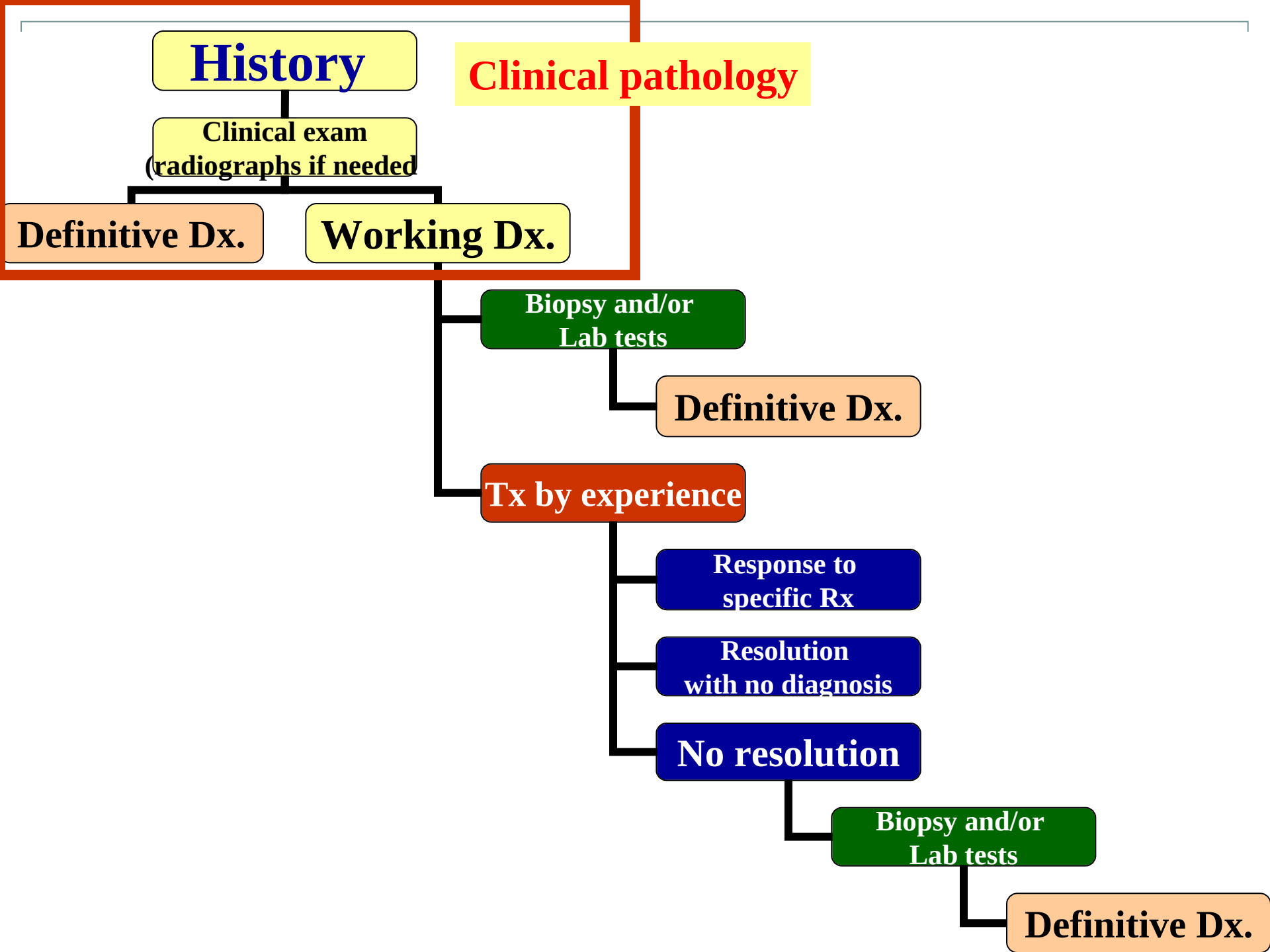
General principles of Differential Diagnosis

1. History and examination of the patient
2. The diagnosis sequence

Clinical pathology, a study of change

Purpose: overview of significance and application of medicine in the dentistry

The dentist does not only treat “teeth in patients “ but patients who have teeth or not”.


History
Clinical pathology
Clinical exam
(radiographs if needed
Definitive Dx.
Working Dx.
Biopsy and/or
Lab tests
Definitive Dx.
Tx by experience
Response to
specific Rx
Resolution
with no diagnosis
No resolution
Biopsy and/or
Lab tests
Definitive Dx.

IN the history taking, you have to do

1. To identify—undetected systemic disease
2. To identify —taking drug or medicine as clue
3. To modify– treatment planning
4. To protect –medical-dental legal standpoint
5. To communicate –medical consultants
6. To establish –good patient-dentist relation ship

The Diagnostic Sequence

1. Detection and examination of the lesion
2. Examination of the patient
   - Chief complaints
   - Onset and course
3. Re-examination of the lesion
4. Classification of the lesion
5. Listing the possible diagnosis
6. Developing the differential diagnosis
7. Working diagnosis
8. Final diagnosis

1. RECORDING THE IDENTIFYING DATA
2. HISTORY AND PHYSICAL EXAMINATION
3. CHIEF COMPLAINT
4. PRESENT ILLNESS
5. PAST MEDICAL HISTORY
   - Family history
   - Social history
   - Occupational history
   - Dental history
6. REVIEW OF SYMPTOMS BY SYSTEM
7. PHYSICAL EXAMINATION
   - Radiologic examination
8. DIFFERENTIAL DIAGNOSIS
9. WORKING DIAGNOSIS
10. Medical laboratory studies
11. Dental laboratory studies
12. Biopsy
    - Incisional
    - Excisional
    - Fine-needle aspiration
    - Exfoliationg cytology
    - Toludine blue staining
13. Consultation
14. FINAL DIAGNOSIS
15. TREATMENT PLAN

1. Detection and examination of the patient's lesion

- History taking
- Inspection
- Palpation
- Percussion
- Aspiration,
- Auscultation
- Radiographic examination
- Laboratory examination

History Taking

- What, where, when, how
  - Chief complaint
  - Present illness
- Past medical history
  - Family history
  - Social history
  - Occupational history
  - Dental history
- Review of symptoms by system
- Physical examination
  - Radiographic examination

Chief complaint(s)

1. Pain
2. Soreness
3. Burning sensation
4. Bleeding
5. Loose teeth
6. Recent occlusal problem
7. Delayed tooth eruption
8. Dry mouth
9. Too much saliva
10. Swelling
11. Bad taste
12. Halitosis
13. Parthesia and anesthesia

1.Pain

-- Location, sharp or dull, severity, duration, precipitating circumstances

- Teeth
- Mucous membrane
- Salivary gland inflammation or infection
- Lesions of the jaw bone
- LN inflammation and /or inflammation
- TMD, MPD
- Sinus diseases
- Ear diseases
- Psychoses
- Angina pectoris, neuralgia …

2.Soreness

-presence of mucosa inflammation or ulcers

3.Burning sensation

-thinning or erosion of the surface epi.

