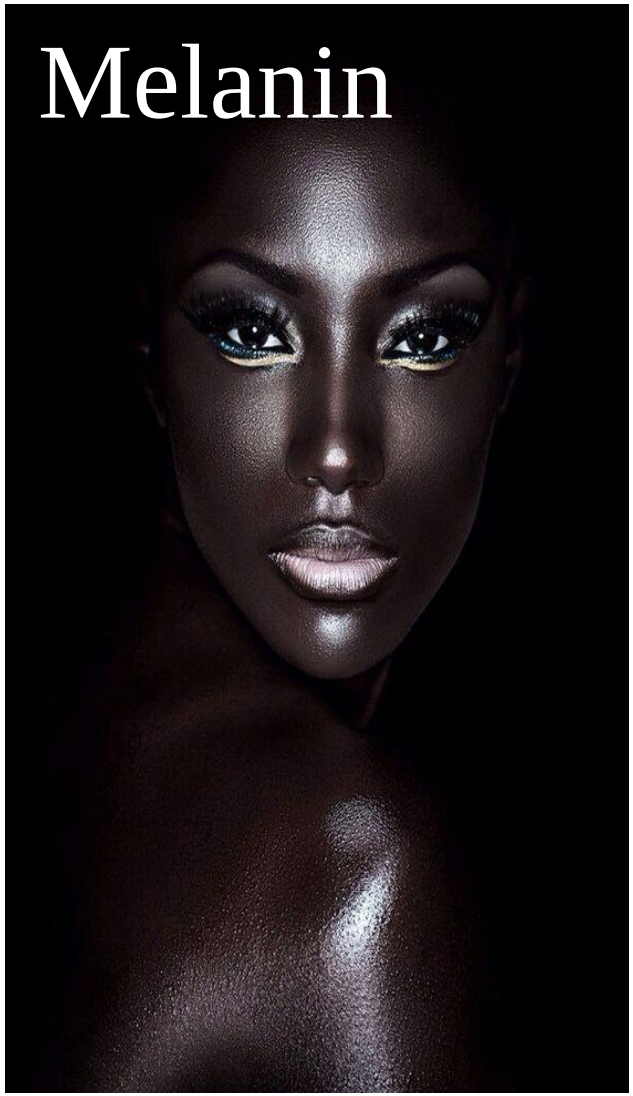
PIGMENTED LESIONS

ORAL MEDICINE & RADIOLOGY
GOVERNMENT DENTAL COLLEGE AND HOSPITAL, AHMEDABAD

Pigment – any organic or inorganic coloring substance

Pigmented lesion- An area of altered coloration of the oral mucosa either because of physiologic or pathologic process because of deposition of endogenous or exogenous pigments

DIFFERENT TYPES OF PIGMENTS



Melanocytes reside in the stratum Basale layer of the epithelium

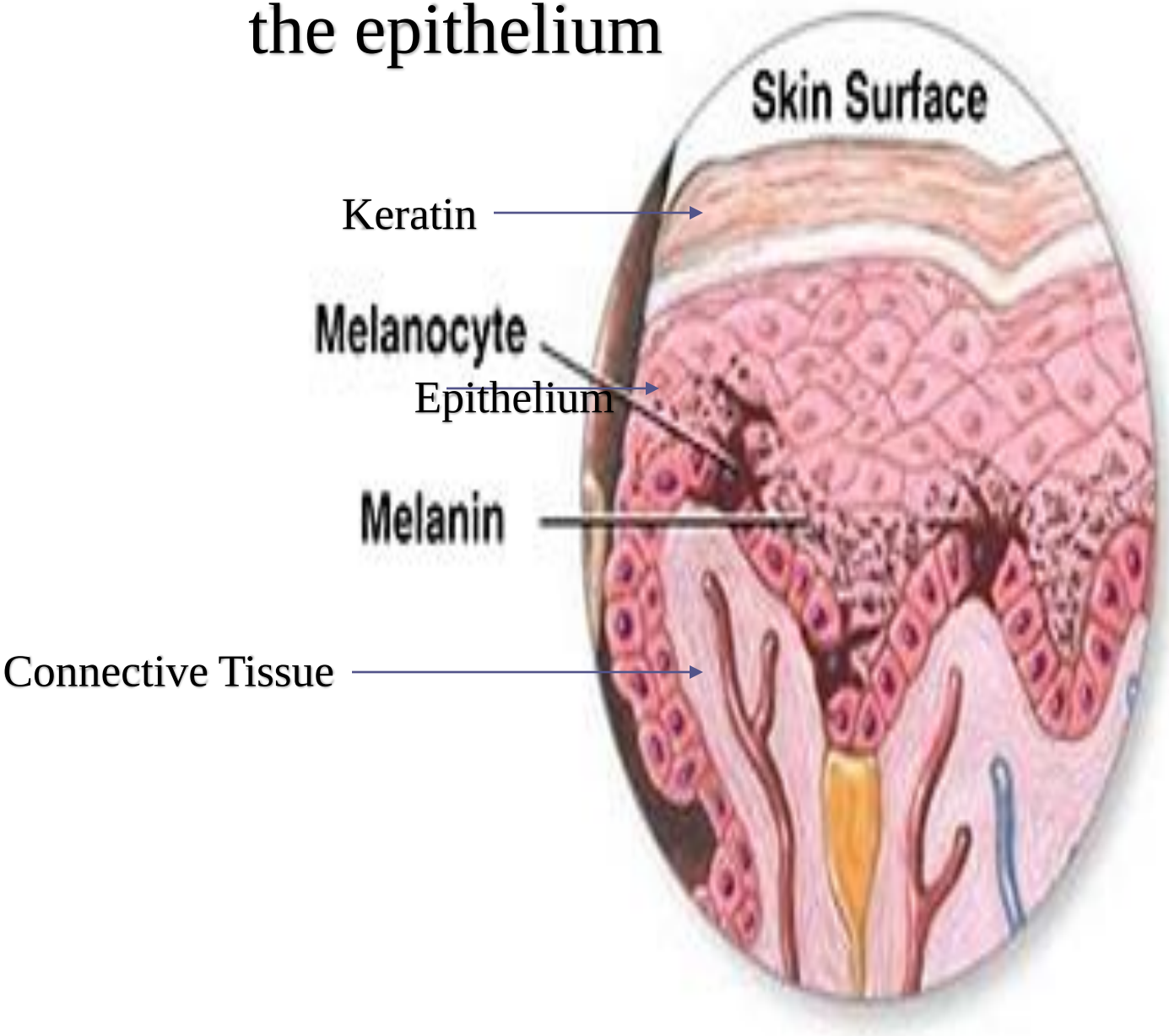
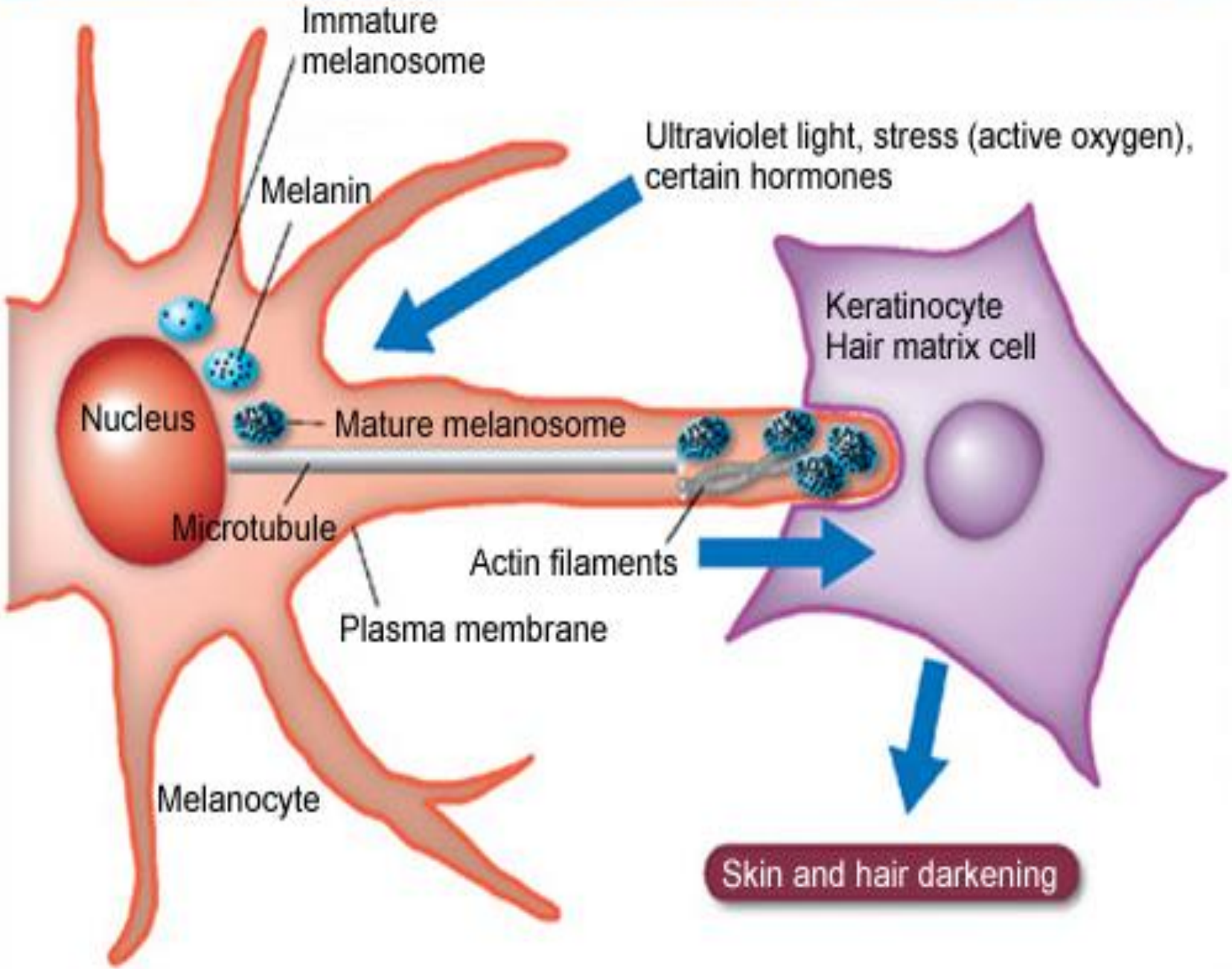


