

White & Red Lesions of The Oral Mucosa

Useful dermatological, clinical and pathological terms:

Macule: A macule is a change in the surface color of skin or mucosa without elevation or depression, non-palpable, well or ill-defined variously sized, but generally less than 5-10mm (or less than 1cm) in diameter. These are lesions that are flush with the adjacent. They may be red due to increased vascularity or inflammation, or pigmented due to the presence of melanin, hemosiderin, and foreign materials (including the breakdown products of medications). A good example in the oral cavity is the melanotic macule.

Patch: A patch is a large macule equal to or larger than 5-10mm (or larger than 1cm) in diameter. Patch may have some surface change such as fine scale or wrinkling, however, the lesion itself still not palpable.

Papule: Is a circumscribed solid elevation (slightly domed or flat-topped) of the skin or mucosa with no visible fluid, varying in size from pinhead to less than 5-10mm (or less than 1cm) in diameter.

Plaque: Described as either a broad papule or confluence of papules equal to or greater than 10mm (or larger than 1cm). Or alternatively as an elevated, plateau-like lesion that is greater in its diameter than its depth.

Nodule: A nodule is morphologically similar to a papule that it is also a palpable spherical or dome shaped lesion less than 10mm (or less than 1cm) in diameter. However, it is differentiated by being centered deeper in the dermis or subcutaneous tissue (Endophytic) or sub-mucosa (Exophytic). A good example of an oral mucosal nodule is a fibroma.

Tumor: similar to nodule but larger than 10mm (or larger than 1cm) in diameter.

Blister: Is a small skin or mucosal elevation containing body fluid (serous, lymph, serum, plasma, blood or pus).

Vesicle: A vesicle is small blister, a circumscribed, fluid-containing, epidermal or mucosal elevation generally less than either 5-10 mm in diameter (less than 1cm). The fluid content is clear serous fluid.

Bulla: A bulla is a large blister, rounded or irregularly shaped containing clear serous or purulent fluid. Its size is larger than 5-10mm (greater than 1cm).

Pustule: A pustule is a small elevation (blister) of the skin or mucosa containing cloudy or purulent material (pus) usually consisting of necrotic inflammatory cells. They appear yellow, white or red.

Telangiectasia: Represents an enlargement of superficial blood vessels to the point of being visible.

Purpura: These are reddish to purple discolorations caused by blood from vessels leaking into the connective tissue. These lesions do not blanch when pressure is applied and are classified by size as petechiae (less than 0.3 cm), purpura (0.4–0.9 cm), or ecchymoses (greater than 1 cm).

Scale: Dry or greasy laminated masses of keratin that represent thickened stratum corneum.

Crust: Dried sebum (sebaceous secretion), pus, or blood usually mixed with epithelial and sometimes bacterial debris.

The oral cavity is lined by oral mucosa which is composed of Oral Epithelium & Sub-mucosa

According to its function, the oral mucosa is divided into:

1. Masticatory mucosa 2. Lining mucosa
3. Specialized mucosa

Why lesions appear white?

Mucosal lesions appear white due to:

1. Increased thickness of epithelial covering
2. Abnormal keratinization of non-keratinized epithelial surfaces (metaplasia) such as keratinization of non-masticatory (lining) mucous membrane of the oral cavity
3. Hyperkeratosis which is increased or excessive production of keratin
4. Imbibition of fluid (water, saliva) by the upper layer of mucosa
5. Tissue necrosis

Why lesions appear red?

Mucosal lesions appear red due to:

1. Thinning of epithelial covering (erosion, atrophy)
2. Reduced epithelial keratinization
3. Abnormal cell turnover during healing
4. Blood leakage into surrounding tissue due to trauma
5. Vasodilation during inflammation and vascular proliferation in tumor (neoplasm)
6. As part of dysplasia (pre-malignant and malignant)

Classification of White and Red lesions

1. Normal variation: I. Leukodema II. Fordyce's granules
 III. Linea alba IV. Morsicatio

2. Developmental: I. White spongy nevus II. Median rhomboid glossitis

3. Traumatic: I. Traumatic keratosis
 II. Nicotinic stomatitis (Stomatitis nicotina)
 III. Papillary hyperplasia of the palate