- Burning mouth syndrome
  - Xerostomic condition
  - Anemia
  - Vitamin deficiencies…
- Psychosis
- Neurosis
- Viral, fungal or chronic bacterial infection

(Burning mouth syndrome)

- Gender effects : F:M = 3:1 ~ 7:1
- Age: Middle-aged and elderly-aged

Local and systemic preciptating factors:

- Hematinic deficiency state
- Undiagnosed maturity onset diabetes
- Oral candidal infection
- Xerostomia
- Denture design faults
- Parafunction habits
- Cancerphobia
- Allergy
- Psychological state
- Drug induced
- Hypothyroid function

- (cancerphobia)

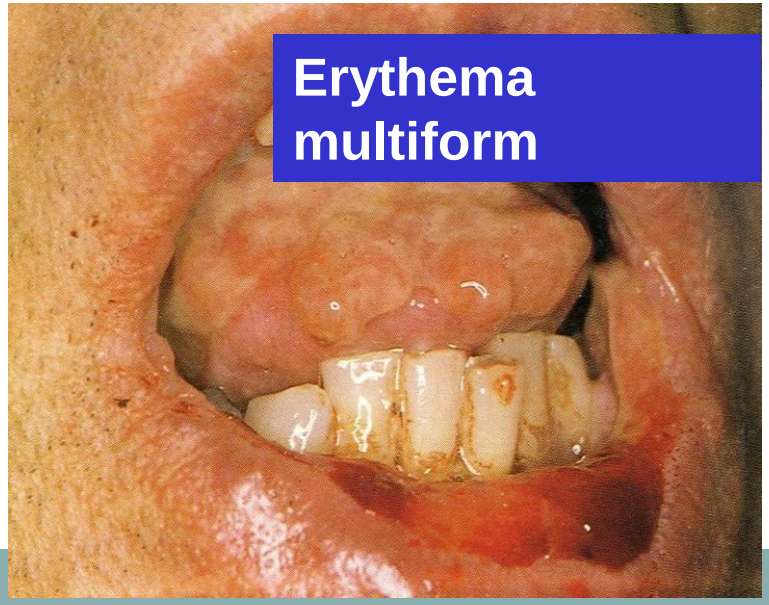
Vit. B_{12} defficiency
(Pernicious anemia)

After tx.

4.Bleeding

- Gingivitis and periodontal disease
- Traumatic incidence, surgery
- Inflammation
- Tumors (traumatized tumor or vascular tumors)
- Diseases associated with deficiencies in hemostasis

Bleeding



5.Loose teeth

-Loss of supporting bone or resorption of roots

- Perio. Problem
- Trauma
- Pulpoperiapical lesions
- Normal resorption of primary teeth
- Benign tumors-root resorption
- Malignant tumors-supporting bone destruction

6.Recent occlusal problem

-recently teeth don't bite right or recently teeth are out of line

- Overcontoured restorations
- Periodontal disease, periapical abscess
- Traumatic injury, tooth fracture
- Tumor or cyst of tooth-bearing regions of the jaws
- Fibrous dysplasia…

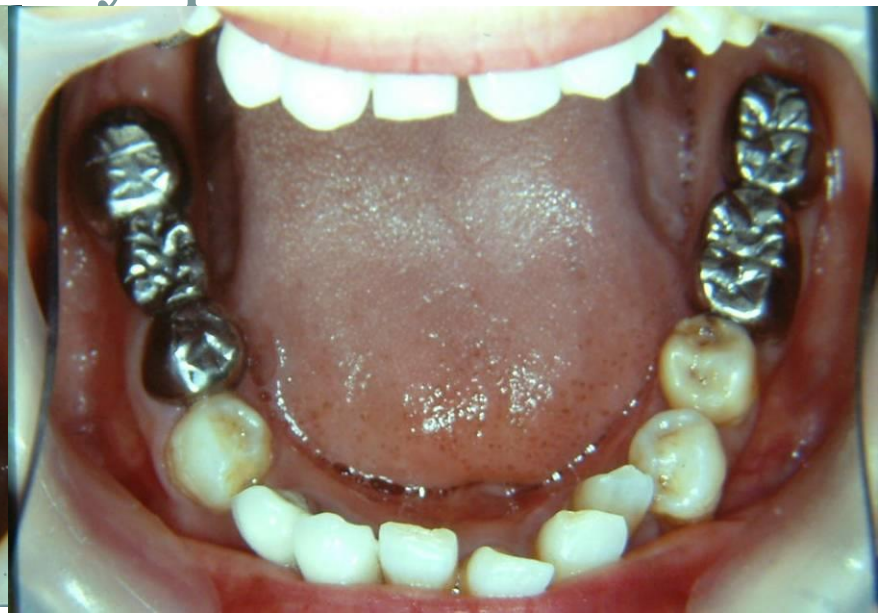
7.Delayed tooth eruption

- Malposed eruption or impacted teeth
- Cyst
- Odontomas, mesiodens
- Sclerotic bone
- Tumors
- Maldevelopment
- Generalized delay…anodontia, cleidocranial dysplasia or hypothyroidism