Figure 1: Mechanism behind melanosome transport in melanocytes



CLASSIFICATION

•*ENDOGENOUS PIGMENTATIONS*

1.MELANIN

a)Normal racial variations

b)Addison's disease

c) Peutz- Jeghers syndrome

d) Albright's syndrome

e) Neurofibromatosis

f) Pigmented Nevi

g) Malignant Melanoma

2. BILIRUBIN

a) Jaundice

3. IRON

a) Hemochromatosis

b) Ecchymosis

EXOGENOUS

1) Pigments introduced into the body systemically

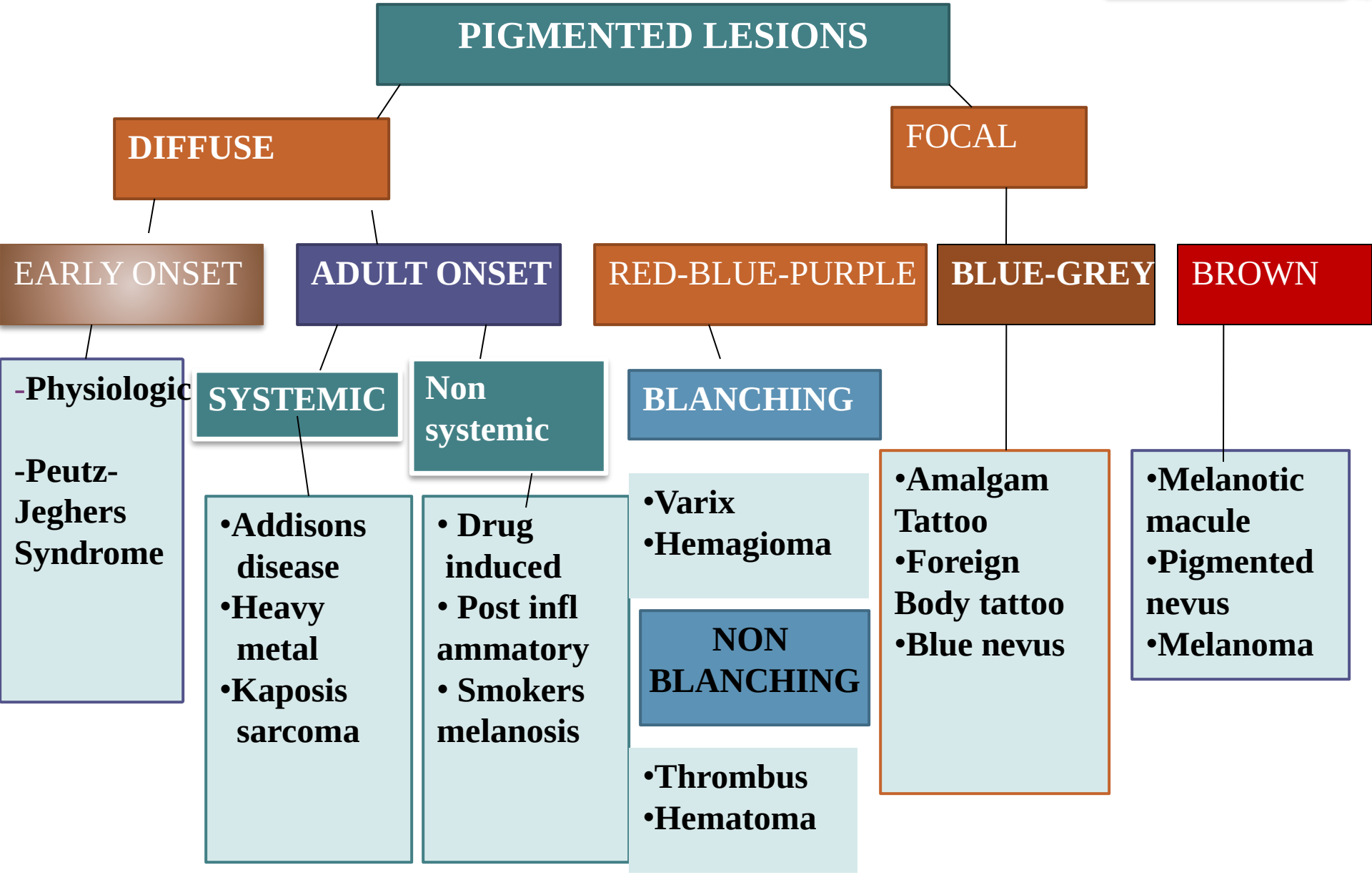
a) bismuth
b) lead
c) silver
d) mercury
e) gold
f) Arsenic
g) Antimalarials

2) Pigments introduced into the oral mucosa locally

a) Amalgam tattoo
b) Industrial accidents involving various Materials such as lead or copper
c) Graphite (pencil tips)

Miscellaneous

a) black hairy tongue
b) Stains from tobacco, lozenges etc.


PIGMENTED LESIONS
DIFFUSE
FOCAL
EARLY ONSET
ADULT ONSET
RED-BLUE-PURPLE
BLUE-GREY
BROWN
-Physiologic
-Peutz-Jeghers Syndrome
SYSTEMIC
Non systemic
BLANCHING
•Addisons disease
•Heavy metal
•Kaposis sarcoma
• Drug induced
• Post infl ammatory
• Smokers melanosis
•Varix
•Hemagioma
NON BLANCHING
•Thrombus
•Hematoma
•Amalgam Tattoo
•Foreign Body tattoo
•Blue nevus
•Melanotic macule
•Pigmented nevus
•Melanoma

Endogenous Pigmentation

a)Normal racial variations
b)Addison's disease
c) Peutz- Jeghers syndrome
d) Albright's syndrome
e) Neurofibromatosis
f) Pigmented Nevi
g) Malignant Melanoma
h)Post inflammatory
i)Hiv

Jaundice
Carotenemia

SUBMUCOSAL HAEMORRHAGES
HAEMANGIOMA
VASCULAR MALFORMATIONS
VARIX AND THROMBUS

1)PHYSIOLOGIC (RACIAL) PIGMENTATION

- Greater melanocytic activity
- The colour ranges from **light to dark brown.**
- The **attached gingiva** is the most common intraoral site of such pigmentation
- Pigmentation of the **buccal mucosa, hard palate, lips and tongue**

Figure 2: Physiologic (racial) pigmentation in an African boy presenting as a well-demarcated dark brown band on the attached gingiva. The marginal gingiva is unaffected.

Physiological pigmentation increases with age, and color intensity can be influenced by smoking, hormones and systemic medications

For aesthetic- gingiabrasion

Differential diagnosis

- Smokers melanosis
- Resolving ecchymosis
- Amalgam tattoo
- Addison disease
- Peutz jegher syndrome
- Drug administration

2)PEUTZ JEGHERS SYNDROME

- Rare genetic disorder associated with mutation of the LKB1 gene ***on chromosome* 19**
- Periorofacial areas
- Resemble freckles

•Melanin spots develop on **buccal mucosa and lips** may involve gingiva,hard palate and tongue

•In addition, the **face and digits** may involve

•The pigmentation is **1 to 4 mm** round, oval or irregular **brown to blue gray macules** or occasionally almost black discoloration

Gastric polyps

Mucocutaneous symptoms

Characterized by

1. **Pigmented mucocutaneous macules,**
2. **Intestinal polyps**
3. Increased risk of cancer in many organs, including the small intestine, colon, stomach, pancreas, breast and genital tract

Surgical intervention is necessary to prevent ischemic necrosis of the bowel

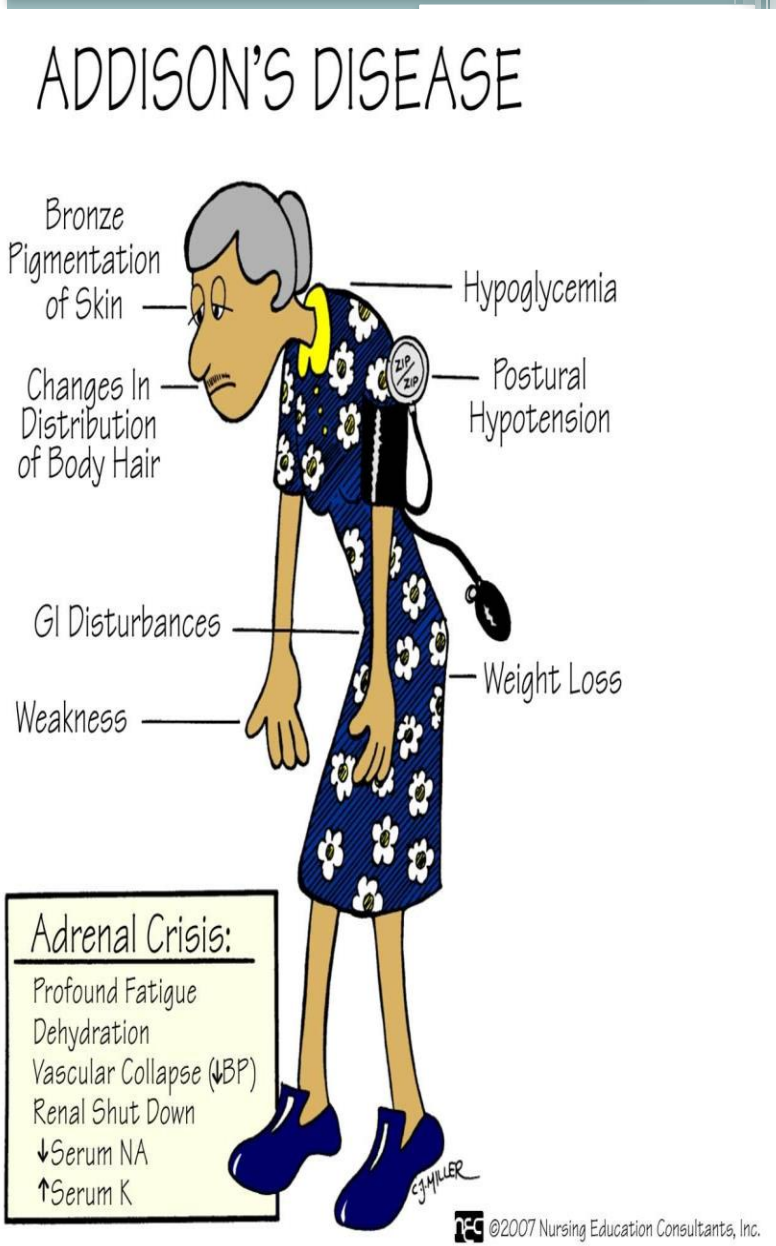
3)ADDISON'S DISEASE OR PRIMARY HYPOADRENALISM

- Progressive **bilateral destruction of the adrenal cortex** by autoimmune disease, infection or malignancy

- The increased production of ACTH **induces melanocyte-stimulating hormone**, which results in diffuse pigmentation of the skin and oral mucosa

Oral mucosal changes are the **first manifestation** of the disease with the skin hyperpigmentation occurring afterward.