4. Infective: I. Candidiasis (Candidosis) II. Syphilis III. Measles or Rubeola
5. Blood dyscrasias: I. Anemia II. Plummer Vinson syndrome
 III. Vitamin A deficiency
6. Drugs: I. Chemical burn (Aspirin & other medications)
 II. Drug reactions: a. Lichenoid drug reaction b. Stomatitis venenata
 c. Stomatitis medicamentosa
7. Dermatological: I. Lichen planus II. Lupus erythematosus III. Psoriasis
8. Premalignant: I. Leukoplakia II. Erythroplakia
 III. Submucous fibrosis
9. Malignant: Squamous cell carcinoma
10. Miscellaneous: I. Oral skin graft II. Geographic tongue
 III. Coated tongue

Leukodema

It's a common variation of the normal oral mucosa. Appears as a greyish-white milky film on the buccal mucosa and soft palate, especially in dark skinned people (Negros) and heavy smokers. It represents a normal anatomical variation that can be accentuated by smoking. It's asymptomatic & found on routine oral examination. It can't be removed with tongue blade.

D.D: Lichen planus, Leukoplakia, Cheek biting & White spongy nevus

Diagnosis: 1. Clinical appearance 2. Histopathology
3. Stretching test (disappears by stretching)

Treatment: Reassurance

Fordyce's granules

They are common congenital lesions seen mostly in elder patients. Represent ectopic sebaceous glands. Mostly found on the buccal mucosa and the lips (labial mucosa). Commonly, they are soft, asymptomatic, and symmetrically distributed yellowish creamy spots with few millimeters in diameter. Sometimes appear as clumps of spots or small white-yellowish sub-mucosal patches.

Diagnosis: 1. Clinical appearance 2. Biopsy

Treatment: Reassurance

Linea alba

Is a horizontal white line on the buccal mucosa at the level of the occlusal plane extending from the mouth commissure to the posterior teeth. It is a very common finding and is most likely associated with pressure or frictional irritation (as in bruxism), or sucking trauma from the facial (labial, buccal) surfaces of the teeth (negative pressure such as during sucking or heavy shisha/ pipe smoking).

Clinical features:

1. Linea alba buccalis usually present bilaterally and may be pronounced in some individuals.
2. It is more prominent in individuals with reduced overjet of posterior teeth.
3. It is often scalloped and restricted to dentulous areas.

Treatment:

1. No treatment (Reassurance). It may disappear spontaneously
2. If not disappear, then apply Keratolytic agent
3. Remove the cause (example Bite plate in bruxism)

Morsicatio

Morsicatio (also known as “morsicatio mucosae oris”) refers to biting or nibbling of the oral mucosa. Common sites for this habitual nibbling include the tongue (morsicatio linguarum), buccal mucosa (morsicatio buccarum), and labial mucosa (morsicatio labiorum). The patient may or may not be aware of the habit (asymptomatic), and some investigators have suggested an association with stress or psychological disorders. The chronically traumatized mucosa develops a white to red-white plaque/patch with a rough, ragged, or macerated appearance. Sometimes the patient can remove thread-like shreds of keratin from the surface. Accompanying ulceration or erosion also is possible on continuous biting/nibbling.

Diagnosis:

The characteristic clinical presentation is sufficient for the diagnosis, although biopsy may be performed if there is uncertainty. Microscopic examination shows a thickened, shredded keratin layer.

Treatment:

1. No treatment (Reassurance)
2. Stop or abstain the habit and the lesion will disappear spontaneously
3. To remove the cause, Bite plate or habit breaker may be constructed
4. If not disappear, then apply Keratolytic agent

White sponge nevus

White sponge nevus (Cannon's disease) is a developmental keratotic lesion inherited as an autosomal dominant trait (mutation in the keratin genes), it affects the mouth and other mucosal surfaces. It appears from infancy to adolescence. Affected mucosa appears white thickened, folded or corrugated lesions with spongy soft texture. WSN is asymptomatic, in the oral cavity it involves the buccal mucosa and floor of the mouth usually bilaterally. Other mucosal surfaces may be affected such as vagina, anus and nasal cavity.

Diagnosis:

1. Clinical appearance
2. Positive family history
3. When confused with leukoplakia, biopsy is indicated to confirm the diagnosis

Treatment: Reassure the patient that the condition is benign. If it is causes extreme discomfort, surgical excision and grafting can be performed.