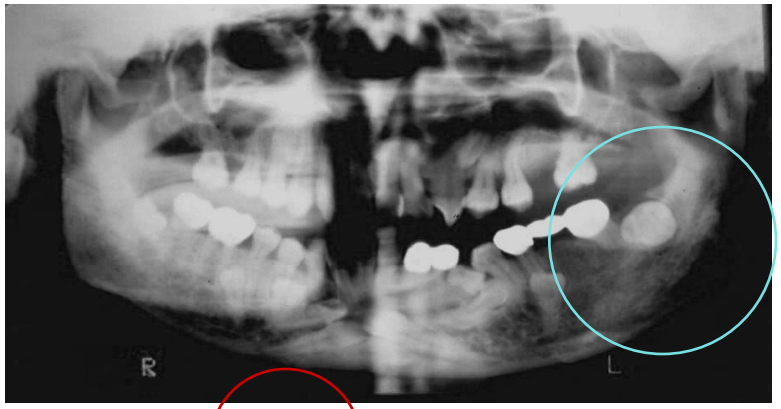
Delaved tooth eruption

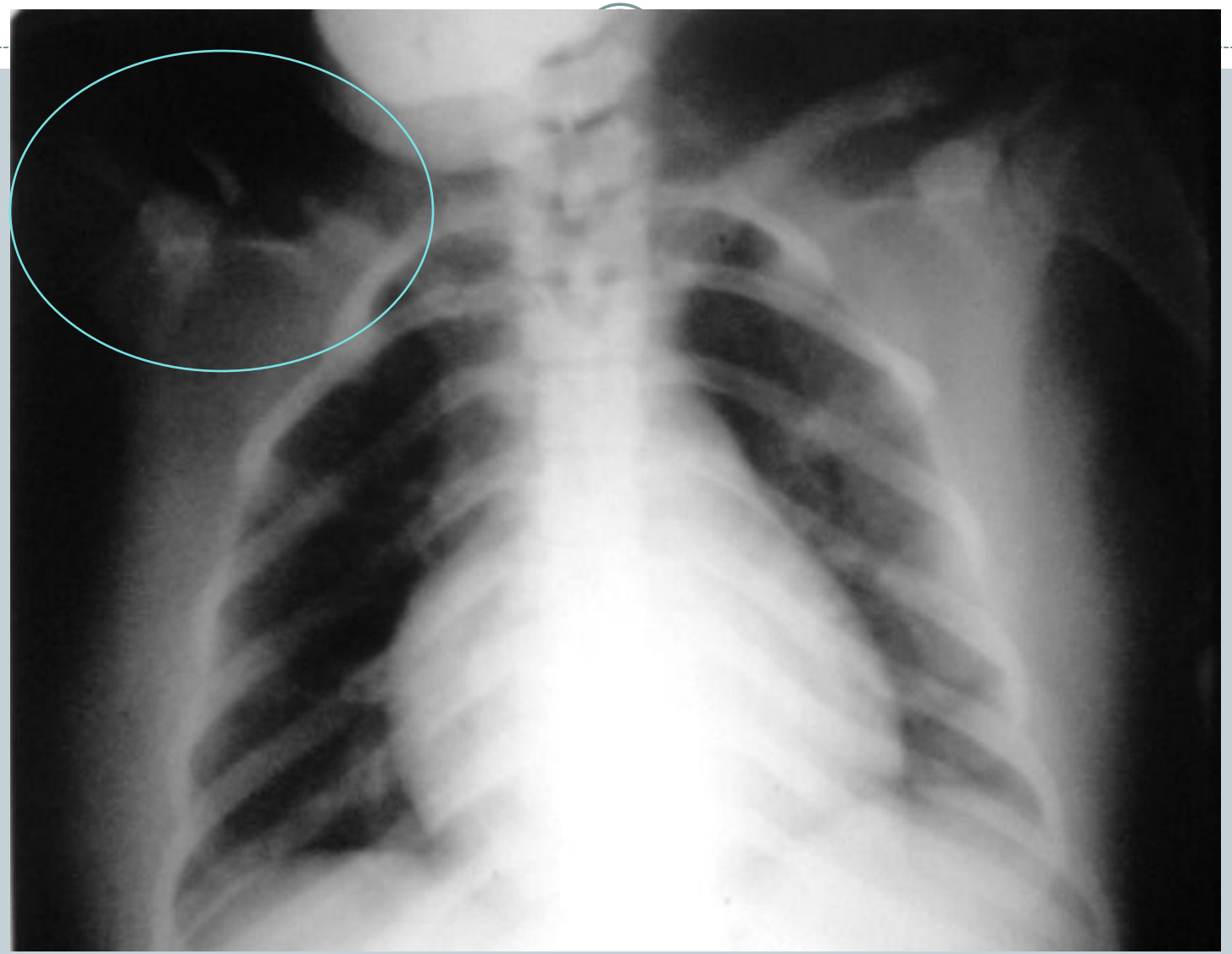
Cleidocranial Dysplasia

Cleidocranial Dysplasia



Cleidocranial Dysplasia





8.Dry mouth

- Local inflammation
- Infection and fibrosis of salivary gland
- Dehydration state
- Drug therapy
  - Tranquilizers
  - Diuretics
  - Antihistamines
  - Anticolinergics
- Autoimmune diseases
- H &N radiotherapy
- Chemotherapy
- Alcoholism
- Psychosis

9.Too much saliva

-may be related to psychosomatic problem

- New denture insertion, increased or decreased vertical dimension

10. Swelling

- Inflammations and infections
- Cysts
- Retention phenomena
- Tumors

11.Bad taste

- Aging
- Heavy smoking
- Poor oral hygiene
- Dental caries
- Periodontal disease
- Dry mouth
- Intraoral malignancies

- Diabetes
- Hypertension
- Medication
- Uremia
- Neurogenic disorder
- Psychosis

12.Halitosis

Originating from :

- Oral and dental regions
- Upper respiratory tract
- Gastro intestinal causes
- Systemic causes
- Drug induced & other

Parasthesia and anesthesia

- Injury to regional nerve
  - Anesthesia needles
  - Jaw bone fracture
  - Surgical procedure
- Malignancies
- Medication
  - Sedatives, Tranquilizers, Hypnotics
- Diabetes
- Pernicious anemia
- Acute infection of the jaw bone
- Psychosis

Onset and Courses

1. Masses increase in size just before eating
   ex. salivary retention phenomena, sialolithiasis

2. Slow-growing masses (duration of months to years)
   1) Reactive hyperplasia
   2) Chronic infection
   3) Cysts
   4) Benign tumors

3. Moderately rapid-growing masses

(weeks to about 2 months)

1) Chronic infection

2) Cysts

3) Malignant tumors

4. Rapidly growing masses (hrs to days)

1) Abscess (painful)
2) Infected cyst (painful)
3) Aneurysm
4) Salivary retention phenomena
5) Hematomas