Oral involvement presents as **Diffuse brown** patches on the gingiva, buccal mucosa, palate and tongue



DIAGNOSIS

- Plasma ACTH levels
- Serum Cortisol <20 ug/dl

Addison's disease can be fatal if left untreated

Therapy: daily dose of 25 to 37.25mg (1 to 1 and half tablets) of cortisone by mouth.

In **Emergency** 200mg cortisone intramuscularly

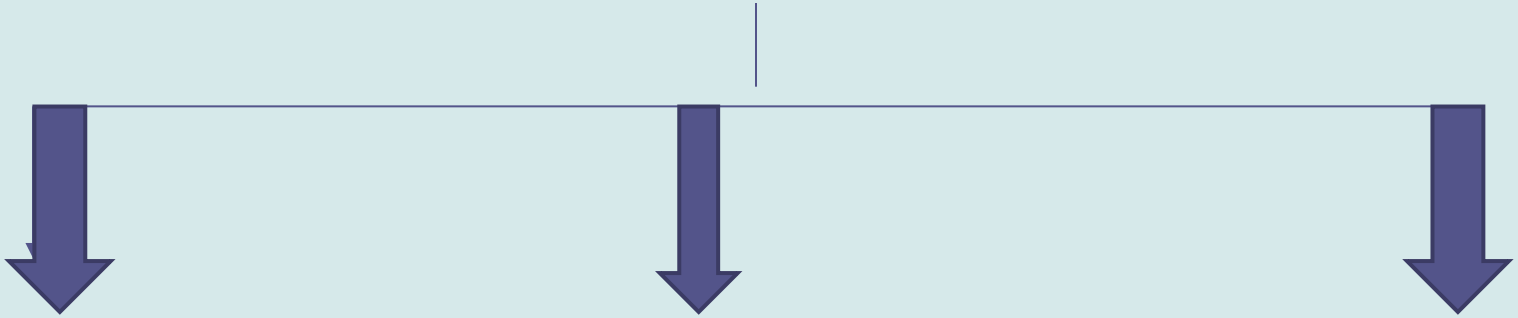
4)McCUNE -ALBRIGHT SYNDROME (Polyostotic fibrous dysplasia)

Mutation of GNAS-1 gene

encodes G Protein

production of cAMP

Overproduction of Camp



Hyperfunction of Endocrine gland → Precoicus puberty

proliferation of melanocytes → café-au-lait spots

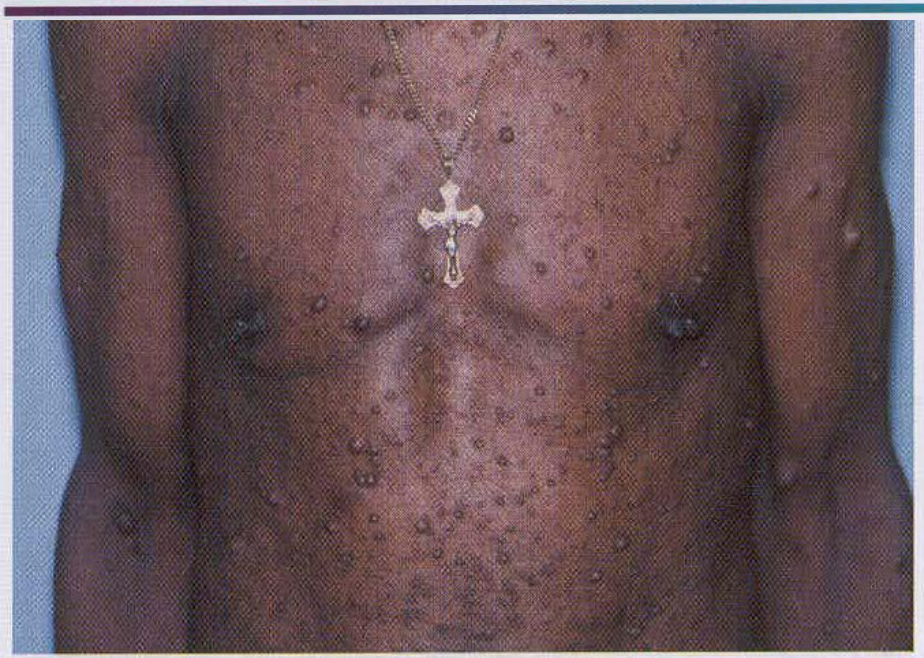
differentiation of osteoblasts → fibrous dysplasia

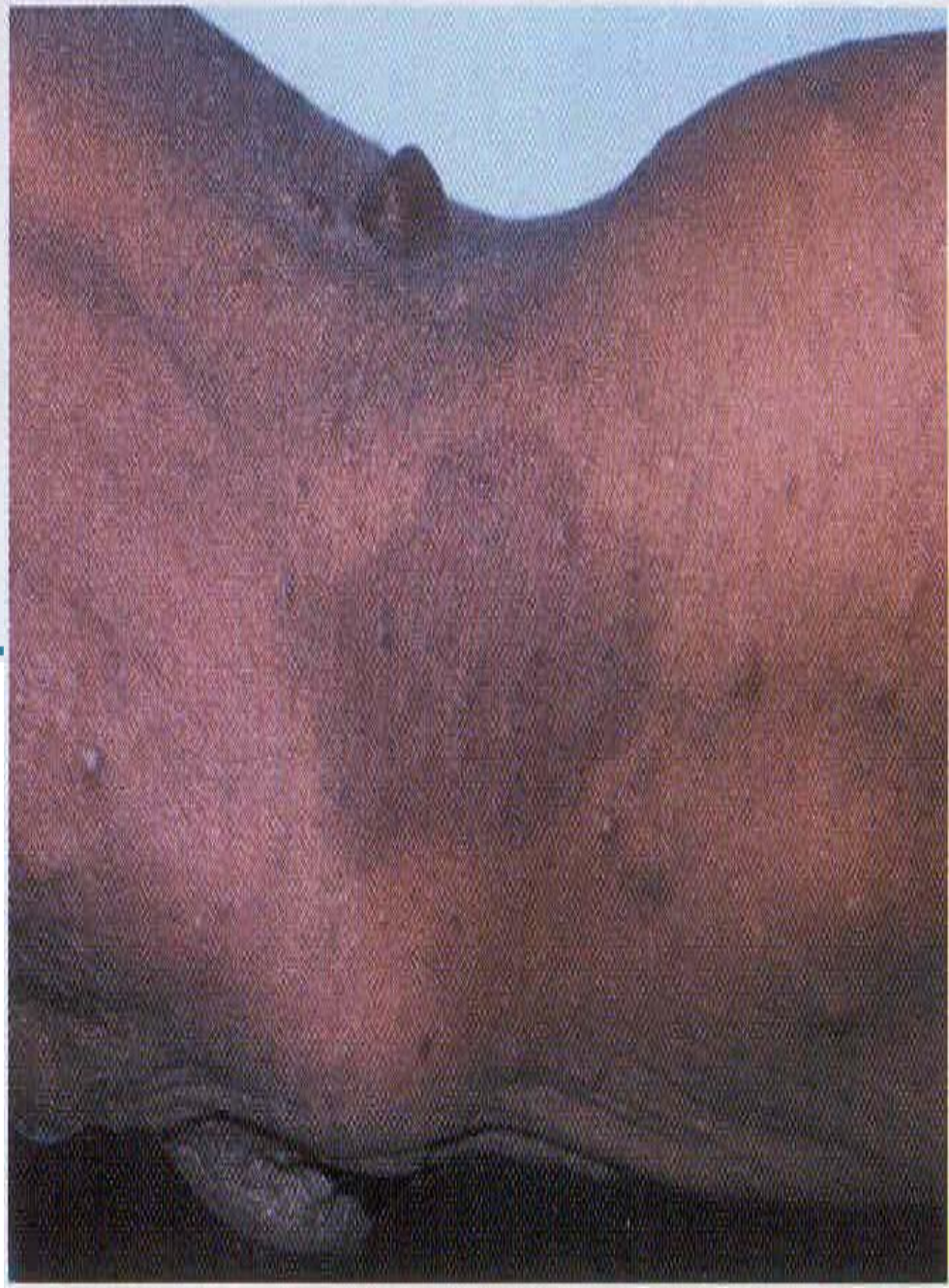
CAFÉ AU LAIT spots

- Usually seen on **trunks & thighs**
- Congenital
- **Very irregular** resembles **Coast line of Maine**
- Pigmented Melanotic macules varies from small macule to broad Diffuse lesions
- Light **brown** in color and
- Occur rarely in Oral cavity

5)Neurofibromatosis

- Hereditary condition
- Mutation of NF1 gene located on chromososme 17q11
- yellowish tan to **dark brown** macules
- Sessile or pedunculeted tumors of the skin and mucous membrane
- **cafe au lait** (coffee with milk) pigmentation on the skin.
- These spots are 1 to 2 cm to several centimeters **smooth** edged resemble COAST LINE OF CALIFORNIA.
- **Crowe's sign** accompanied by 6 or more macules is pathognomonic for NF 1.
- **LISCH NODULES**





6)MALIGNANT MELANOMA

- It is a malignant neoplasm of melanocyte can occur on skin or mucosal surfaces

ETIOLOGY:

- Sun exposure
- Artificial UV sources
- Fair skin
- Familial melanoma- abnormalities on chromosome 9p21

Clinical Classification of Oral Malignant Melanoma

Table 1: Clinical Classification of Oral Malignant Melanoma (omm)

Clinical type	Pigmentation	Clinical appearances	Clinical differential diagnosis
1. Macular	Pigmented	Asymptomatic, flat brown dark blue or black macule	Smoking-associated melanosis Naevi Postinflammatory or medication-induced melanosis, amalgam tattoo Pigmentation associated with Hormonal disturbance Melanoacanthoma
2. Nodular	Pigmented	Elevated, exophytic growth mostly pedunculated with regular outline and smooth surface color: black, gray, or purple	Hemangioma or any vascular malformation
	Nonpigmented (amelanotic)	Elevated, exophytic growth mostly pedunculated or swelling with regular outline, smooth surface, normal pink to red in color	Benign gingival over growth Pyogenic granuloma
3. Ulcerated	Pigmented	Asymmetrical, elevated, exophytic growth with irregular outline, rough surface, Color: brown, black, and greyish purple with erythematous surface	Kaposis sarcoma
	Nonpigmented (amelanotic)	Asymmetrical, elevated, exophytic growth with irregular outline, rough surface, Color: normal to reddish color	Adenocarcinoma Oral squamous cell carcinoma Sarcomatous growth Bony malignancy (chondrosarcoma and osteosarcoma)

•**Metastasis** -lymph node, lungs, liver, brain and bones.