Median rhomboid glossitis

Described as rhomboid, diamond or rounded area of depapillation in the midline of the dorsum of the tongue at the junction of the ant. 2/3 and post. 1/3 anterior to the v-shaped circumvallate papillae. The lesion is asymptomatic and seen in adults. Mostly appear as a red depapillated

area, alternatively it may be white. It may have a nodular appearance, or flat/slightly depressed area. In some cases, it may appear nodular fibrous with epithelial hyperplasia. MRG location on the tongue suggests that it may be developmental represents a remnant of the tuberculum impar, however, as it is not commonly seen in children this suggestion is no longer accepted. It has now been recognized that MRG is often associated with *candida*.

Diagnosis:

1. Clinical appearance
2. Swab and culture to demonstrate *candidal* hyphae (Gram stain)
3. Biopsy is indicated to rule out carcinoma

Treatment:

1. Reassurance
2. When *candidal* hyphae detected, the lesion treated with topical antifungal drug
3. If the lesion remains, follow up for any enlargement or change is indicated

Traumatic keratosis (Frictional Keratosis)

It refers to an isolated area of thickened whitish oral mucosa that is related to an identifiable local irritant and resolves following elimination of the irritant. It's usually found in association with denture clasps, rough edges of denture, sharp edges of restorations, broken teeth, lips of heavy cigarette smokers and buccal mucosa opposite the molar teeth. Early cases appear grayish white, later becomes dense, firm and white.

Diagnosis: Demonstrate the irritant factor & Biopsy (if suspected)

Treatment: Reassurance & Remove the irritant (cause)

Nicotinic stomatitis (stomatitis nicotina)

It's a specific lesion that develops on the palate of heavy cigarette, pipe and cigar smokers. Palatal mucosa appears as grayish white, thickened and/or fissured. Focal thickening occurs around the orifices of the palatal minor S. Gs which appears as white, umbilicated nodules with red centers (orifices of the S. Gs) which may be stained brown by deposits of tar.

Diagnosis: History & Clinical examination & Biopsy (if suspected)

Treatment:

1. Stop smoking & lesion resolves within weeks
2. Follow up of the patient

Papillary hyperplasia of the palate

Appears in denture wearers especially those wearing ill-fitting denture or rocking denture. The lesion is asymptomatic, discovered by clinical examination (sometimes painful), the palatal mucosal lesion appears as polypoid, granulated erythematous elevations.

Diagnosis: history and clinical appearance. Biopsy if suspected.

Treatment:

1. Reassure the patient that the lesion is benign
2. In early cases the lesion will resolve with relief of the denture or construction of new well-fitting denture
3. In advanced cases surgical excision may be required (and biopsied).

Candidiasis (Candidosis)

It's most the common oral fungal infection in humans. Represent classic opportunistic infections caused by *Candida albicans*. C.A is a component of the normal oral flora with as many as 30-50% of people carrying the organism in their mouths without clinical manifestations.

The commensal C.A becomes pathogenic when appropriate predisposing factors exist such as:

1. Acidic saliva
2. Xerostomia
3. Nocturnal denture wearing
4. Heavy smokers
5. Mal-nutrition & mal-absorption syndrome
6. Prolonged use of antibiotics
7. Steroid therapy
8. Radiotherapy (7, 8, 9, 10 & 11 considered Immune-compromised)
9. Chemotherapy
10. HIV infection
11. Endocrine abnormalities
12. Diabetes mellitus
13. Vitamins deficiencies
14. Age (elders & infants)

Antifungal drugs

I. According to mode or site of action:

1. Polyenes: Nystatin (Mycostatin, Nystat), Amphotericin B (Fungizone)

2. Azoles: Imidazole derivatives

Topical: Clotrimazole...Mycelex

Miconazole..Micogel

Econazole

Systemic: Ketoconazole..Nizoral

3. Triazole: Systemic

Fluconazole. Diflucan

Itraconazole. Sporanox

4. Others: Gentian violet 1% (Crystal violet) (Triarylmethane antiseptic dye)

II. According to route of administration:

1. Topical (local): Amphotericin B (Fungizone),

Clotrimazole (Mycelex), Econazole (Spectazole),

Itraconazole (Sporanox), Miconazole (Monistat, Micatin),

Nystatin (Mycostatin)

2. Systemic: Fluconazole (Diflucan), Itraconazole (Sporanox)

Ketoconazole (Monistat, Micatin)

Nystatin: 100000. IU, 200000. IU, & 500000. IU 1×4...daily

Pastilles, Drops

Amphotericin B: 100mg/20ml suspension

50mg... powder for injection

1×4 daily

Clotrimazole: Gel, Lotion, Solution

Troche.100mg..200mg..500mg

Ketoconazole: 200mg. tab..once daily

50mg, 100mg, 150mg, 200mg tab... IV.