5. Masses with accompanying fever

1) Infections
2) lymphoma, leukemia

Inspection

- Contours
- Color
- Surfaces
- Aspiration

Contours

Normal & variation

Colors

Masticatory mucosa vs lining mucosa

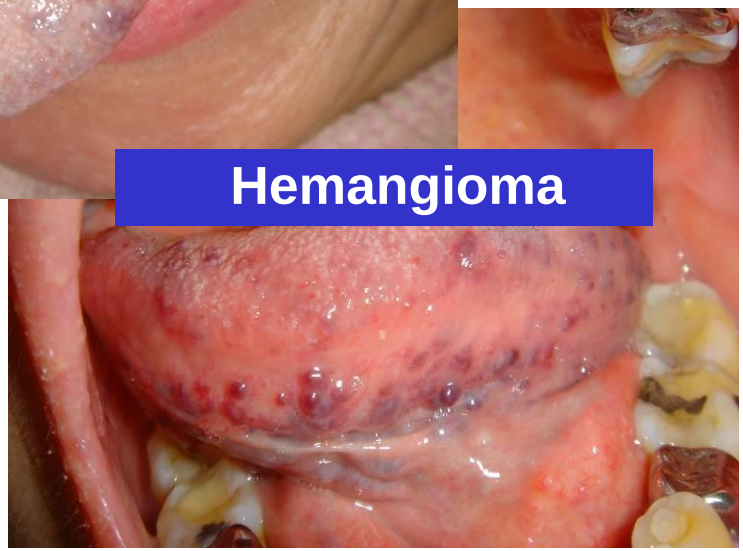
White

-thickening of epithelium or keratin

-dense fibrous tissue

ex.: leukoplakia (epi. hyperplasia, hyperkeratosis), VH, OSF

Red



Hemangioma

-thinning of epithelium

-inflammation

-increased vascularity

ex.: gingivitis, hemangioma

Yellow

-adipose tissue

-sebaceous gland

ex.: lipoma, Fordyce's granule

Fordyce's granule

Brownnish, bluish, black

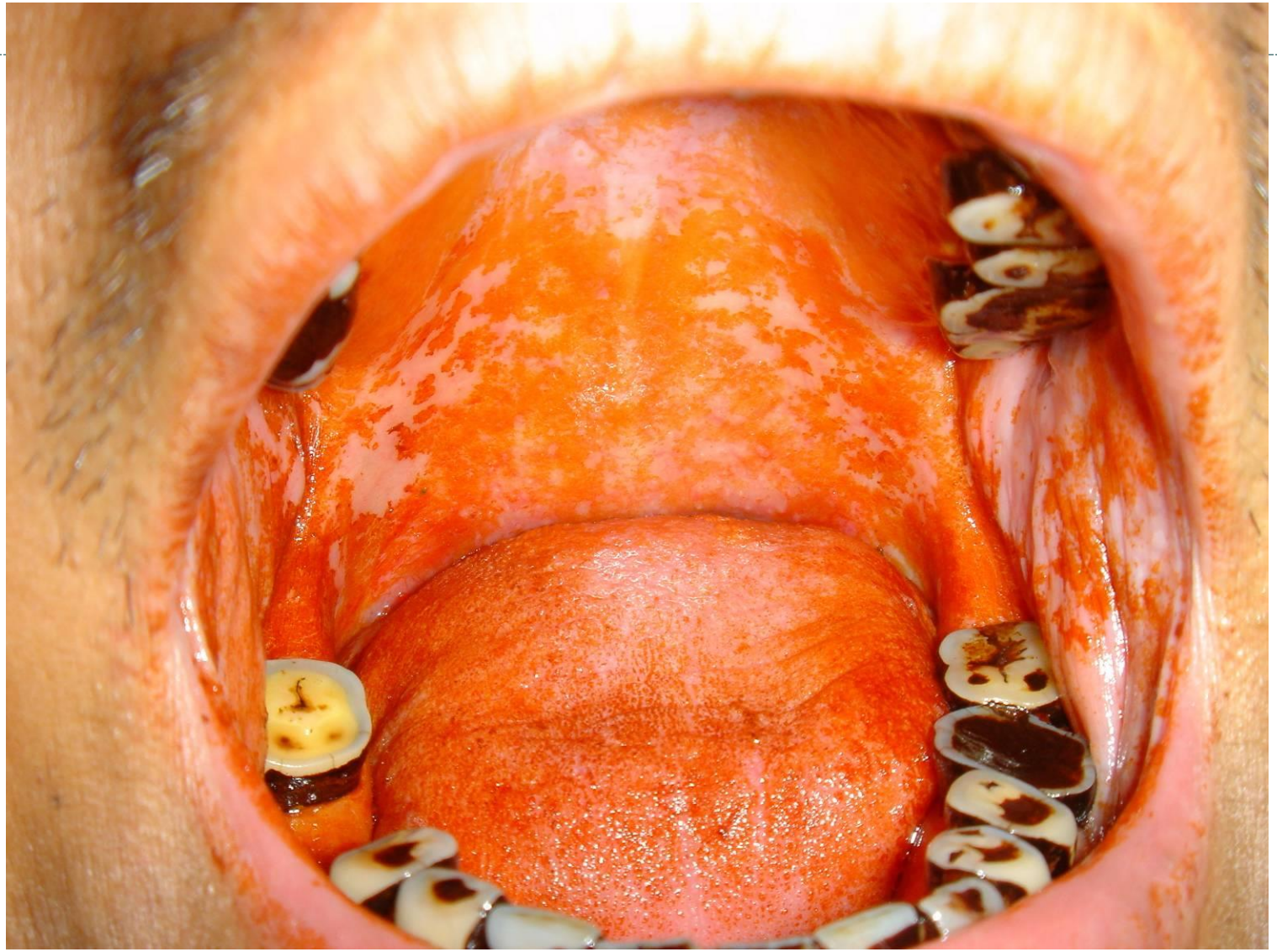
-pigmentation, melanin, hemosiderin, heavy metal, pool of clear fluid

ex: nevus, amalgam tattoo , hemangioma, mucocele

Peutz-Jegher's syndrome

mucocele

Betel nut chewer's mucosa



Surfaces

Normal --smooth & glistening,

except dorsal tongue, rugae & attached gingiva

Pathologic mass may be--

1) Smooth surface

-arises beneath epi, originates from mesenchyme

ex : benign & early malig. salivary gland tumors,
benign & malig. mesenchymal T.
(fibroma, osteoma, hemangioma,
myoma…), cellulitis, mucocele…

