

## ***DISEASES OF THE ORAL MUCOSA***

The oral cavity is lined by a membrane composed of stratified squamous epithelium. This epithelium serves as a cover for the oral soft tissues as a barrier to the entry of external pathogenic factors. Depending on the intraoral site, the stratified squamous epithelium may be non-keratinized, orthokeratinized or parakeratinized.

Knowledge of clinical aspects of oral mucosal diseases must be correlated with oral anatomy. E.g. recurrent aphthous stomatitis occurs primarily on the nonkeratinized mucosa, whereas recurrent herpes simplex infections occur almost exclusively on the keratinized mucosa.

The oral mucosa is divided into 3 types:

- 1- Keratinized mucosa (functional mucosa)  
e.g.: gingival and hard palate.
- 2- Non-keratinized mucosa (lining mucosa)  
e.g.: floor of the mouth, cheek.
- 3- Specialized mucosa  
e.g.: dorsal surface of the tongue & it is carrying taste buds.

### **Definitions:**

A **lesion**: is any wound or pathologic alteration of tissue.

Oral mucosal diseases are characterized by one or more lesions that can be categorized into these basic types;

**\*Macula**: A focal area of color changes which is not elevated or depressed in relation to its surroundings.

e.g.: amalgam tattoo, rash of secondary syphilis.

Amalgam tattoo

Amalgam can be incorporated into the oral mucosa in several ways.

- 1- Previous areas of mucosal abrasion can be contaminated by amalgam dust within the oral fluids.
- 2- Broken amalgam pieces can fall in to extraction sites.

3- If dental floss becomes contaminated with amalgam particles of a recently placed restoration, linear areas of pigmentation can be created in the gingival tissues as a result of hygiene procedures.

4- Amalgam from endodontic retro fill procedures can be left within the soft tissue at the surgical site.

5- Finally, fine metallic particles can be driven through the oral mucosa from the pressure of high-speed air turbine drills.

\***Papule**: A solid, raised lesion which is less than 5 mm in diameter.

e.g.: popular lichen planus.

\***Nodule**: A solid, raised lesion which is greater than 5mm in diameter.

e.g.: fibroma.

\***Sessile**: Describing a tumor or growth whose base is the widest part of the lesion.

\***Pedunculated**: Describing a tumor or growth whose base is the narrower than the widest part of the lesion.

\***Papillary**: Describing a tumor or growth show numerous surface projections.

\***Verrucous**: Describing a tumor or growth show a rough, warty surface.

\***Vesicle**: A superficial blister, 5mm or less in diameter usually filled with clear fluid.

e.g.: burns, herpetic lesions.

\***Bulla**: A large blister, greater than 5mm in diameter, it may form when several vesicles coalesce.

e.g.: pemphigus & penphigoid.

Vesicles can be of two types:

- Sub epithelial vesicles (accumulation of fluid is beneath the stratum basalis so that all the layers of epithelium are raised).
- Intra epithelial vesicles are those in which the fluid collects within the epithelial layer, usually the stratum spinosum, and the basal layer remains attached to the C.T.

\***Pustule**: A blister filled with purulent exudates (pus).

\***Ulcer:** A lesion characterized by loss of the necrosis appears as white or yellow membrane & is surrounded by a red halo; the border may be punched out, undermined, rolled & raised.

e.g.: aphthous, cancer.

\***Erosion:** Refers to a partial loss of the surface epithelium e.g.:

traumatic erosion caused by tooth brushing.

\***Fissure:** A narrow, slit like ulceration or groove.

\***Plaque:** Is a small or large demarcated patch that can be smooth or fissured

e.g.: leukoplakia.

\***Petechia:** A round, pinpoint area of hemorrhage.

\***Ecchymosis:** A non-elevated area of hemorrhage larger than petechia.

\***Telangiectasia.** A vascular lesion caused by dilatation of a small, superficial blood vessel.

\***Cyst:** A pathological epithelium lined cavity after filled with fluid or semi fluid contents & surrounded by a fibrous C.T. capsule.

\***Tumor:** Is a swelling of a part, considered as neoplastic solid growth projecting outward or infiltrates downward.

e.g.: a hemangioma(benign tumor)

Carcinoma or cancer is malignant tumor.

\***Hamartoma:** tumor like mass composed of multiple tissues normally present in the region or part e.g. odontoma.

\***Teratoma:** tumor like mass composed of multiple tissues foreign to the part from which it arises e.g. tooth in ovary

\***Choristoma:** tumor like mass of developmental origin in which there are found in tissue foreign to the part (single type of tissue) e.g. bone or cartilage present in the tongue

\***Atrophy:** Refer to reddened area of the mucosa where the epithelium is thin & the blood supply of the C.T. is seen, it differs from erosion in that there are less cells in the epithelium due to atrophy of the epithelium, not because of trauma.

e.g.: geographic tongue where the filiform papillae are lost as well as in vitamin deficiency states, anemia.

