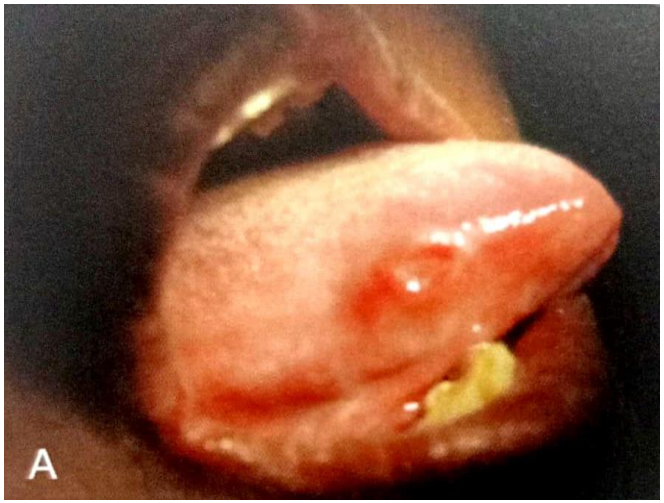
- Ulcers of mucous membrane formed due to traumatic injury.

➢ **MOST COMMON SITES ARE :**

- Lateral borders of tongue
- At occlusal level of teeth in buccal mucosa
- Lips

➢ **TRAUMA MAY BE DUE TO :**

- Sharp teeth
- Cheek or lip biting.



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4. FACTITIAL OR SELF INDUCED INJURIES

- **MAY INCLUDE :**
  - Lip biting (morsicatio labarum)
  - Cheek biting (morsicatio buccarum)
  - May be habitual, accidental or psychological

- **LIP & CHEEK BITING**

• Holding, biting & tearing of epithelium of lip, buccal mucosa, or tongue, chewing of cheek or stripping of epithelium using fingers &creating negative pressure by sucking the lips and cheeks

• Gingiva may also be involved

Fig. Factitial injury.

➢ CLINICAL FEATURES

• Usually bilateral along the occlusal line &vestibular surface of lips
• Mucosa appears white & shredded with areas of redness
• Ulceration is common
• More prominent in females

➢ HISTOLOGICAL FEATURES

• Extensive areas of hyperkeratosis with keratin projections
• Chronic inflammatory cell infiltration seen in areas of ulcerat

➢ TREATMENT

• Counseling & psychotherapy are treatment of choice
• An acrylic shield will help to prevent the access of teeth to lips & cheeks

5. DENTURE INJURIES

- Caused by denture wearing
- **CAN APPEAR AS :**

a) Traumatic ulcer(sore spots)
b) Generalized inflammation (denture sore mouth, Denture Stomatitis)
c) Inflammatory (fibrous) hyperplasia (denture injury tumor, epulis fissuratum, redundant tissue)
d) Inflammatory papillary hyperplasia (Palatal papillomatosis)
e)Denture base intolerance or Allergy

a) TRAUMATIC ULCER (SORE SPOTS)

- CAUSED DUE TO:
  - either sharp spicules of bone or high spot on inner aspect of denture
  - Over extended flanges may also cause sore spots at

- CLINICAL FEATURES
  - Ulcers are small, painful & irregular
  - covered by grey necroting membrane

- TREATMENT
  - Correction of underlying cause
  - Relief of the flange
  - Removal of high spots

b) GENRALIZED INFLAMMATION (DENTURE SORE MOUTH,DENTURE STOMATITIS)

- Characterized by burning erythematous granular mucosa, restricted to area beneath the denture

- CAUSES
  - Candida albicans
  - Saliva retention in glands

• TREATMENT

- Not successful
- Denture surface is covered with topical nystatin coating
- For oral condition nystatin tablets (500,000IU) should be dissolved in mouth *TDS8 1d days

c) INFLAMMATORY (FIBOROUS) HYPERPLASIA (DENTURE INJURY TUMOR, EPULIS FISSURATUM, REDUNDANT TISSUE)

- One of the most common tissue rxn to a chronically ill-fitting denture
- Occur on buccal mucosa gingiva & angle of mouth