2) *Rough surface*

-except due to trauma, infection and malig., originates in the epithelium

Ex: papilloma, VH , V.ca, ulcerative & exophytic SCC

polypoid or papillomatous mass

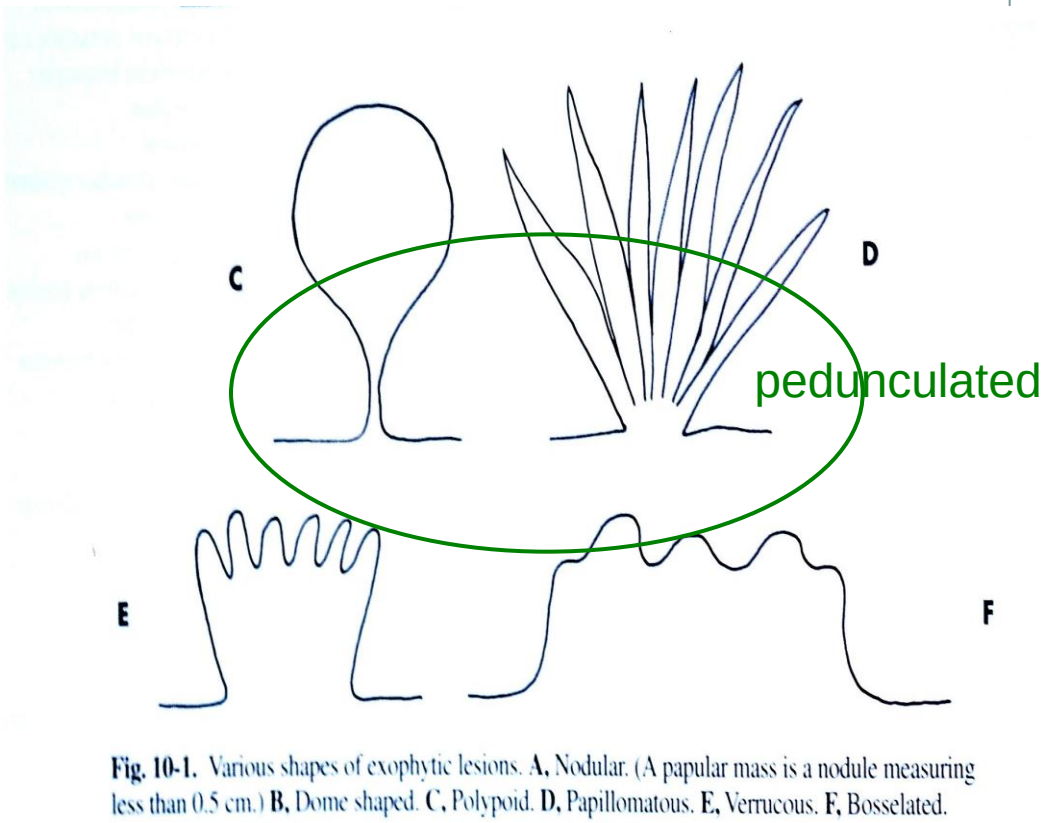


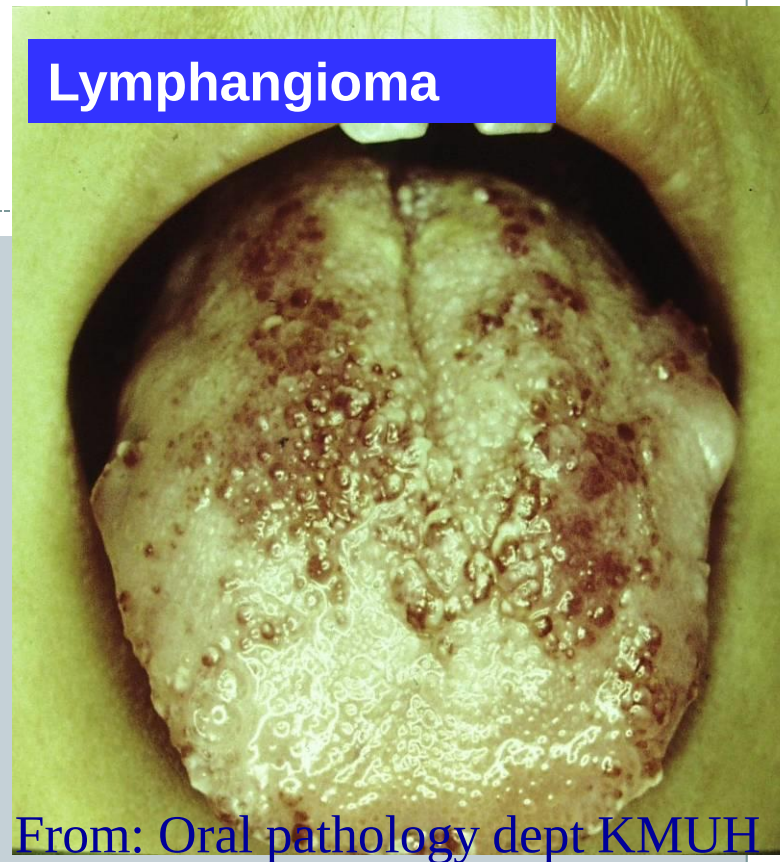
Fig. 10-1. Various shapes of exophytic lesions. A, Nodular. (A papular mass is a nodule measuring less than 0.5 cm.) B, Dome shaped. C, Polypoid. D, Papillomatous. E, Verrucous. F, Bosselated.

3)*Pebbly surface*

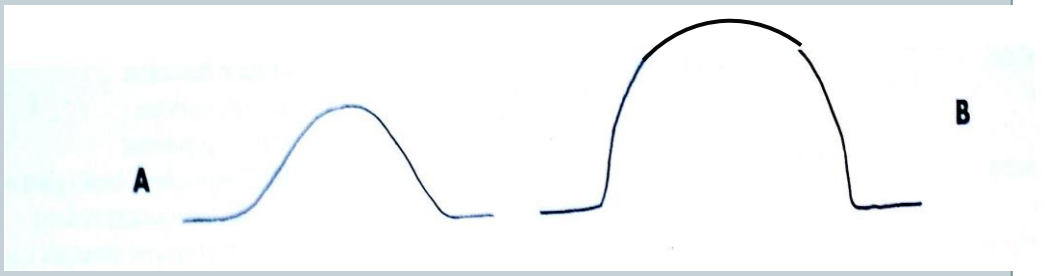
-granular cell tumor, lymphangioma

4)Flat & raised entities

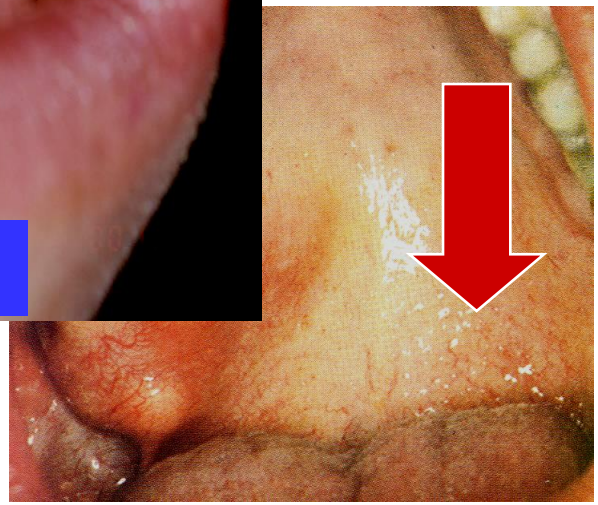
-Hyperplasia (cell number↑) & hypertrophy (cell size↑)
papule, nodule



From: Oral pathology dept KMUH



irritation fibroma



Mixed tumor

Palpation

--A third eye of clinical examination

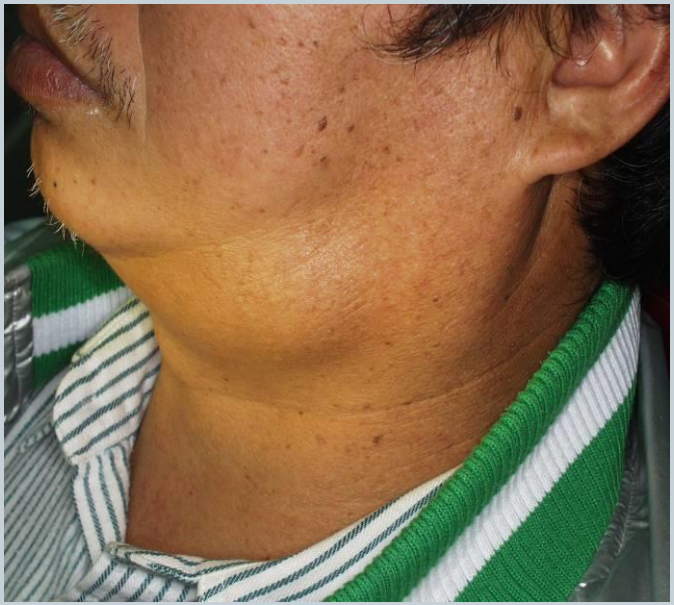
- Surface temperature
- Anatomic regions & planes involved
- Mobility
- Extent
- Size & shape
- Consistency
- Fluctuance & emptiability
- Painless, tender or painful
- Unilateral or bilateral
- Solitary or multiple

Surface temperature

- Temperature↑,
  → Inflamed or infected
  → Vascular problems, ex. aneurysm, AV shunts

Anatomic regions & planes involved

- Locates a firm mass, superficial or deep
- Difficult if swelling or painful



Mobility

1. free movable
2. fixed to skin but not to the underlying tissue
3. free movable to the skin but fixed to the underlying tissue

4. bound to both skin or mucosa and to the underlying tissue

1) fibrosis after a previous inflammation
2) *malignancy* from skin or mucosa invade to underlying tissue
3) *malignancy* from deeper tissue invade to surface epithelium
4) *malignancy* from loose CT to both the superficial & the deeper layers