**\*Scar:** Is a white depressed mark line or area that represents healing after injury. It is rare in the oral cavity but is seen following gingivectomy, apicectomy.

**\*Crust:** Is a scab or dry outer layer usually seen with brown pigmentation of skin or outer surface of lips.

### ***CHANGES IN THE COLOR OF ORAL MUCOSA***

The normal color of the oral mucosa is pink or pinkish red which comes from the reflecting color of the highly vascular sub mucosa.

Changes in the color of oral mucosa can be seen as brown or black mucosa due to the presence of pigmentation in the mucosa, sometimes the case may be very dangerous like in melanoma.

Any change in color or consistency of the normal oral mucosa may indicate a pathologic condition which may be very simple like erosion or serious like sq.cell ca.

The cause of such change may be physical like trauma or chemical like long term aspirin use or some time microbial cause (fungal, bacterial or viral) also some time we see oral manifestation of systemic disease that's why it is said that the oral cavity is the mirror of the body.

### ***MICROSCOPIC CHANGES OF THE ORAL MUCOSA***

The microscopical changes seen in the oral mucous membrane consequent to pathologic condition can be divided into those of the epithelium and those of the C.T.

These changes may be more striking in the epithelium or in the CT. or even both.

***\*Epithelial changes:***

**Hyperkeratosis:** Refers to an increase or widening in the stratum corneum.

This result in excess keratin (hyperorthokeratosis) or parakeratin (hyperparakeratosis) at the surface & yields a white appearance clinically.

This hyperkeratinization can occur in keratinized area or nonkeratinized area.

If the white surface is in the form of a patch it is called **leukoplakia**.

**Hyperplasia:** Refer to increase in the thickening of epithelium from the surface down to the basal cell layer.

Hyperplasia of the epithelium occurs with the widening or increase in the number of cells in the stratum spinosum we called this (A canthosis). This thickening also would result in a white lesion.

### **Epithelial dysplasia (dyskeratosis) or epithelial atypia**

It is a serious condition refers to the abnormal growth pattern or disorientation of the normal layer of epithelium. It generally indicates premalignant changes. The changes can be so severe that they resemble cancer in which case the term carcinoma in situ is used because all the cellular characteristics of cancer are present but are confined to the epithelium with no invasion into the C.T.

This also can be a white or red lesion.

Once the lesion invades the CT. it is also called squamous cell carcinoma or intra epithelial carcinoma.

### **SPONGIOSIS:**

Refer to the accumulation of fluid within the cells of fluid within the cells of the stratum spinosum.

This reflects a degeneration of these cells & the microscopic picture resembles a sponge.

Clinically the lesions appear white and are most commonly seen on the buccal mucosa as leukoedema.

### ***CONNECTIVE TISSUE CHANGES***

inflammatory infiltrates are common.

Most often chronic inflammatory cells are present e.g.: gingivitis.

Hyperplasia of CT. refers to an increase in the amount of collagen.

Glandular and ductal destination can be seen in the many accessory mucous glands due to pressure and obstruction.

### **\*Generally, oral mucosal lesions are divided into:**

White lesions, Red lesions, Vesiculo-ulcerative lesions, Infectious disease (bacterial fungal and viral).

## ***Bacterial infections:***

### ***Tuberculosis***

Is a chronic infectious disease caused by the tubercle bacillus (mycobacterium tuberculosis).

The most frequent type is pulmonary tuberculosis; this type may remain localized but may spread as well through the blood stream to among other organs as in kidney or liver (miliary tuberculosis) or through the lymph vessels.

Tuberculous infection of the submandibular & cervical lymph nodes also referred to as (scrofula) may locally give rise to abscess formation or may remain stationary as a granulomatous lesion.

Tuberculosis may also primarily affect the skin; this type is called (lupus vulgaris) such primary tuberculous lesion rarely affect the oral mucosa.

The mechanism of spreading of microorganism to the oral mucosa has not been identified.

\*It appears most likely that:

-The microorganism is carried to the oral tissue by the sputum.

-The microorganism may be carried by hematogenous route.

Primary oral tuberculosis without pulmonary involvement is rare, when present the oral involvement of primary tuberculosis usually the gingival, mucobuccal fold, and area of inflammation adjacent to teeth.

Secondary oral lesion mostly present on the tongue, palate & lip.

The typical lesion is an ulcer on the mid-dorsum of the tongue, the ulcer is typically angular with over hanging edges which appear indurate and hard.