Fig. Inflammatory hyperplasia

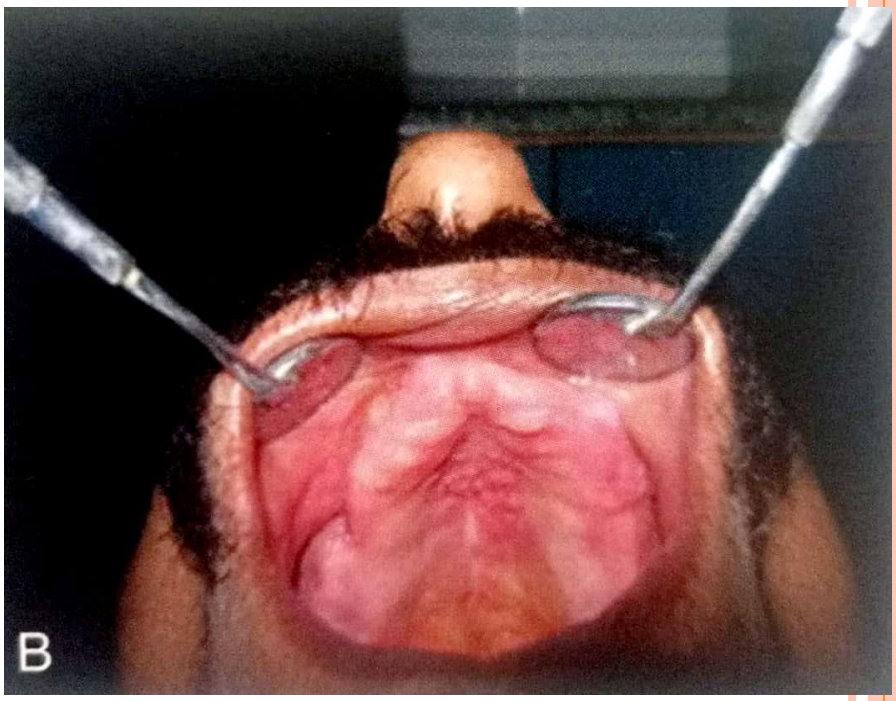

Fig. Papillary hyperplasia of patients in A.) Dentulous and B.)Edentulous patients

- CLINICAL FEATURES

- Mucolabial or mucobucal folds may develop excessive enlarged folds of tissue

- HISTOLOGICAL FEATURES

- Excessive fibrous connective tissues
- Hyperkeratosis is present
- Pseudoepitheliomatous hyperplasia is often found
- Connective tissue is composed of coarse bundles of collagen fibers with new fibroblasts or blood vessels

• HISTOROGICAL FEATURES

- Papillary projections of keratinized stratified squamous epithelium with vascular connective tissue present

• TREATMENT

- Construction of new denture

e) DENTURE BASE INTOLERANCE/ALLERGY

• Allergy may be due to denture base material as in cobalt chromium alloy, it may be due to nickel or in vulcanite dentures, it may be due to **Sulphur**

• CLINICAL FEATURES

- Generalized inflammation of area in contact with denture

• TREATMENT

- First determine the cause of allergy then reconstruct the denture with minimal or no use of that material

6. SIALOLITHIASIS (SALIVARY DUCT STONE , SALIVARY DUCT CALCULUS)

- A stone in salivary ducts or glands is called sialolithiasis
- Formed by deposition of calcium salts around a central nidus (formed by bacteria, debris, foreign bodies or epithelial cells)

➢ CLINICAL FEATURES

- Severe pain occurs during meal time especially when eating citrus fruits
- Salivary gland is painful & swollen
- On palpitation stone may be detected in ducts