Extent

- Border of a mass :

  well defined, moderate defined or poor defined
- depend on :

  -Border of the mass
  -Consistency of surrounding tissue
  -Thickness of overlying tissue
  -Sturdiness of underlying tissue

Size & Shape

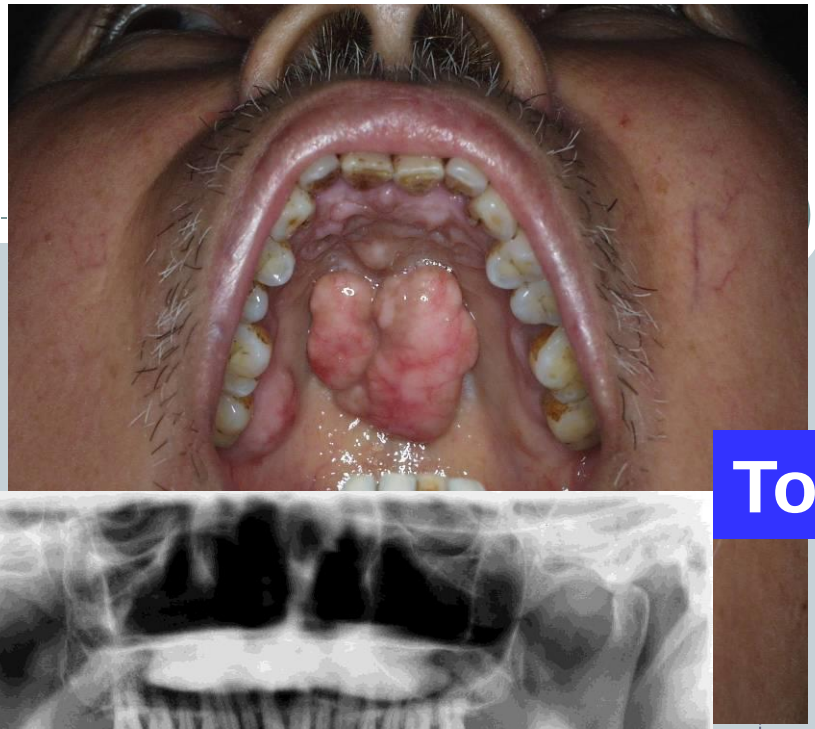
Fluctuance & emptiability

- Fluid containing lesion
- Cyst, mucocele, ranula, hemangioma

Ranula

Consistency

- Soft: vein, loose CT, glandular tissue
- Cheesy: sebaceous cyst, epidermoid cyst
- Rubbery: relaxed muscle, glandular tissue with capsule, arteries
- Firm: fibrous tissue, tensed muscle, large nerve
- Bony hard: bone, cartilage, tooth structure



Torus palatini or exostosis

Painless, tender or painful

Pain

1.inflammation-- mechanical trauma or infection

2.painful tumors--some neural tumors

3.sensory nerve encroachment

Tenderness

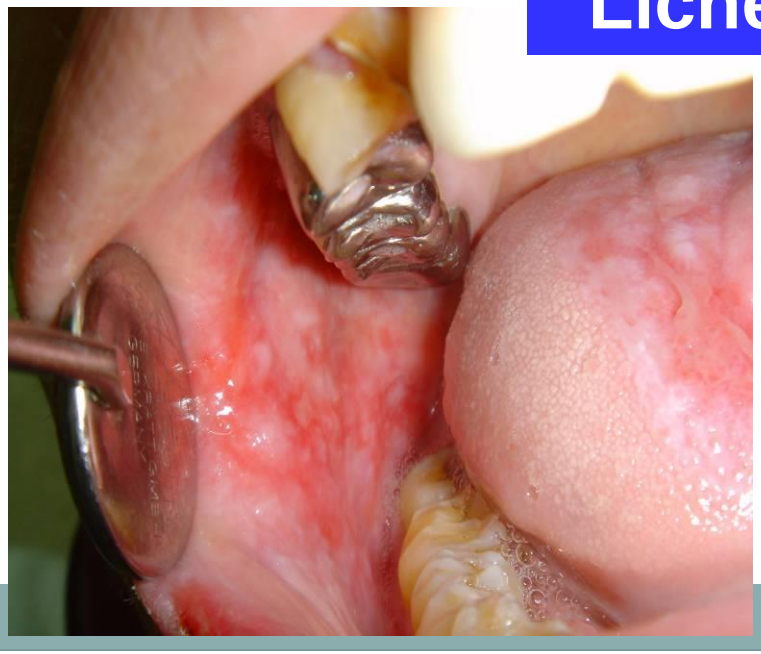
low-grade inflammation & internal pressure, chronic infection

Unilateral or bilateral

Solitary or multiple

- **Solitary : a local benign or early malignancy**
- **Multiple : systemic, disseminated diseases or syndrome**

