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Review Article

Red and white lessions of oral cavity a clinical perspective for diagnosis and treatment

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ABSTRACT

The detection of a white and red lesion on the oral mucosa can bring a number of obstacles to the practitioner, since they can range from benign to malignant processes. An important group of ailments characterized by white and red patches of the oral mucosa include infections, traumatic lesions, systemic and local immune-mediated lesions, possibly cancerous disorders, and neoplasms. The oral mucosa is frequently affected with benign white lesions that don't need to be treated. These include birth defects or developmental disorders including Fordyce granules, hereditary benign intraepithelial dyskeratosis, pachyonychia congenita, and white sponge nevus.

While many of the infective and inflammatory conditions for which causes are known can be treated in primary care, some persistent white and red patches, which have the potential to transform to malignancy, require a specialist's attention.

Clinical diagnostic skills and good judgment forms the key to successful management of white and red lesions of the oral cavity.

The primary goal of management of these lesions includes prevention, early detection, and treatment before malignant transformation. The aim of this article is to inform the clinician about management of red and white lesions of oral cavity.

1. Introduction

Oral lesions can be classified into four groups comprising of ulcerations, pigmentations, exophytic lesions, and red-white lesions.[1] White and red patches of the oral mucosa constitute an important group of disorders arising from a diverse spectrum of conditions ranging from traumatic lesions, infectious diseases, systemic and local immune mediated lesions, to potentially malignant disorders or a neoplasm. While many of the infective and inflammatory conditions for which causes are known can be treated in primary care, some persistent white and red patches, which have the potential to transform to malignancy, require a specialist's attention.[2]

The red and white lesions are most commonly affected lesion in the oral cavity. To understand the various colors of this lesion one has to know, the color of oral mucous depends on the Degree of keratinization, dilation, and concentration of blood vessels, the amount of melanin pigment present in the epithelium and thickness of the epithelium. The whiteness of the oral mucosa can be due to acanthosis, hyperkeratosis, and necrosis in oral epithelium, vascularity reducing in the underlying lamina propria, and accumulation of fluid intracellular or extracellular in the epithelium. Same as the red appearance is caused by enlarged blood vessels, atrophic epithelium, and an increase

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in vascularization and a decrease in the number of epithelial cells.[3]

The discovery of a white lesion on the oral mucosa can present a variety of challenges to the practitioner, as they can range from benign to malignant processes. The most common benign chronic white lesions are pseudomembranous candidiasis, erythema migrans, morsicatio buccarum, Linea alba, leukoedema, and lichen planus. White lesions can be found anywhere in the oral cavity, but the above-mentioned lesions typically present either on the dorsal aspect of the tongue or on the buccal mucosa.[4]

In spite of tremendous progress in the field of molecular biology there is yet no single marker that reliably predicts malignant transformation of a potentially malignant disorder of the oral mucosa. Therefore, it is recommended to excise or laser any oral of oropharyngeal leukoplakia/erythroplakia, if feasible, irrespective of the presence or absence of dysplasia. However, it is actually unknown whether such removal truly prevents the possible development of a squamous cell carcinoma. Therefore, lifelong follow-up is recommended at intervals of no more than 6 months.[5]

A routine part of an oral examination should be inspection not only of the teeth and gums but also of the soft tissues in and around the mouth. Dentists look for abnormal changes that are loosely called lesions. Many lesions are innocuous and can be easily diagnosed and named based upon their appearance alone. However, some lesions are not as easy to identify and require additional diagnostic steps, such as a biopsy (removal of a piece of the lesion to examine under a microscope). A small percentage of these lesions may be premalignant or even malignant.

The term 'oral potentially malignant disorders' (OPMD) was recommended at the World Health Organization (WHO) workshop held in 2005. An oral premalignant lesion is defined as any lesion or condition of the oral mucosa that has the potential for malignant transformation. A new term 'potentially premalignant oral epithelial lesion' (PPOEL) has recently been used as a broad term to define both histologic and clinical lesions that have malignant potential. This encompasses lesions such as leukoplakia, erythroplakia, erythroleukoplakia, lichen planus, oral submucous fibrosis, and oral dysplasia. The recognition and management of these premalignant disorders and the understanding of their potential progression to oral cancer will minimize the morbidity and mortality from treatment and will have a direct effect on patient survival.[6]

2. What are Red and White Lesions?

Whiteness of oral mucosa is caused by -

1. Changes in the epithelium such as keratinization of normally nonkeratinized mucosa (such as the buccal mucosa).
2. Increased keratinization of normally keratinized mucosa.
3. Abnormal keratinization of the epithelium.
4. Thickening of the epithelium, and epithelial edema.
5. Fibrosis and/or reduced vascularity of the underlying mucosa may also lead to whiteness which tends to appear deep without discernible surface alterations.[7]

Redness of oral mucosa is caused by-

1. Vasodilation: increased blood vessel diameter commonly occurring with inflammation, but also possible with neoplasia.
2. Vascular proliferation: increased number of blood vessels due to release of growth factors, such as vascular endothelial growth factor (VEGF), during inflammation and as part of neoplasia.
3. Leaky blood vessels (bleeding into tissue): due to trauma, occasionally due to an immune response.
4. Epithelial thinning (atrophy and/or reduced epithelial keratinization): due to abnormal cell turnover during normal healing, in response to trauma, or as part of dysplasia.[7]

A mixture of red and white lesions suggests an irregular epithelial surface that may be caused by a variety of processes, including chronic trauma, inflammation and neoplasia.

3. Management of Red and White Lesions of Oral Cavity

Despite careful clinical evaluation some white lesions elude diagnosis and remain as clinical problems. If initial evaluation proves that the white lesion is due to a reaction to trauma, measures should be taken to remove all possible irritants and re-examine the patient after an interval of ten days. Absence of significant clinical improvement is an indication for immediate biopsy to rule out a possible neoplastic change.