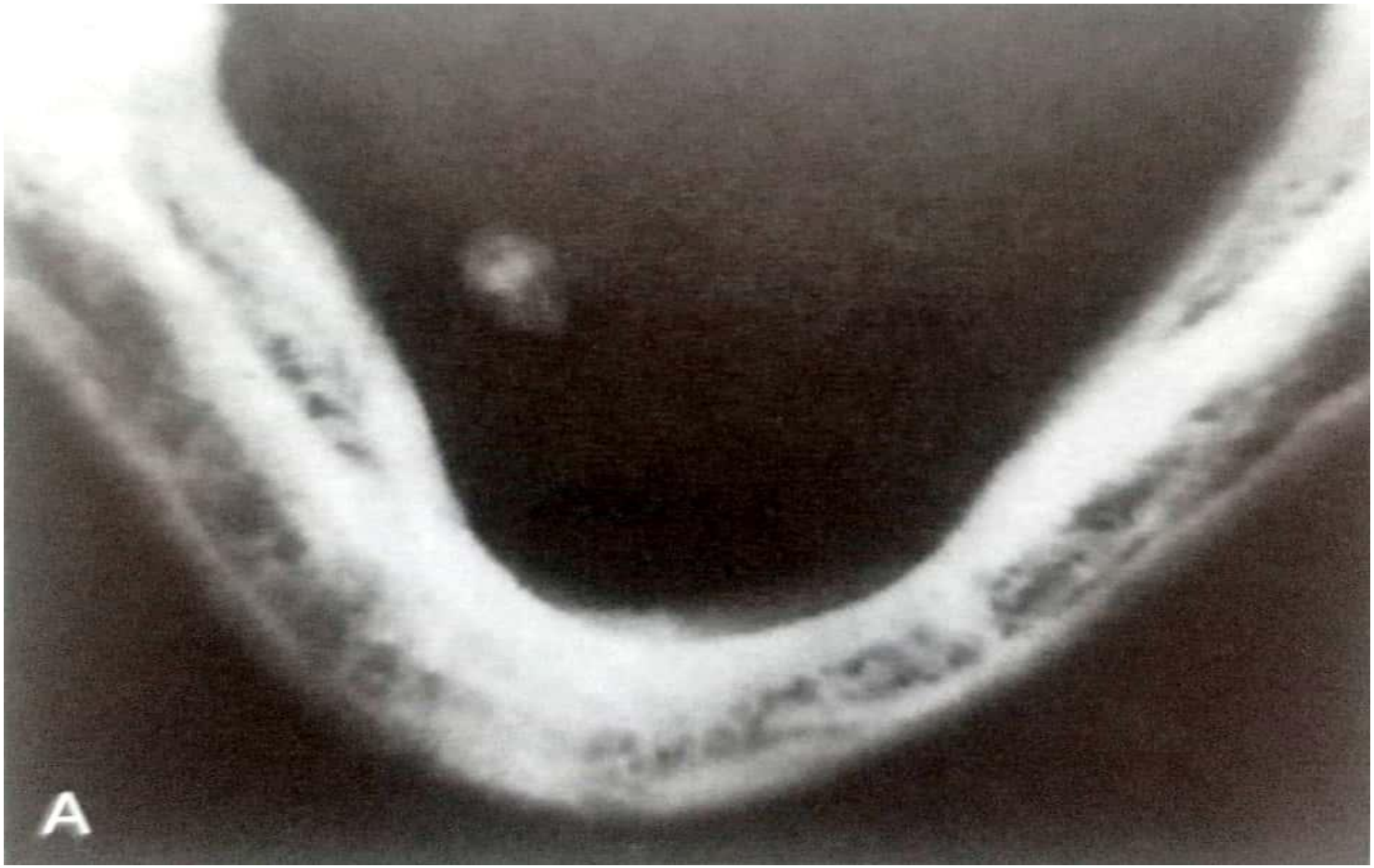

Fig. **Sialolithiasis.** A piece of calculus in the submandibular gland duct is shown in the occlusal radiograph

• Sialolithiasis is found mostly in submandibular gland because of:

- **Tortuous path** of Wharton's duct
- **Mucinous secretion** of the gland
- **Gravitational effect** of the saliva inside duct

➢ CHEMICAL & PHYSICAL FEATURES

- Round ,ovoid or elongated
- Measure just a few millimeters or 2 cm more in diameter
- Involved duct contain single or multiple stones
- Surface of calculi is rough ,which may cause squamous metaplasia of duct lining
- Usually yellow & occasionally white or yellowish-brown in color
- Calculi consist of calcium phosphates & smaller amount of calcium carbonates , organic materials & water

➢TREATMENT & DIAGNOSIS

- Small calculi may sometimes be manipulated or increasing the salivation by sucking a lemon, leading to expulsion of stone
- I. V. injection of antibiotic like nafcillin is given for bacterial infection due to persistent obstruction of duct
- Larger stones require surgical removal
- Piezoelectric shock wave lithotropsy is alternative to surgical removal

7. MAXILLARY ANTROLITHIASIS (Antral rhinolith)

- Rare condition
- Defined as complete or partial calcific encrustation of an antral foreign body, either endogenous or exogenous, which serves as a nidus
- Endogenous nidus consist of a dental structure such as a root tip or may simply be a fragment of soft tissue, bone, blood or mucous.
- Exogenous nidus is uncommon but may consist of snuff paper

➢ Clinical features

- Occur at any age in either sex
- May be a complete absence of symptoms
- Some cases are marked by pain, sinusitis, nasal obstruction, foul discharge and epistaxis

TREATMENT

- Antrolith should be surgically removed

8. RHINOLITHIASIS

- Are calcareous concretions occurring in the nasal cavity
- This uncommon lesion is formed by calcification of intranasal endogenous or exogenous foreign material
- Reported in all ages
- May present for years and frequently give rise to odorous discharge, symptoms of nasal obstruction, sinusitis epiphora as well as pain and epistaxis

Thank You !