Lichen planus

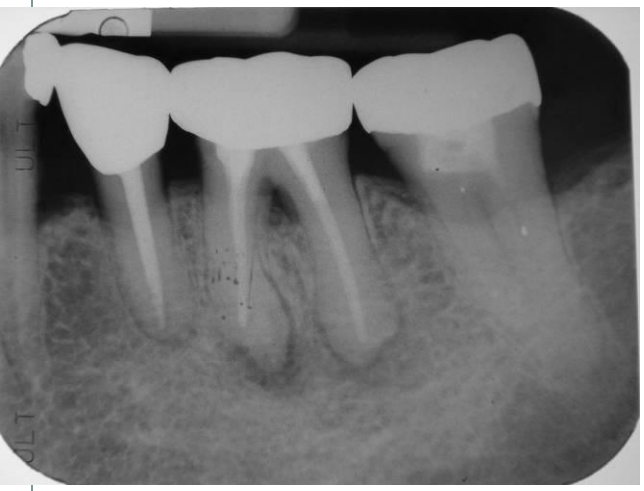


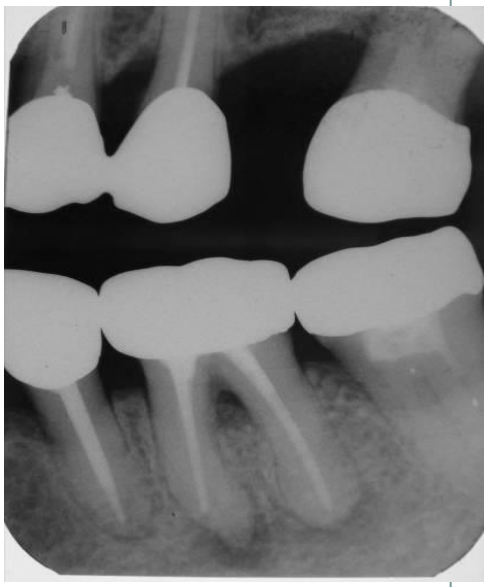
Aspiration

--Investigate the fluid contents of the lesions

- Cyst
- Tumor
  - Pus
  - Sticky, clear, viscous fluid

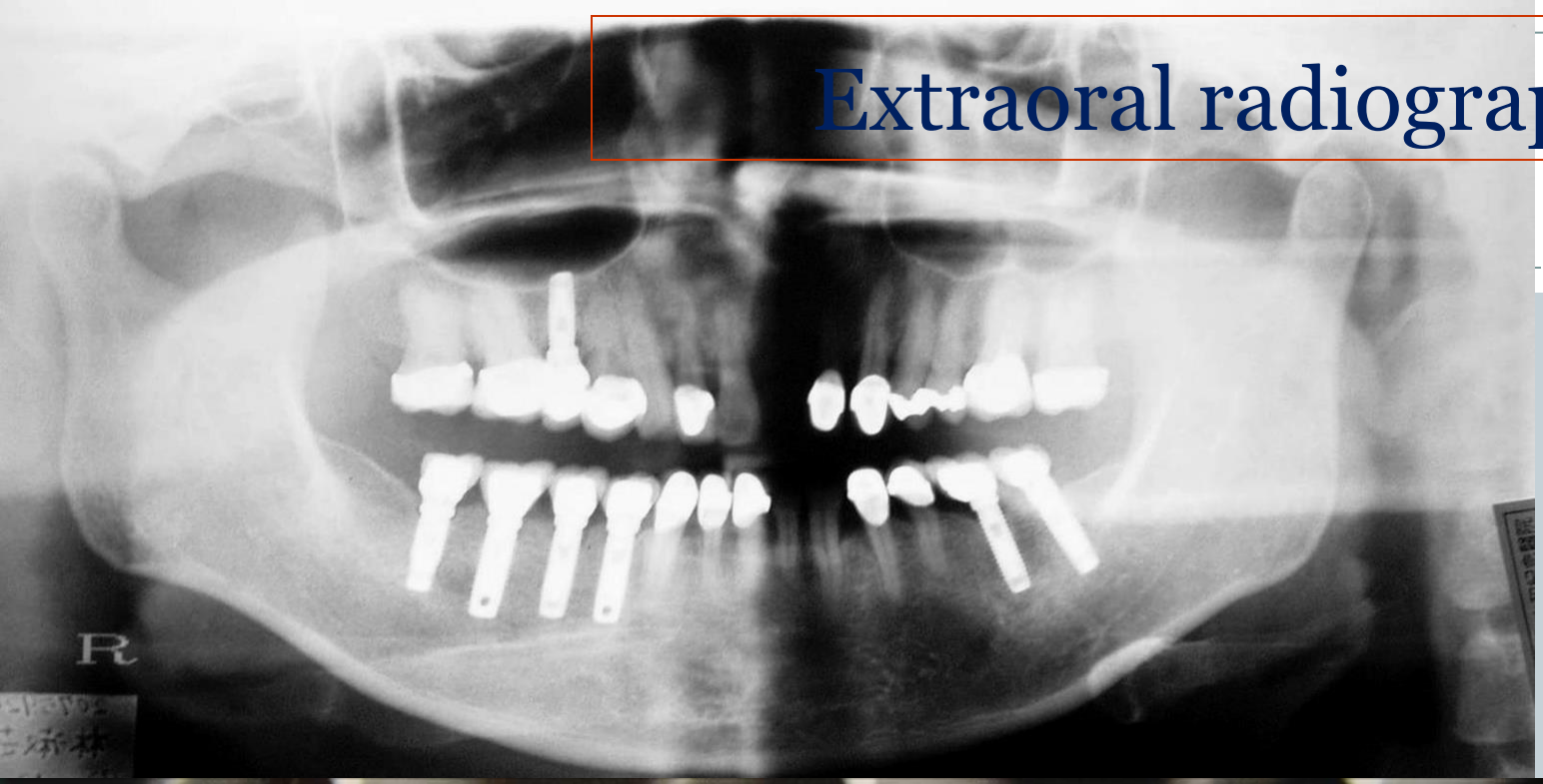
Radiographic examination

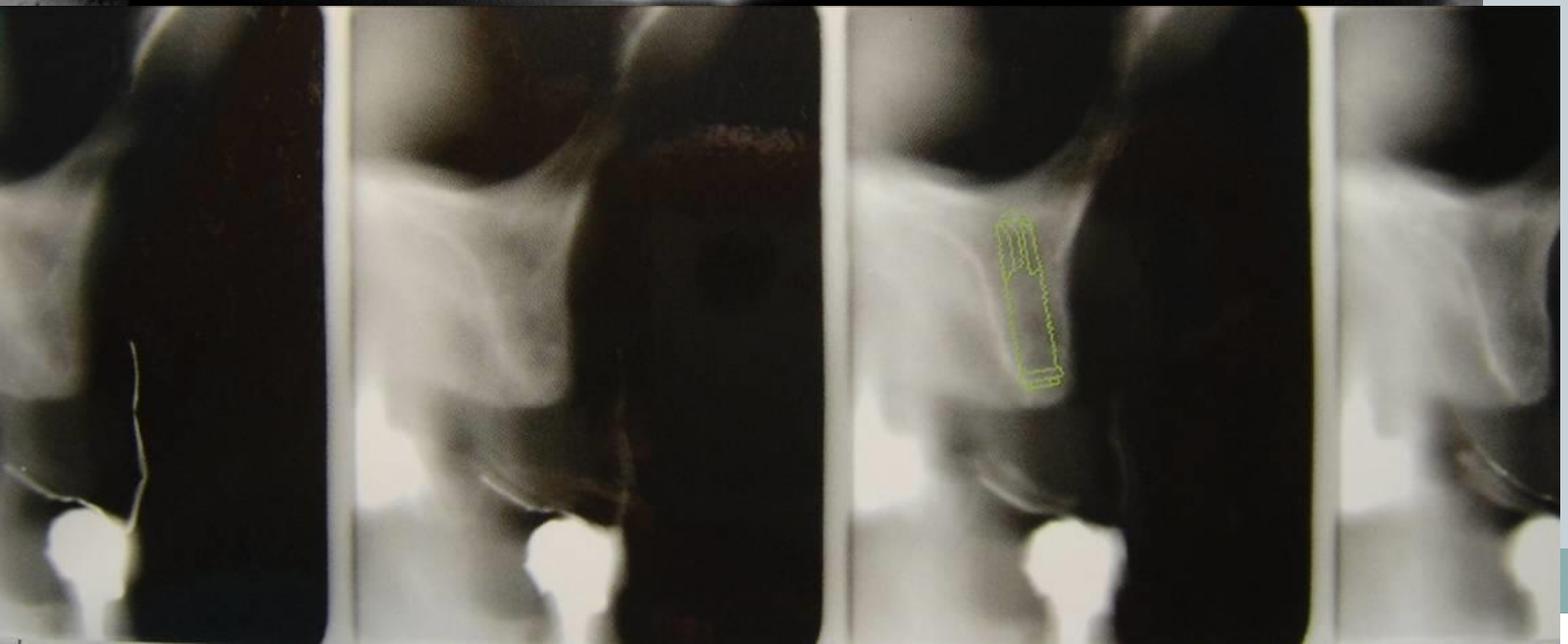




Intraoral

Extraoral radiographs






artifact

Re-examination of the lesion

- Re-evaluate his origin findings or detailed observation

Classification of the lesion

Soft tissue origin ? Bone orign?