Radiographic features

underlying or adjacent bone show evidence of **irregular or moth-eaten destruction**

DIAGNOSIS

Immunohistochemistry- positive for S100 protein

•**TREATMENT**

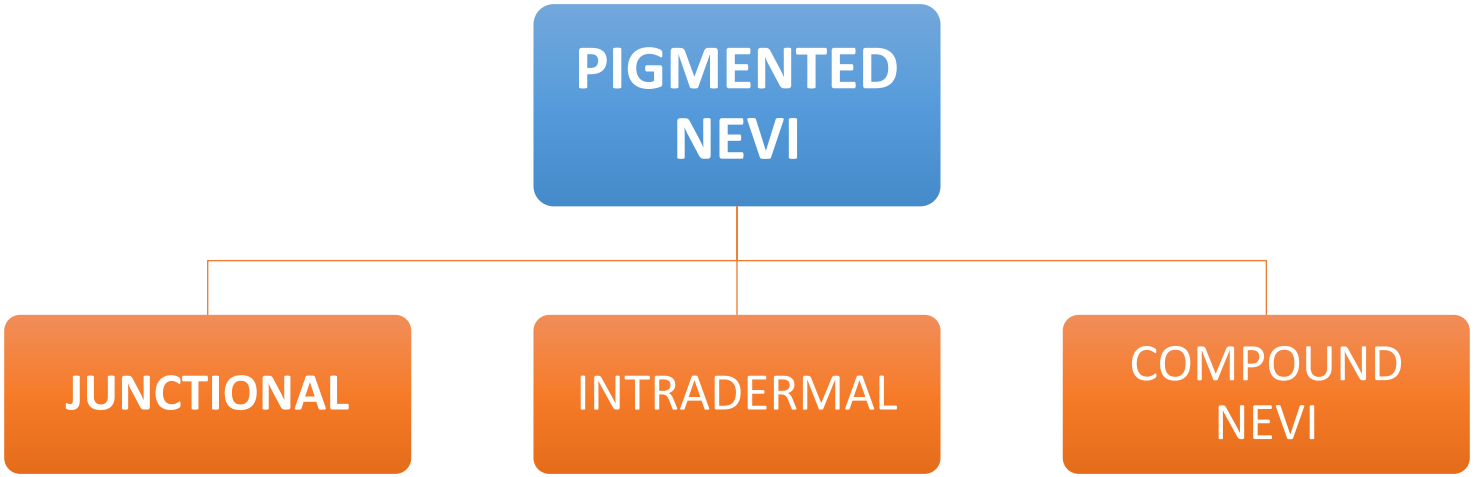
•Lesion should be surgically excised with 2 to 5 cm margins and neck dissection followed by radiotherapy and /or chemotherapy.

Differential diagnosis

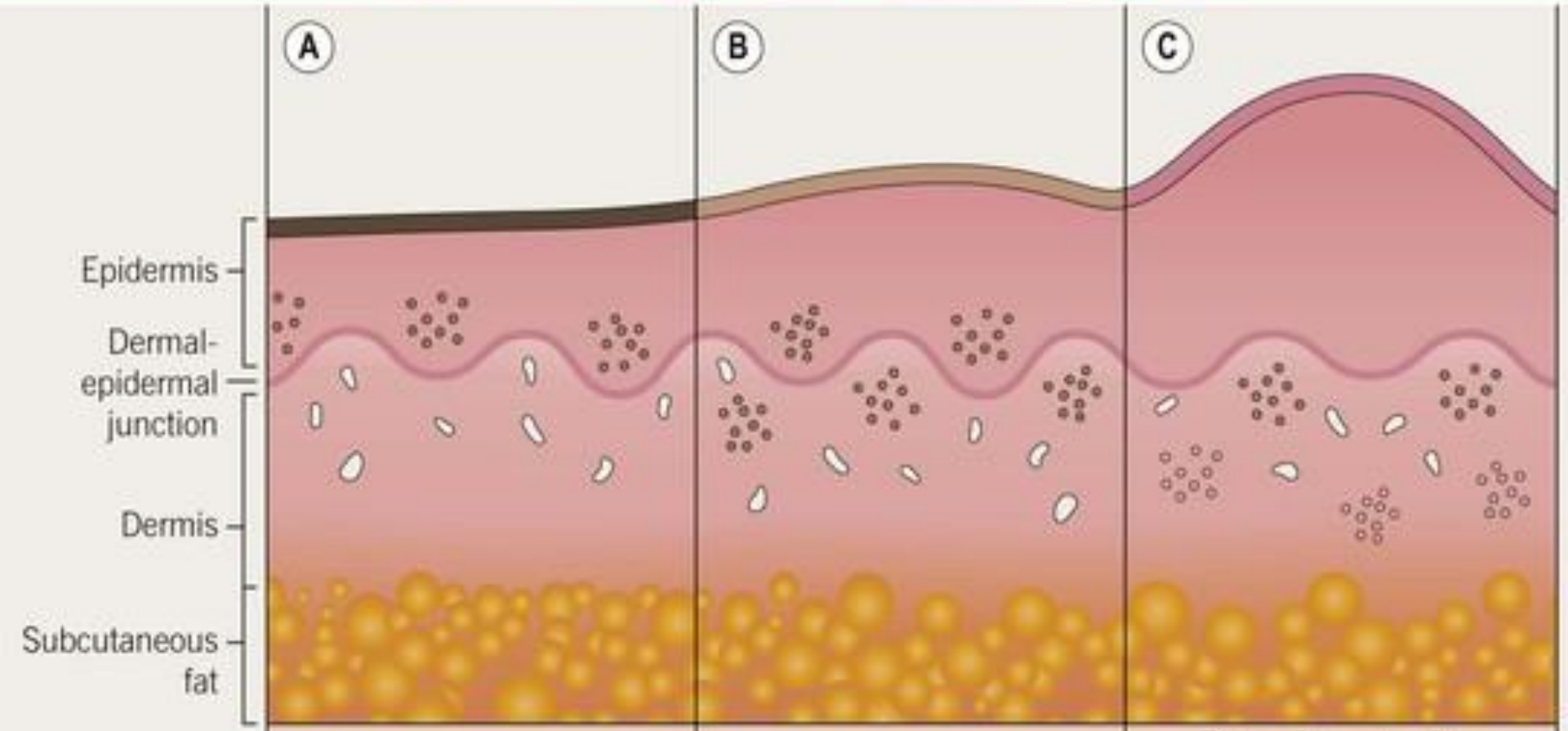
- Nevus
- Amalgam tattoo
- Focal hemosiderin deposit
- Racial pigmentation

7)PIGMENTED NEVI

- PRESENT AS EITHER BROWN OR BLUE LESIONS
- **ETIOLOGY**
  - Pigmented **nevi** are **collection of nevus cells** that are round or polygonal
  - Adaptive response associated with formation of nests of cells
  - They may be found in epithelium or supportive connective tissue or both



THREE COMMON TYPES OF ACQUIRED MELANOCYTIC NEVI



	A	B	C
Typical color	Dark brown to black	Brown	Skin-colored, pink, or light brown
Topography	Macule	Slightly elevated, often dome-shaped papule	Elevated, soft, often dome-shaped papule
Type of melanocytic nevus	Junctional	Compound	Intradermal

BLUE NEVUS

It appears as a macular or dome shaped, blue or blue-black lesion smaller than 1 cm in diameter

JUNCTIONAL NEVUS

It appears as a macule in which there is deposition of the melanin in the epidermis

8)POSTINFLAMMATORY PIGMENTATION

- Long-standing inflammatory mucosal diseases, such **as oral lichen planus, pemphigus or pemphigoid** can cause mucosal pigmentation
- The pathogenesis of post inflammatory pigmentation remains unclear
- Clinically, **multiple brown–black pigmented areas** are noted adjacent to reticular, erosive or vesicular lesions.
- Generally, the resolution of the inflammatory process allows the cessation of oral pigmentation.