Itraconazole: 100mg, 200mg cap

Pseudomembranous candidiasis (Thrush):

It's an acute *candidal* infection, **characterized by:**

1. Development of soft friable adherent creamy white plaques (pseudo-membranes) on the oral mucosa
2. Distinctive feature of these plaques is that they can be wiped off easily by scrapping them with a tongue blade leaving an erythematous (bleeding raw mucosal) areas
3. Most commonly occur on the palate (soft & hard), buccal mucosa, labial mucosa & tongue. Angle of the mouth may be associated (angular stomatitis)
4. Symptoms: Burning sensation & abnormal taste (metallic taste)

Diagnosis:

1. History: If patients not infants or elderly, any adult male/female who develops thrush without apparent cause HIV infection or other immunological disturbances should be suspected. However, any form of candidiasis can be secondary to HIV infections
2. Clinically: Presence of the lesions which could be removed by scrapping
3. Laboratory:
 - a) +ve swab and culture on Sabouraud's dextrose agar to see the colonies
 - b) PAS stain (periodic acid schiff reagents) and Gram-stain demonstrate the candidal hyphae

Neonatal thrush: Due to

Milk fermentation

Immaturity of the immune response

Acquired during passage through birth canal

Treatment of Thrush:

Correction of systemic background &/ antifungal therapy

1. Nystatin (Mycostatin[®]): Tablets 500000 U

Suspension 100000 U in 60 ml & 473 ml units

Topical cream (or ointment) 100000 U/g in 15 g & 60 g units

Lozenges 200000 U

2. Mycostatin drops

3. Miconazole: Topical Oral Gel (Daktarin[®]) Each gram of the gel contains 20 mg of miconazole

Other forms (cream & ointment)

4. Amphotericin B (Fungizone[®]): Topical or oral suspension 100 mg/ml in 24 ml (1ml q.i.d)

5. Gentian violet

Erythematous candidiasis:

I. Acute atrophic candidiasis or antibiotic sore mouth

Mostly follows a course of broad-spectrum antibiotics.

Could be found in:

1. AIDS & immunocompromised patients
2. Prolonged use of systemic and local steroids
3. Iron deficiency anemia
4. Misdiagnosed with the raw areas of thrush after the white patches have been scraped off

Clinically characterized by:

1. Burning sensation
2. The affected mucosa appears red

For instance, when the tongue is affected, it may be associated with diffuse loss of the filiform papillae resulting in a reddened (erythematous) bald tongue

Treatment:

1. Treat the underlying condition (Ex. Stop or change the antibiotic)
2. Antifungal (topical & if not respond systemic)

II. Central papillary atrophy of the tongue or Median rhomboid glossitis

MRG are usually asymptomatic and chronic. It presents as a well demarcated erythematous zone with smooth or populated surface.

Treatment: Topical Antifungal

III. Chronic multifocal candidiasis

This is a form of chronic *candidal* infection involving multiple areas in the mouth.

Areas involved: Tongue (MRG), angle of the mouth, in addition to junction of the hard & soft palate. Palatal lesions appear red (erythematous)

Treatment: Antifungal (systemic)

IV. Angular cheilitis or Perleche

Angular cheilitis (Angular stomatitis, Cheilosis, Perleche). It's a bilateral chronic inflammation of the corner (commissure) of the mouth

Characterized by erythema, fissuring and scaling. Typically seen in elders with reduced vertical dimension, however, may occur in other age groups

Microbiological studies revealed that the lesion is caused by both *Candida albicans* and *Staphylococcus aureus*

Treatment:

1. Identify the predisposing factors
2. Topical antifungal &/ antibiotic such as fusidic acid cream (Fucidin®)
3. Increase the vertical dimension if needed

V. Chronic atrophic candidiasis or Denture associated stomatitis

It occurs in denture wearing patients, especially those wearing a well-fitting denture overnight. The denture isolates the underlying or bearing mucosa from the protective/washing action of saliva.

Its characterized by varying degrees of asymptomatic erythema localized to the denture bearing areas of a maxillary removable dental prosthesis. Smoking increase the susceptibility of this infection. Angular cheilitis maybe associated and may represent the chief complain.

Previously Denture stomatitis was thought to be attributed to allergy to denture base material or sensitivity to remnants of methylmetharylate monomer.