Histological features of tuberculosis:

The cell-mediated hyper sensitivity reaction is responsible for the classical histological formation of granuloma.

One granuloma called tubercle.

Area of infection demonstrates the formation of granulomas which are circumscribed collection of epithelioid histocytes, lymphocytes & multinucleated giant cells (Langhans' cell) with central caseous necrosis.

Tuberculous osteomyelitis occasionally occurs.

Special stain Ziehl —Neelsen or other acid fast stain.

Management of tuberculosis:

Tuberculin test (Mantoux) skin test (+) indicate exposure to the organism and doesn't distinguish infection from active diseases.

Diagnosis is confirmed by biopsy, chest radiography & a specimen of sputum. Mycobacterial infection is confirmed by culture (4-6 w),

(PCR) POLYMERASE CHAIN REACTION to identify M TUBERCULOSES DNA may accelerate this diagnosis without the need to wait on culture result.

Oral lesion clears up rapidly, if there is effective multidrug chemotherapy for the pulmonary infection.

No local treatment is needed.

Isoniazid (INH) + RIFAMPIN for 9 M.

Refadin cap, ethanbutal & INH. Tab.

### ***SYPHILIS (LUES)***

It is a venereal disease caused by a spirochete the *Treponema palladium*.

The spirochetes are transmitted from one person to another by intimate sexual contact or by close body contact involving the sex organs, mouth or rectum.

The organism is fragile & cannot live long in light and air, they require warm & moist area for survival.

To enter the body the spirochetes must penetrate mucosa or skin, usually through a wound or area that is not intact.

\*syphilis may be classified as either:

Acquired type.

Congenital type.

### Acquired type:

The infection takes place through sexual intercourse with an infected partner. A physician or dentist may be infected by a patient with a lesion of the oral mucosa during the second stage of the disease which is extremely contagious stage.

The disease has a natural course of three stages with two periods of remission if preventive measures are not taken.

#### Primary stage:

Is characterized by the appearance of **chancre**, this primary chancre develops at the site of initial inoculation about 3-4 weeks following intimate contact.



90% of the lesions occur on the genitalia & 10% occur in or about the mouth, on the lip, tongue or palate.

Chancre consist initially of a firm nodule in which the surface break down after a few days, leaving a rounded hard ulcer with raised indurate edges, this may resemble a carcinoma if present on the lip.

A chancre is typically painless but regional lymph nodes are enlarged.

The ulcer heals spontaneously in weeks, serological test is negative at first and the diagnosis depend on finding treponema palladium by dark ground illumination of a smear from the chancre.

#### Secondary stage:

Secondary stage develops 1-4 months after infection. It typically caused mild fever with malaise, headache, sore throat soon followed by a rash and stomatitis.

The skin rash is composed of numerous red macule and papules. These eruptions can occur in the mouth usually on the palate.





In the oral cavity, multiple, asymptomatic white-gray plaques may appear on the tongue, gingiva, palate and the buccal mucosa.

The discharge from the ulcers contains many spirochetes & saliva is highly infective always positive in this stage.

The serological findings are always positive in this stage.

Treatment in this stage with long acting antibiotic, mostly penicillin.

In compromised immune system, secondary syphilis can exhibit an explosive and wide spread form known as Lues maligna (fever, headache and myalgia followed by the formation of necrotic ulceration (face and scalp), 30 % of affected patients will show oral lesions, malaise, pain and arthralgia.

Tertiary syphilis:

Between secondary and tertiary stages there is latent period which is about 1-30 years.

The third stage of syphilis manifests itself primarily with changes in the nervous system and cardiovascular system. There is tissue destruction without regeneration & patient suffers from insanity, loss motor control and balance. The aorta of the heart in some patient is damaged & caused heart disease.

Beside these major findings, there can be oral lesion at this stage:

A tropic glossitis: The tongue appears smooth, shiny due to loss or atrophy of the papilla.

The gamma is other lesions of tertiary syphilis that can involve the oral cavity mostly affect the palate, tongue or tonsils. Vary from one to several inches in diameter.

It begins as a swelling sometimes with yellowish center which undergo necrosis leaving a painless deep ulcer. The ulcer is rounded with soft punched-out edges. The floor is depressed & pale.

In the palate, the destruction may cause a perforating through the soft tissue and bone of the hard palate leaving a permanent opening from the mouth to the floor of the nose.



Leukoplakia of the tongue may also develop during the late stage.

\*the lesions are not contagious at this stage.

### **Congenital syphilis:**

Is not venereal but is passed on to the fetus by an infected pregnant woman. If the woman is treated within the first three months of pregnancy the fetus will not be affected.