Reticular lichen planus with pigmentation

HABIT INDUCED SMOKER'S MELANOSIS

Increased production of melanin, provide a biologic defence against the noxious agents present in tobacco smoke

- Smoker's melanosis occurs in up to 21.5% of smokers.
- The **intensity o**f the pigmentation is related to the **duration and amount** of smoking
- The brown–black lesions most often involve the **anterior labial gingiva**
- palate and buccal mucosa pigmentation associated with pipe smoking

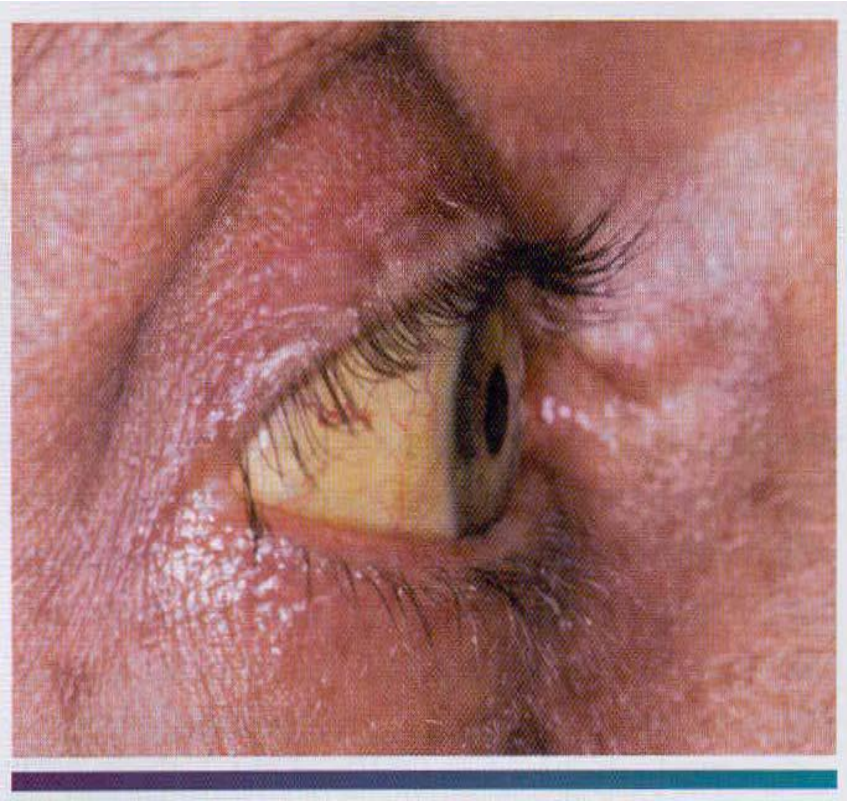
Figure 4: Heavy pigmentation of the attached gingiva in the region of the right lower canine in a smoker. The cigarette was usually held on the right side.

9)Pigmentation associated with HIV

- Hyperpigmentation of skin,oral mucosa, fingernails & toenails
- **Deficiency of**
  - primary adrenocortical deficiency
  - antiretroviral therapy
- Irregular macules with brown or dark brown colour

SITE: Tongue
Buccal mucosa
Palate

BILIRUBIN PIGMENTATION (JAUNDICE)



- Jaundice is a condition characterized by **excess bilirubin** in the blood stream.
- The bilirubin **accumulates** in the tissues which results in **a diffuse, uniform yellowish discoloration** of the skin and mucosa
- Because **elastin fibers** have an **affinity for bilirubin**, tissues that have a high content of elastin,including the **sclera**, lingual frenum, and soft palate are prominently affected.
- Best detected by examination of the scleras in the natural light
- **Buccal mucosa and soft palate** afford the best areas to observe the evidence of jaundice

CAROTENEMIA

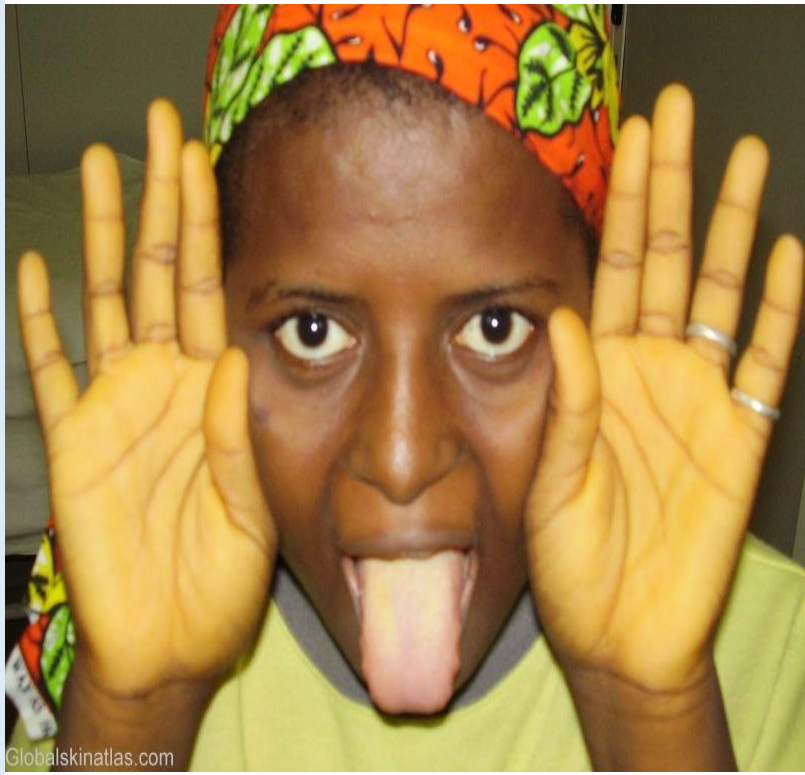
- Chronic excessive levels of carotid pigments
- **Orange to yellowish** pigmentation of skin & oral mucosa
- Most intense **on palms & soles & in the area of soft palate**

DIAGNOSIS

Serum bilirubin

Serum carotene

No treatment dietary modification



SUBMUCOSAL HEMORRHAGE

Traumatic event result in

hemorrhage and entrapment of blood within tissues

Bright red macule

Different terms are used, depending on the size of the hemorrhage

•Minute(pinpoint) hemorrhages into skin or mucosa are termed **PETECHIAE**.

• If a slightly larger area is affected, the hemorrhage

is termed a **PURPURA**.

• Any accumulation over 2cm is term as **ECCHYMOSIS**.

• If the accumulation of blood within tissue produces

a mass, this is termed a **HEMATOMA**.

•**Blunt trauma to the oral mucosa** often results in hematoma formation.

•Can arise from repeated or prolonged increased intrathoracic pressure associated with such activities as

•repeated coughing,

•vomiting,

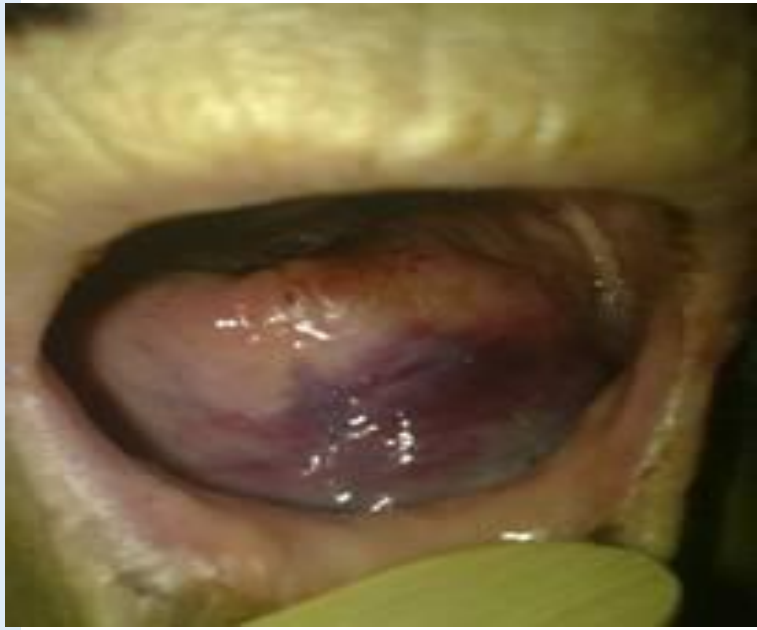
•convulsions

Nontraumatic causes such as

•Thrombocytopenia

•disseminated intravascular coagulation(DIC),

•Viral infections infectious mononucleosis and measles.



Focal Pigmentation

Hemangioma

- Hemangioma is a benign proliferation of the endothelial cells that line vascular channels.
- Hemangioma regresses as the patient ages

Vascular malformation

- Vascular malformation is a structural anomaly of blood vessels without endothelial proliferation
- Vascular malformation persists throughout life

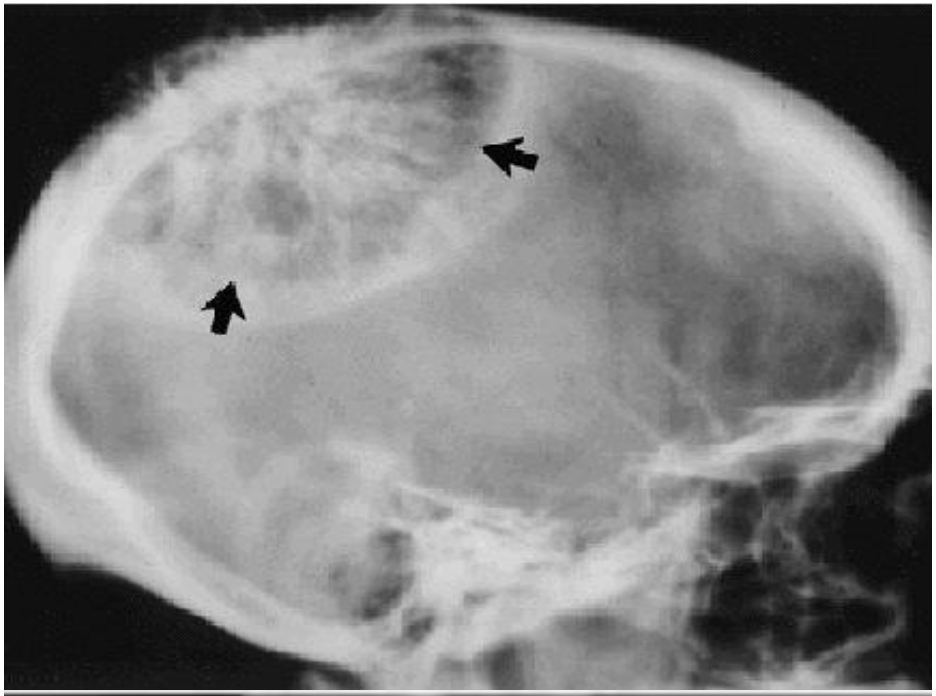
	Hemangioma	Vascular malformation
Description	Ab endothelial cell proliferation	AbnormalStructural development
Elements	Inc no of capillaries	Mix of artery, vein, capillaries (AV shunt)
Growth	Rapid congenital, ceases puberty	Grows throughout
Boundaries	Circumscribed	Poorly circumscribed
Thrill & bruit	absent	present
Involution	Spontaneous	Does not involute
Resection	Easy	Difficult, surgical haemorrhage
Recurrence	Uncommon	Common