Denture stomatitis is classified into three different types. **Type I** is limited to minor erythematous sites caused by trauma from the denture. **Type II** affects a major part of the denture-covered mucosa. In addition to the features of **type II**, **Type III** has a granular mucosa.

The denture serves as a vehicle that accumulates sloughed epithelial cells and protects the microorganisms from physical influences such as mastication & salivary flow. The microflora is complex and may, in addition to *C. albicans* (main causative MO) contain bacteria from several genera, such as *Streptococcus*-, *Veillonella*-, *Lactobacillus*-, *Prevotella*- (formerly *Bacteroides*), and *Actinomyces*-strains. It is not known to what extent these bacteria participate in the pathogenesis of denture stomatitis.

Diagnosis: Smear from denture base. Swab and culture

Treatment:

1. Instruct the patient to stop wearing the denture for 1-2 weeks, meanwhile, soak the denture in 0.1 hypochlorite or chlorhexidine overnight, to eliminate *C.albicans* from the denture base

2. Topical antifungal: Coat the denture with miconazole gel and wear it, then remove it, clean & scrub the base, and apply the gel again, this is done t.i.d for 1-2 weeks till the fungi eliminated
3. In resistant cases, itraconazole or fluconazole may be given orally, however, topical treatment is safer
4. When there is no response, underlying conditions should be inspected and treated such as iron deficiency anemia the chief complain

Chronic hyperplastic candidiasis or Candidal leukoplakia

This type of chronic candidiasis affects adults of middle age or older. CHP characterized by a white patch (plaque) that can't be removed by scraping. The plaque has variable thickness & often rough or irregular in texture.

The lesion may also be nodular with an erythematous background (mixed red and white areas) resulting in a speckled leukoplakia. Such lesions may have an increased frequency of epithelial dysplasia.

It's most commonly found on:

- a. The buccal mucosa & may extend to the commissural mucosa
- b. Dorsum & laterodorsal surfaces of the tongue
- c. Labial mucosa (less)

Diagnosis:

1. Clinically: Appearance & non scraped-off lesion
2. Biopsy: To confirm and differentiate the lesion from idiopathic leukoplakia &/ erythron-leukoplakia or erythroplakia

Treatment:

1. Systemic antifungal such as fluconazole for several months

2. Unresponsive lesions need surgical excision and grafting with antifungal treatment to prevent recurrence if there are any remnants

Mucocutaneous Candidiasis MCC

Chronic mucocutaneous candidiasis syndromes are group of rare candidiasis which are difficult to manage. They are considered as a rare group of immunological disorders

There are 4 main types of MCC:

1. Familial (limited) type
2. Diffused type (*Candidal* granuloma)
3. Endocrine candidiasis syndrome
4. Late-onset (Thymoma syndrome)

Generally characterized by candidiasis of the mouth, nails, skin and other mucosal surfaces. **Oral lesions** appear as thick white plaques which can't be scraped off.

Syphilis

The oral mucosa may be involved in primary, secondary, and tertiary syphilis. Each stage of syphilis has its own clinically distinct oral lesion.

The characteristic oral lesion of **primary syphilis** known as **chancre**. It may occur on the lip, tip of the tongue, & rarely other oral sites. **Chancre** initially appear as a firm nodule about 1cm in diameter. It is typically painless; however, the regional lymph nodes are enlarged & rubbery in texture. Few days later, **chancre** breaks into a rounded ulcer with raised indurated edges (which may resemble carcinoma when occur on the lip). **Chancre** is highly infectious.

Secondary syphilis. The characteristic oral lesion of **2ndry syphilis** is known as **Snail's track ulcer**. Oral lesions rarely appear without the skin

rash, the oral lesions mainly affect the tonsils, lateral borders of the tongue and lips. The **ulcers** are usually flat, covered by greyish membrane and may be irregularly linear. The **ulcers** may coalesce to form well-defined yellowish-white mucous patches. The **ulcers** discharge contains syphilis spirochetes therefore saliva is highly infective

Tertiary syphilis. Gumma is the characteristic lesion of **3ry syphilis** which may affect the palate, tongue or tonsils. Its size may vary from few to several cms. **Gumma** begins as swelling with yellowish center which undergoes necrosis leaving a painless deep ulcer. **Syphilitic leukoplakia** of the tongue may also develop during **3ry syphilis**, which is a premalignant lesion. **Atrophic glossitis** may occur as well.

Treatment of syphilis: Antibiotics, particularly penicillin, tetracycline and erythromycin are also effective.