- Subclassified: soft tissue➔white, exophytic, ulcerative, etc

  or bone lesion ➔periapical, cystic like, radiolucency, multiple separate, etc.

Listing the possible diagnosis

- Clinically and /or radiographically

Developing the possible diagnosis

- Sign—symptoms—statistical knowledge relate to the incidence of each disease entity—in order of their relative frequency of occurrence
- Age, gender, race, country of origin, anatomic location

GENDER PREDILECTION OF SOFT TISSUE LESIONS (RATIOS OR PERCENTS ARE GIVEN IN PARENTHESES)

Male

- Cancer (except minor salivary gland tumors and metastatic carcinoma from distant sites)
  - Lymphoma (2:1)
  - Melanoma (2:1)
  - Metastatic carcinoma to cervical nodes
  - Squamous cell carcinoma (3:1 to 2:1)
    - Buccal (10:1)
    - Floor (93%)
    - Lip (98%)
    - Tongue (75%)
  - Verrucous carcinoma (3:1)
- Erythema multiforme
- Hemochromatosis
- Keratoacanthoma (2:1)
- Leukoplakia
- Lymphoepithelial cyst (3:1)
- Median rhomboid glossitis
- Mucocele
- Radiation mucositis

Female

- Benign mucous membrane pemphigoid (2:1)
- Desquamative gingivitis
- Geographic tongue (2:1)
- Hemangioma
- Lichen planus (2:1)
- Lipoma (7:1 or equal)
- Palatal tori (2:1)
- Peripheral giant cell granuloma (2:1)
- Peripheral fibroma with calcification
- Plasma cell gingivitis
- Pyogenic granuloma (3:1)
- Ranula

GENDER PREDISPOSITION OF BONY LESIONS

Male

- Cancer
  - Chondrosarcoma
  - Ewing's sarcoma (2:1)
  - Lymphoma (2:1)
  - Melanoma (2:1)
  - Multiple myeloma (2:1)
  - Osteogenic sarcoma
  - Squamous cell carcinoma
    - Central (2:1)
    - Peripheral (3:1 to 2:1)
- Cherubism
- Eosinophilic granuloma (2:1)
- Hand-Schüller-Christian disease (2:1)
- Incisive canal cyst (3:1)
- Lingual mandibular bone cavity
- Osteoblastoma
- Osteoid osteoma (2:1)
- Osteomyelitis (5:1)
- Residual cyst (2:1)
- Traumatic bone cyst

Female

- Cancer
  - Metastatic carcinoma
  - Minor salivary gland tumors
- Central giant cell granuloma (2:1)
- Central hemangioma (2:1)
- Osteoporosis
- Periapical cemental dysplasia
- Primary hyperparathyroidism (7:1)
- Florid cementoosseous dysplasia
- Secondary hyperparathyroidism (2:1)

JAWBONE AND REGIONAL PREDILECTION OF BONY LESIONS

Mandible and Predominant Region

Ameloblastic fibroma (molar, premolar)
Ameloblastoma (80%; posterior, 70%)
Aneurysmal bone cyst (much more common in molar)
Benign nonodontogenic tumors (molar, ramus)
Caffey's disease
Calcifying odontogenic cyst (70%)
Cancer
  Acute leukemia (molar)
  Ewing's sarcoma
  Metastatic carcinoma (95%; molar, premolar)
  Osteogenic sarcoma (body)
  Reticulum cell sarcoma (molar, angle, ramus)
  Squamous cell carcinoma
    Peripheral (3:1, molar)
    Central (2:1)
Cementifying and/or ossifying fibroma (molar, premolar)
Cementoblastoma (first molar, premolar)
Cementoma (90%; incisor)
Central giant cell granuloma (65%; two thirds are anterior to molar)
Central hemangioma (65%; ramus, premolar)
Cherubism (ramus, third molar)
Complex odontoma
Condensing osteitis
Eosinophilic granuloma
Follicular cyst
Garré's osteomyelitis
Odontogenic fibroma
Odontogenic keratocyst (65%)
Odontogenic myxoma (molar, premolar)
Osteomyelitis (7:1; body)
Pindborg tumor (2:1; molar, premolar)
Postextraction sockets
Primordial cyst (third molar)
Proliferative periostitis
Sclerosing cemental masses

Maxilla and Predominant Region

Adenomatoid odontogenic tumor (canine)
Chondrosarcoma (2:1)
Compound odontoma
Fibrous dysplasia (4:3)
Paget's disease (20:3)
Residual cyst (65%)

Rare in Maxilla

Caffey's disease
Cementifying and/or ossifying fibroma
Ewing's sarcoma
Osteomyelitis
Proliferative periostitis
Reticulum cell sarcoma
Traumatic bone cyst

Two or more lesions present

1. Lesions are related

a. Lesion A and lesion B are identical (ex. 2 aphthous ulcers)

b. Lesion B is secondary to lesion A (ex. metastatic tumor and primary)

c. Lesion A and lesion B are both secondary to a third lesion, which may be occult (ex. metastatic tumors and primary)

d. Lesion A and lesion B are manifestation of a systemic disease (ex. infections, Langerhan's cell disease. Disseminated malignancy)

e. Lesion A and lesion B form part of a syndrome (ex. caf'e-au-late spots and multiple neurofibromatosis in von Recklinghausen's disease)

2. Lesions are completely unrelated to each other and occur together only by chance

Developing the working diagnosis

(=operational diagnosis, tentative diagnosis, clinical impression)

- Further exam. the lesion, more definitive questions to expand the history, additional tests —reevaluating all the assembled pertinent data

Formulating the final diagnosis

- Biopsy---microscopic examination

Biopsy

- Artifact: improper fixation, freezing, curling og the specimen
- Specimen should be identified with : patient′s name, clinician′s name, location of the lesion, patient history

Exfoliative cytology

Toludine blue staining

Excisional biopsy

- when lesion <=1cm, does not necessitate a major surgical procedure

Incisional biopsy

- too large to excision, may require multiple tissue samples
- Most suspect area, should be relatively large and deep and include the junction with surrounding normal tissue
- Necrotic tissue, electrosurgery should be avoided as possible

- Punch biopsies: used on surface oral tissue (trismus patient)
- Wedge-shaped biopsies: used for vesiculoerosive disease
- Fine-needle aspiration（fine-needle aspiration FNA, aspiration biopsy）: 21-23 gauge.

Exfoliative cytology

- Fungal or viral disease or malignant-appearing cells
- Not used in smooth-surfaced exophytic lesion, homogeneous leukoplakia, submucosa lesions, unulcerated pigmented lesions, verruca vulgaris, papilloma

Toludine blue staining

- Stained with 1 % Toludine blue, then washed or rinsed with 1% acetic solution
- Toludine blue is an acidophilic metachromatic nuclear dye, selectively stains acidic tissue esp. DNA and RNA (affinity DNA>RNA).
- False positive 8-10%, false negative 6-7%

Summary

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2. HISTORY AND PHYSICAL EXAMINATION
3. CHIEF COMPLAINT
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