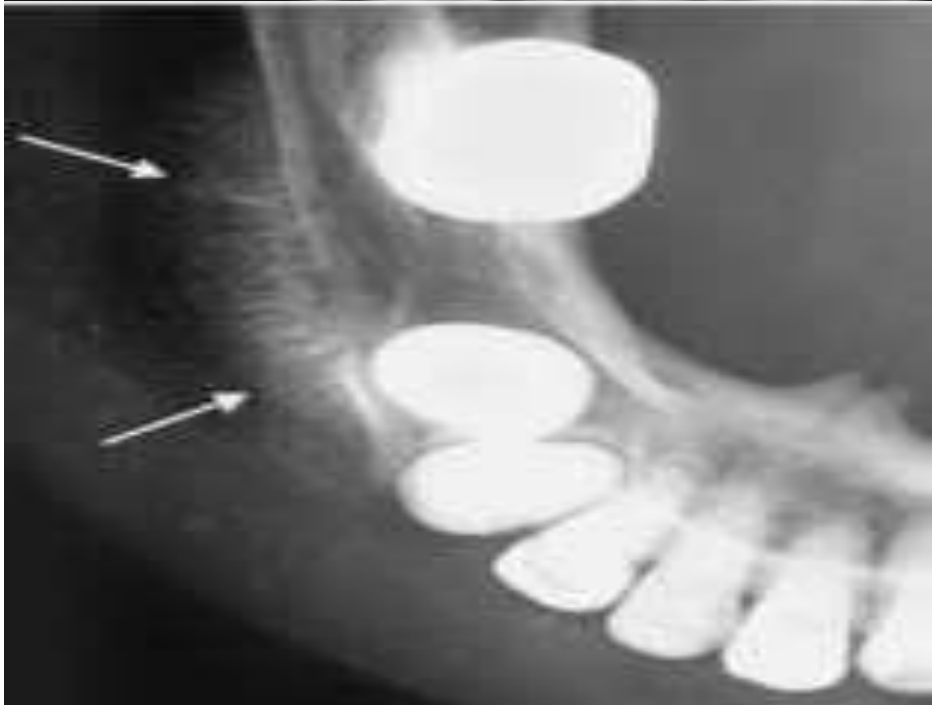
Classification of Hemangioma

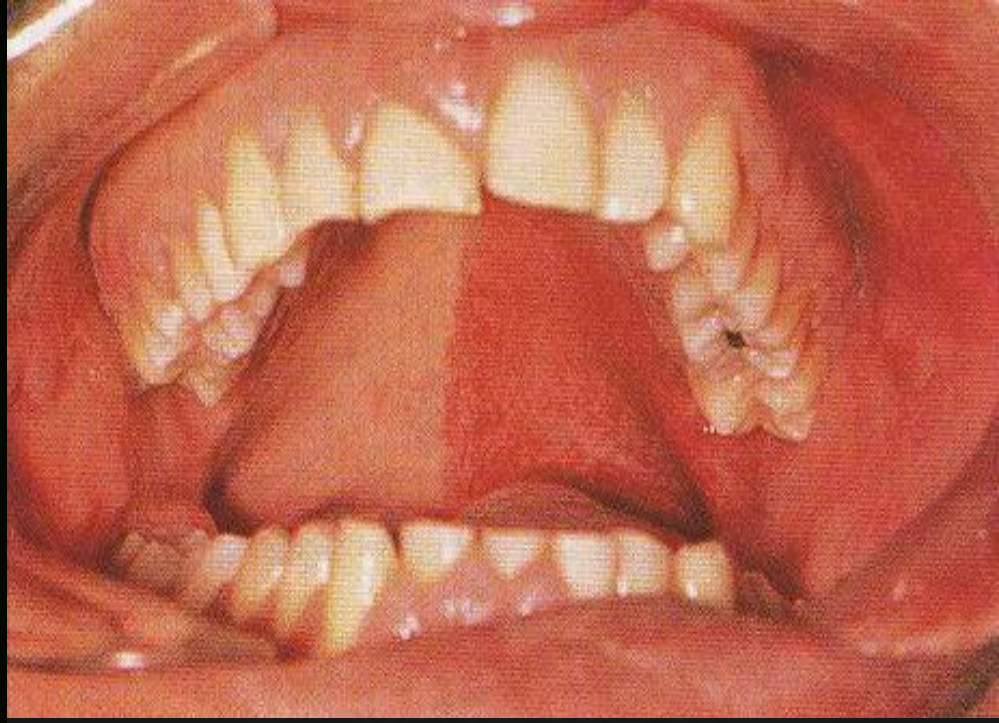
Classification

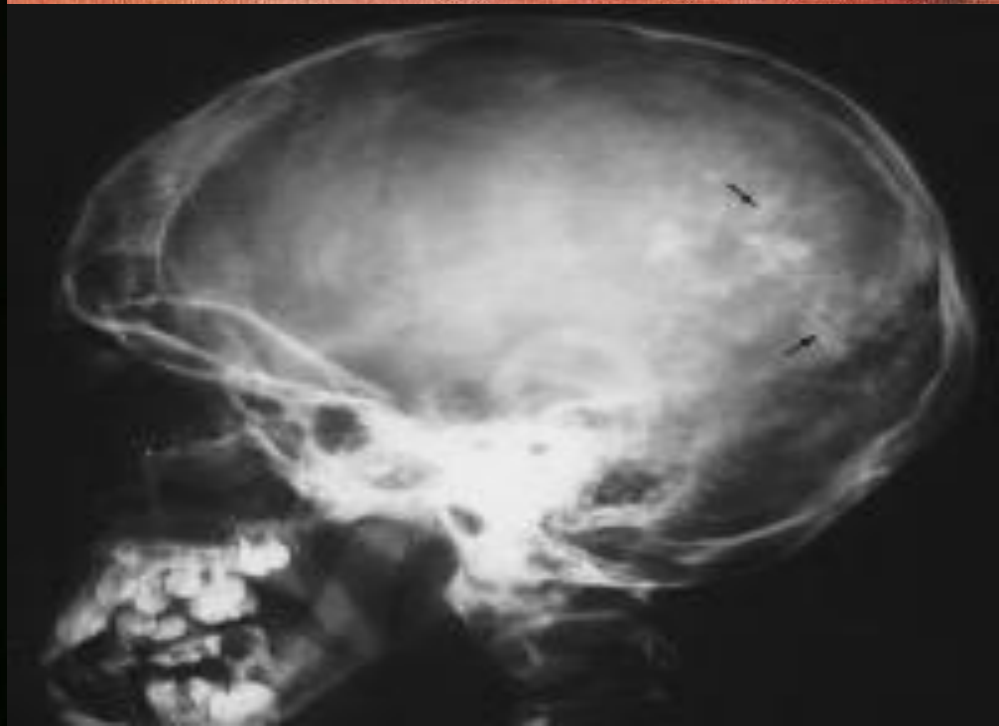
A) Classification specific to orofacial region (According to their depth, number, distribution and location)
   i) *Superficial haemangiomas/Mucosal haemangioma involve only the mucosa/skin*
      - Capillary haemangioma
      - Cavernous haemangioma
   ii) *Compound haemangiomas* – Involve both the mucosa/skin and subcutaneous tissue
   iii) *Deep haemangiomas* – Involve the subcutaneous surface and not the overlying mucosa/skin.
      - Central haemangioma
      - Intramuscular haemangioma
      - Haemangioma within salivary glands

B) Another classification based on their clinical behaviour and histology:
   i) *Infantile haemangioma*
      - It is more common
      - Develops shortly after birth
   ii) *Congenital haemangioma*
      - It is rare
      - It present at birth









VARIX AND THROMBUS

- Varices are abnormally **dilated veins**
- patients **older than 60 years** of age
- **Asymptomatic**
- The most common intraoral location is **the ventral surface of the tongue**
- If the varix contains a thrombus, it presents as a firm nontender , bluish purple nodule.

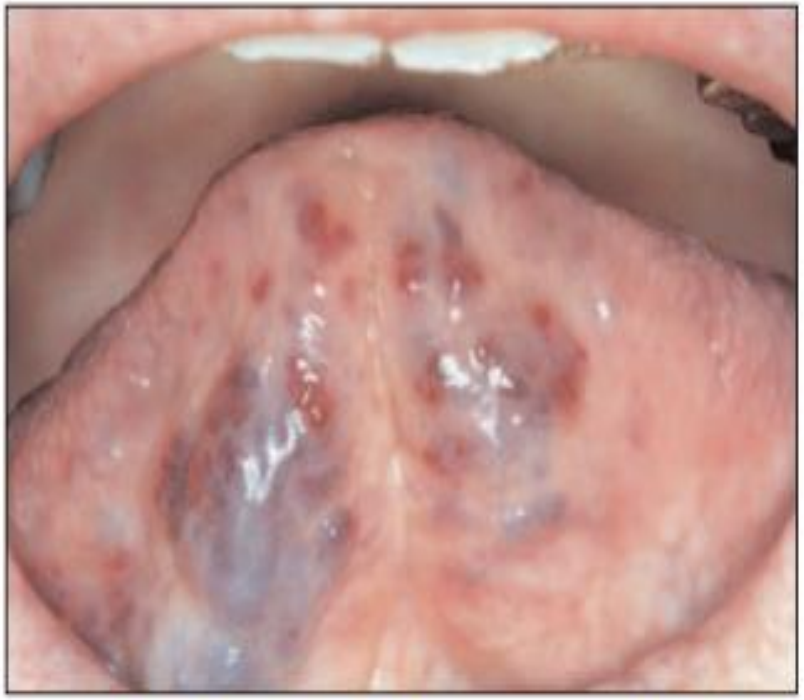


Figure 6: *A typical example of sublingual varices in an elderly patient. The dilated vessels were soft to palpation and blanched on pressure.*