The classical symptoms of congenital syphilis consist of the triad of Hutchinson:

-Hypoplasia of the incisors and molars (mulberry molars)



-Central notching of the incisal edge & a tapering screw-driver appearance.



-Deafness due to involvement of the 8th nerve (acoustical nerve).

-Interstitial keratitis.

Various other abnormalities have been described such as under development of the maxilla, a high arched palate & a saddle nose.

#### DIAGNOSIS:

Dark —field examination of a smear: spiral Microorganism.

False-positive result due to morphologic similar to oral inhabitants such as (*T.microdentium*,*T.macrodentium*, *T.mucosum* ) and should be confirmed on specific IF anti body or serologic test

Several nonspecific, and not highly sensitive serologic screening test for syphilis are available, these include :

- 1- Venereal disease research laboratory (VDRL)
- 2- The rapid plasma reagin (RPR)( 1 and 2 + , latency -).

Specific and highly sensitive serologic tests

- 1- Fluorescent treponemal antibody absorption (FTA)
- 2- Treponemal pallidum partical hemagglutination assays(TPHA) These give + from first lesion to life.

Treatment: Penicillin

The dose and administration depend on stage, neurologic and immune status:

#### **ACTINOMYCOSIS:**

Is caused by gram-positive, anaerobic actinomysis israeli.

Actinomycosis proceeds as a granulomatous infection producing abscesses, the pus often contains yellow sulphur granules.

\*There are 3 anatomic variants:

The cervicofacial type.

The abdominal type.

The pulmonary type.

The actinomycetes commonly inhabit the oral cavity without giving rise to symptoms. However, if a portal of entry has been created in the oral mucosa by trauma or by extraction of tooth, for instance the microorganism can penetrate the underlying tissue.

Although actinomycosis may involve the jaws causing osteomyelitis, most of the lesions are localized in the soft tissue and in the tongue.



Histologically:

On microscopic examination of removed tissue, granulation tissue can be seen with central abscess formation within which may be seen the characteristic colonies of M.O., the individual clones appear lobulated or round with peripheral radiating filaments. There are also multinucleated giant cells & macrophages particularly around the periphery of the lesion.

Diagnosis & treatment:

History & clinical appearance suggest cervicofacial actinomycosis.

Demonstration of the M.O. on the tissue.

Culture of the M.O.

Demonstration of sulphur granules.

Fluorescen-conjugated antiserum can be used on the granules to identify the actinomyces species.

Treatment by penicillin and tetracycline in a high dose over a long period of time is in general most successful.

### **Necrotizing Ulcerative Gingivitis**

Necrotizing ulcerative gingivitis is a relatively rare specific infectious gingival disease of young persons. *Fusobacterium nucleatum*, *Treponema Vincentia*, and probably other bacteria play an important role.

Predisposing factors are emotional stress, smoking, poor oral hygiene, local trauma, and HIV infection.

Clinical features:

The characteristic clinical feature is painful necrosis of the interdental papillae and the gingival margins, and the formation of craters covered with a gray pseudomembrane. Spontaneous gingival bleeding, halitosis, and intense salivation are common. Fever, malaise, and lymphadenopathy are less common. Rarely, the lesions may extend beyond the gingiva (necrotizing ulcerative stomatitis).

Treatment: Systemic metronidazole and oxygen releasing agents topically are the best therapy in the acute phase, followed by mechanical gingival treatment.

NOMA (Concrum oris: Gangrenous stomatitis: Necrotizing stomatitis)

Noma is a creek word meaning to devour.

It is a rapidly progressive opportunistic infection caused by components of the normal oral flora that become pathogenic during periods of compromised immune status. The condition is rare in developed countries. Necrosis of tissue occurs as a consequence of invasion by anaerobic bacteria.

The predisposing factors:

- 1-Poverty.
- 2-Malnutrition or dehydration.
- 3-Poor oral hygiene.
- 4-Recent illness.
- 5-Malignancy.
- 6-An immune deficiency disorders like AIDS.
- 7- Poor sanitation.
- 8- Proximity to livestock.

The infection begins as necrotizing ulcerative gingivitis

Clinically: typically arise in children age 1 to 10 years and start in the gingiva as NUG

(inflamed interdental papillae, punched-out necrosis that cover with gray pseudomembrane, bad odor , pain , spontaneous hemorrhage lymphadenopathy , fever, and malaise ) which may extend facially or lingually to involve the adjacent soft tissue and form area of NUM .

Treatment. Therapy involves treating the underlying predisposing condition, as well as the infection itself. Therefore fluids, electrolytes, and general nutrition are restored, along with the introduction of antibiotics

Appropriate antibiotic (penicillin and metronidazole)