EXOGENOUS PIGMENTATION

Exogenous Pigmentation of Oral Mucosa

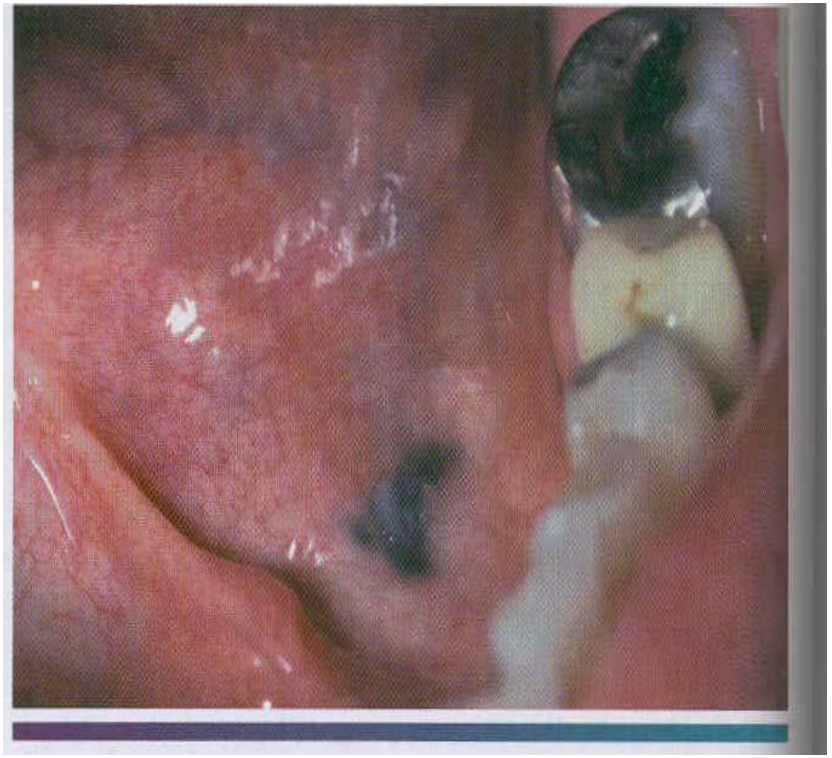
Source	Color	Disease Process
Silver amalgam	Gray, black	Tattoo,iatrogenic trauma
Graphite	Gray, black	Tattoo, trauma
Lead, mercury, bismuth	Gray	Ingestion of paint or medicines
Chromogenic bacteria	Black, brown, green	Superficial colonization

AMALGAM TATTOO

•An **iatrogenic lesion** that follows soft tissue **implantation of amalgam particles** or passive transfer by chronic friction of mucosa against amalgam restoration

ETIOLOGY

- This usually follows tooth extraction
- Preparation of teeth having old amalgam filling for gold casting restoration
- Polishing of old restoration (producing an aerosol of amalgam that becomes impregnated in the tissues)



CLINICAL FEATURES

- Commonly affected sites **gingiva,buccal mucosa,palate,floor of mouth and tongue**

- Because amalgam is relatively well tolerated by soft tissue, clinical signs of inflammation rarely seen

- Amalgam tattoos are **painless, gray-blue macules** that range in size from a few millimeters to greater than 1 cm and do not change with time

AMALGAM TATTOO.

PLUMBISM

- **Exposure occurs**
  - **Lead processing industries**
  - **handling of lead oxide batteries,**
  - **from the welding of lead covered surfaces**
  - **some food and drink containers**
  - **exhaust of automobile**

- **ORAL MANIFESTATION:**
- Ulcerative stomatitis and a gingival lead line.
- The lead line (BURTONIAN LINE) appears as **a gray or bluish-black line** along the **marginal gingiva** similar to BISMUTH LINE but more DIFFUSE than bismuth
- Gray areas also may be noted on the buccal mucosa and tongue.
- Metallic taste,
- Excessive salivation

- **Treatment** Chelating agent such as EDTA or penicillamine.

MERCURY POISONING

- Potential occupational hazards for DENTISTS and DENTAL TEAM
- Arising from IMPROPER use of amalgam alloy

MECHANISM OF ACTION

- Methyl mercury penetrate the erythrocyte membrane and bind to hemoglobin

SYSTEMIC FINDINDS

- Diarrhoea, headache,insomnia,depression,
- Renal symptoms,Tremors

ORAL MANIFESTATIONS

- Increase saliva,
- Gingiva becomes extremely sensitive and painful
- Itching sensation,
- Metallic taste,
- Salivary glands & lymph nodes are swollen.
- Tongue is enlarged ,painful,ulcerated
- Burning sensation,
- Diffuse greyish pigmentation in the form of a line/band along the alveolar mucosa
- Teeth may exfoliate due to marked periostitis.

- **PINK DISEASE**
- Chronic mercury exposure in children is term ACRODYNIA
- **CLINICAL FEATURES**
- The skin of hands,feet,nose,ear and cheeks become RED or PINK and has a cold feeling
- The skin over the affected areas peels frequently
- Severe sweating
- Others features

1.Extreme irritability

2.Tachycardia

3.Hypertension

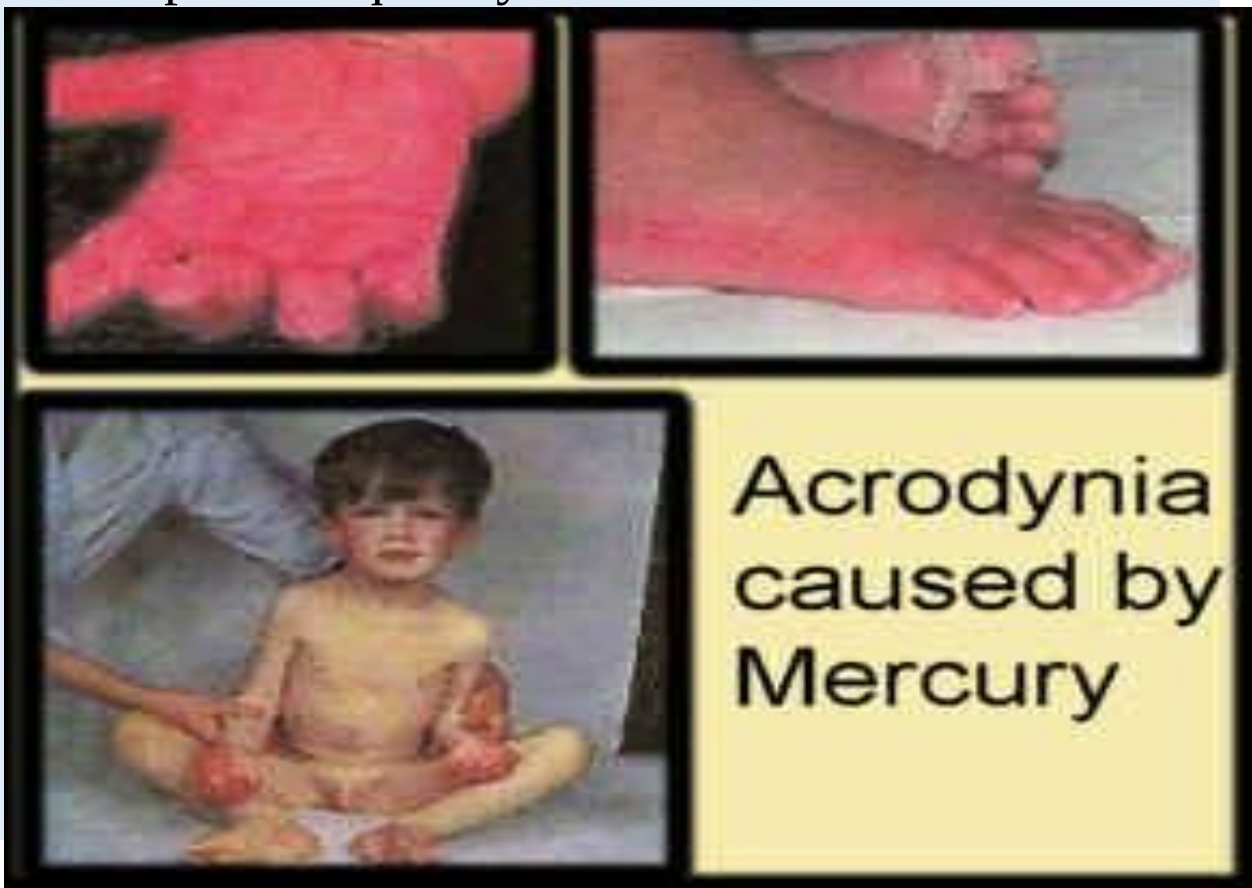
4.Insomnia

5.Gastrointestinal upset

6.Stomatits

7.Muscular weakness

8.Patchy loss of hair



TREATMENT

- Removal of source of mercury
- Bed rest, Diet control
- Oral – Atropine to lessen the salivary flow

- Immediate chelation therapy. the administration of dimercaprol, D-pencillamine, or 2,3-dimercapto-1-propane sulphonic acid

ARGYRIA(ARGYROSIS)

- Exposure to **silver compound**
- Cause: local &systemic absorption of silver compound
- Permanent pigmentation of the skin and mucous membrane.
- One of the first signs of argyria occurs in the oral cavity and appears as a BLUE SILVER LINE along the gingival margins

- **Blue silver line is due to the deposition of metallic silver and silver sulfide pigments**
- **These deposits result in a diffuse grayish- black discoloration that develops primarily in the sun-exposed areas.**
- **The sclerae and nails also may be pigmented.**

- **Management:**
- **Source of contact be eliminated.**
- **No antidote for silver intoxication**

BISMUTH POISONING

- **Medicinal use of bismuth in treatment of syphilis and certain dermatologic disorders**
- **A thin blue black bismuth line along gingival margin which is sometimes confined to the gingival papilla**
- **Bismuth line is due to granules of bismuth sulphide produced by action of hydrogen sulfide on the bismuth compound in the tissue**
- **Metallic taste with burning sensation**
- **Tongue is frequently sore and enlarge**
- **No specific treatment for bismuth line**
- **Can be bleached by concentrated hydrogen peroxide**
- **Maintain oral hygiene**

ARSENIC POISONING

Industrial exposure, accidental or intentional poisoning

- The discoloration due to both the presence of the metal and increase melanin production
- palmer hyperkeratosis
- Oral manifestation: Diffuse macular hyperpigmentation
- Excessive salivation
- painful area of necrotizing ulcerative stomatitis

Chronic gastritis and collitis are frequently the only symptom

Drug-Induced Pigmentation

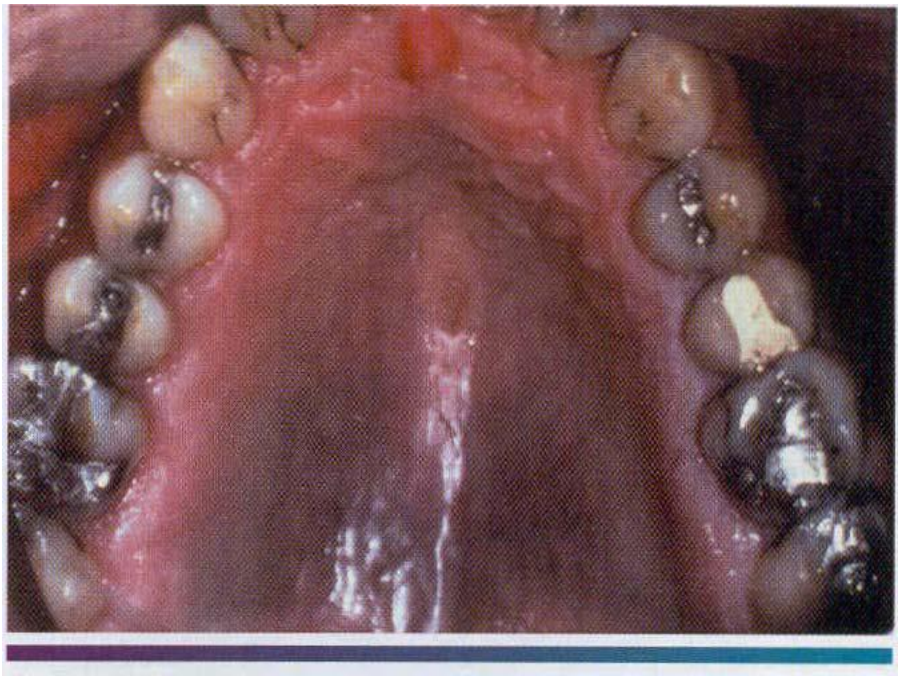
The pathogenesis of drug-induced pigmentation varies, depending on the causative drug

- It can involve accumulation of melanin, deposits of the drug or one of its metabolites
- Mucosal discolouration associated can be described as blue–grey or blue–black
- In most cases only the hard palate is involved
- Laboratory studies have shown that these drugs may produce a direct stimulatory effect on the melanocytes.

- Cotrimazole was the most common drug associated to oral pigmentation followed by tetracycline

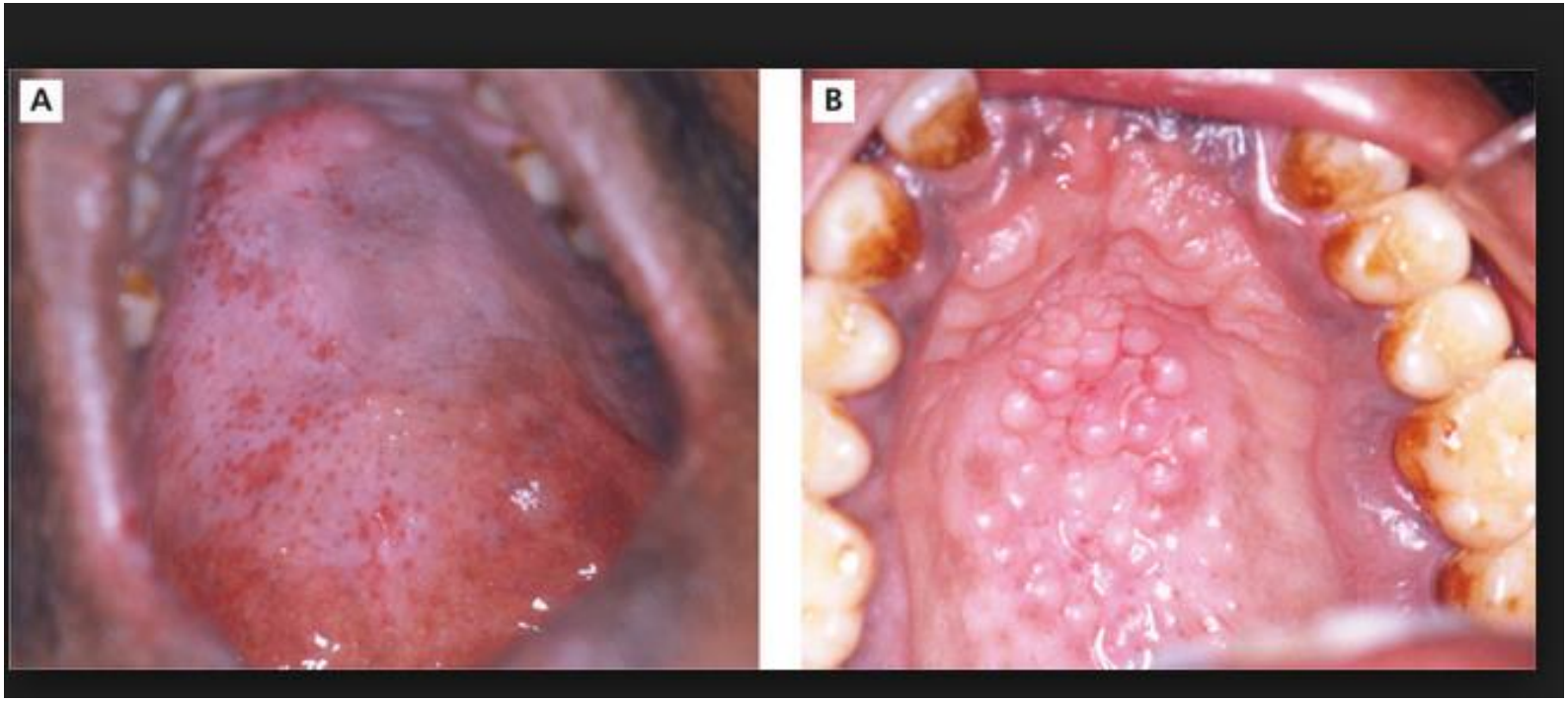
Drugs Associated With Oral Pigmentation

Antimalarials: quinacrine, chloroquine, hydroxychloroquine
Quinidine
Zidovudine (AZT)
Tetracycline
Minocycline
Chlorpromazine
Oral contraceptives
Clofazimine
Ketoconazole
Amiodarone
Busulfan
Doxorubicin
Bleomycin
Cyclophosphamide
5-Fluorouracil



Chlorpromazine pigmentation. Diffuse grayish pigmentation of the hard palate.

Unlike heavy-metal pigmentation, which affects the free gingival margin, smoker's melanosis develops on the attached gingiva



Diffuse grayish white pigmentation of palate with red pin point areas- smokers palate

TREATMENT

with cessation of smoking

BLACK HAIRY TONGUE

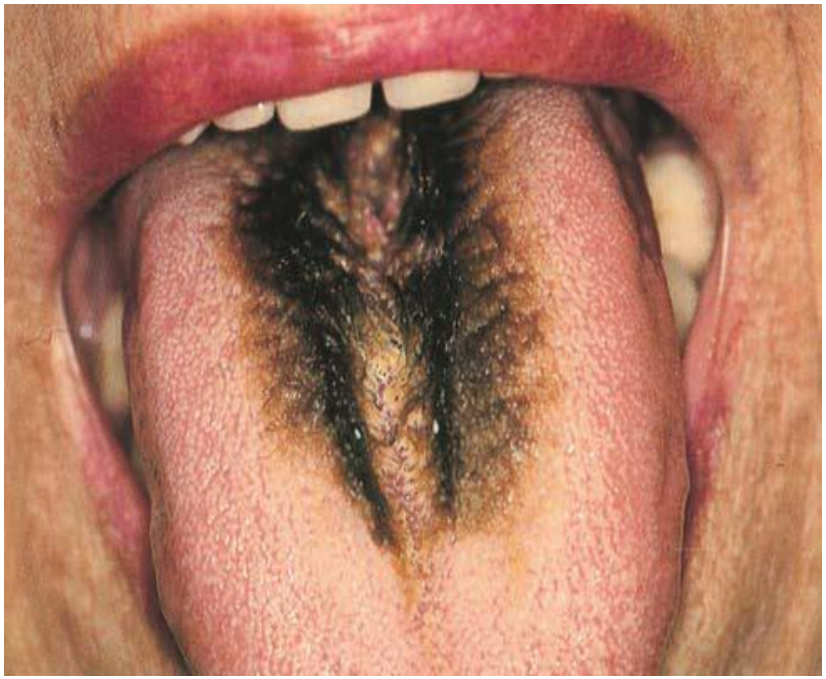
Hairy tongue is characterized by marked accumulation of keratin on the filiform papillae of the dorsal tongue, resulting in a hair like appearance, The condition represents an increase in keratin production or a decrease in normal keratin desquamation

PREDISPOSING FACTORS

- **Smoking,**
- **Antibiotic therapy**
- **Poor oral hygiene**
- **Radiation therapy**
- **Use of oxidizing mouthwashes or antacids**
- **Overgrowth of fungal or bacterial organisms**

CLINICAL FEATURES

- Commonly affects the midline just anterior to the circumvallate papillae, sparing the lateral and anterior borders.
- The elongated papillae are usually brown, yellow or black as a result of growth of pigment-producing bacteria or staining from tobacco and food.
- The condition is typically asymptomatic,
- Occasional patients complain of a gagging sensation or a bad taste in the mouth.



Black hairy tongue

TREATMENT

- **Any predisposing factors such as tobacco, antibiotics or mouthwashes should be eliminated**
- **Excellent oral hygiene should be encouraged.**
- **Desquamation of the hyperkeratotic papillae can be promoted by periodic scraping or brushing with a toothbrush or tongue scraper.**
- **Use Keratolytic agents such as podophyllin**

THANK YOU