Many white lesions involving the oral mucosa are benign and do not require treatment. These include congenital or developmental conditions such as leukoedema ,white sponge nevus, keratosis follicularis, hereditary benign intraepithelial dyskeratosis, pachyonychia congenita, and Fordyce granules. Other benign conditions that do not require intervention include skin and mucosal grafts, Materia alba associated with the gingiva or tongue, and keratotic lesions such as hairy tongue.[13,14]

Red lesions caused by hyper-sensitivity to drugs, foods or, most commonly, dental materials (eg, denture adhesives, toothpastes, and mouth rinses) can arise anywhere in the oral cavity. Treatment consists of discontinuing the offending substance; up to 40 mg/d of prednisone can

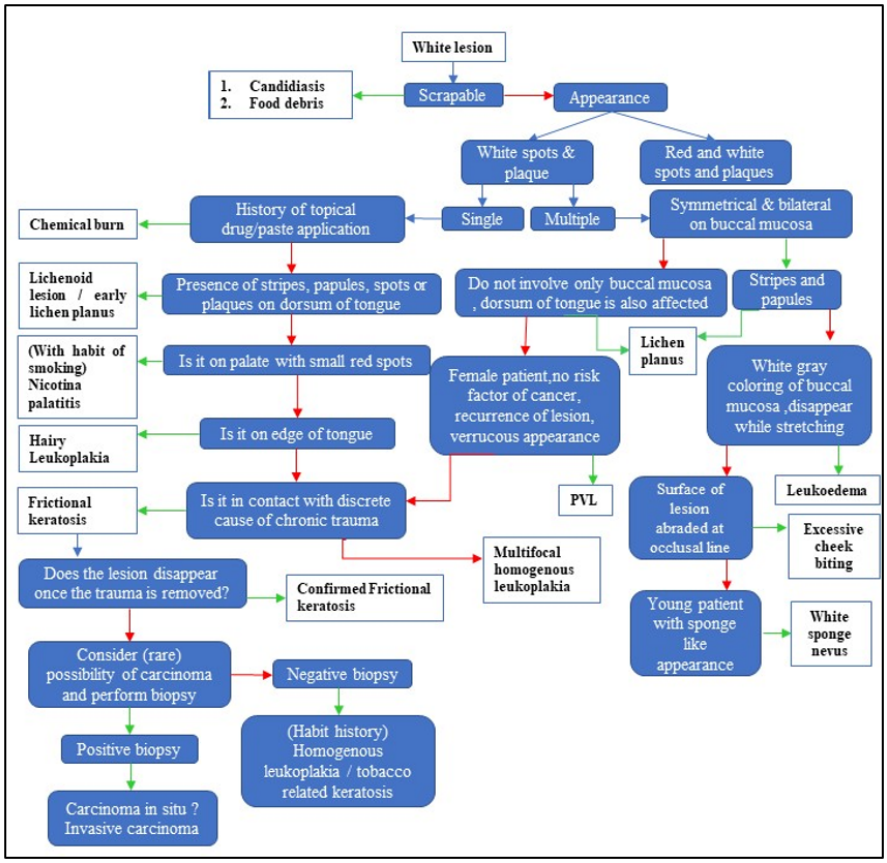

Fig. 1: Diagnostic algorithm for white lesions of oral cavity (Blue arrow – whether Green arrow – Yes Red arrow - No

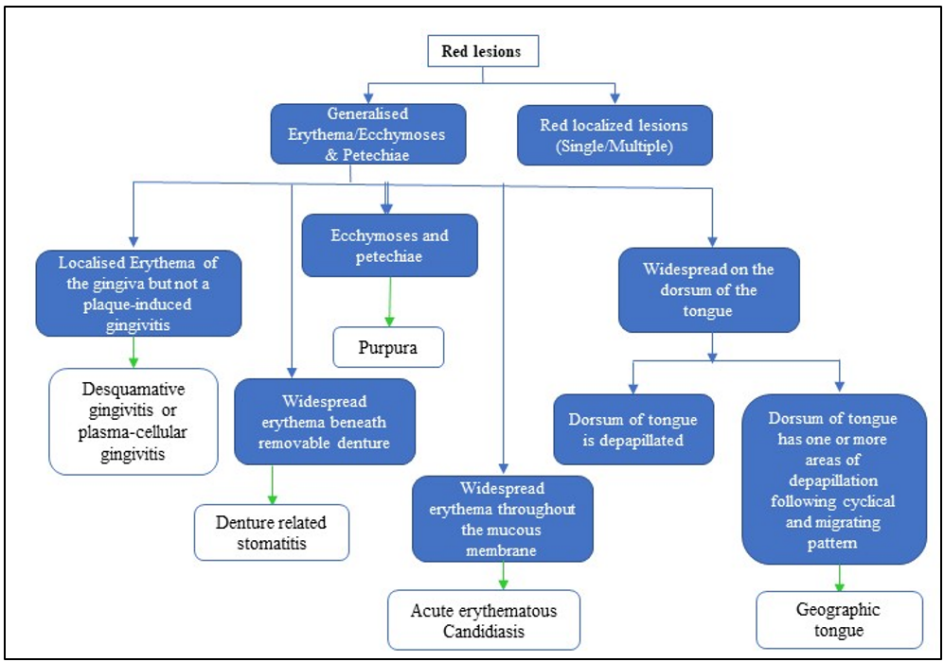

Fig. 2: Diagnostic algorithm for red lesions of oral cavity (Blue arrow – whether Green arrow – Yes Red arrow - No)

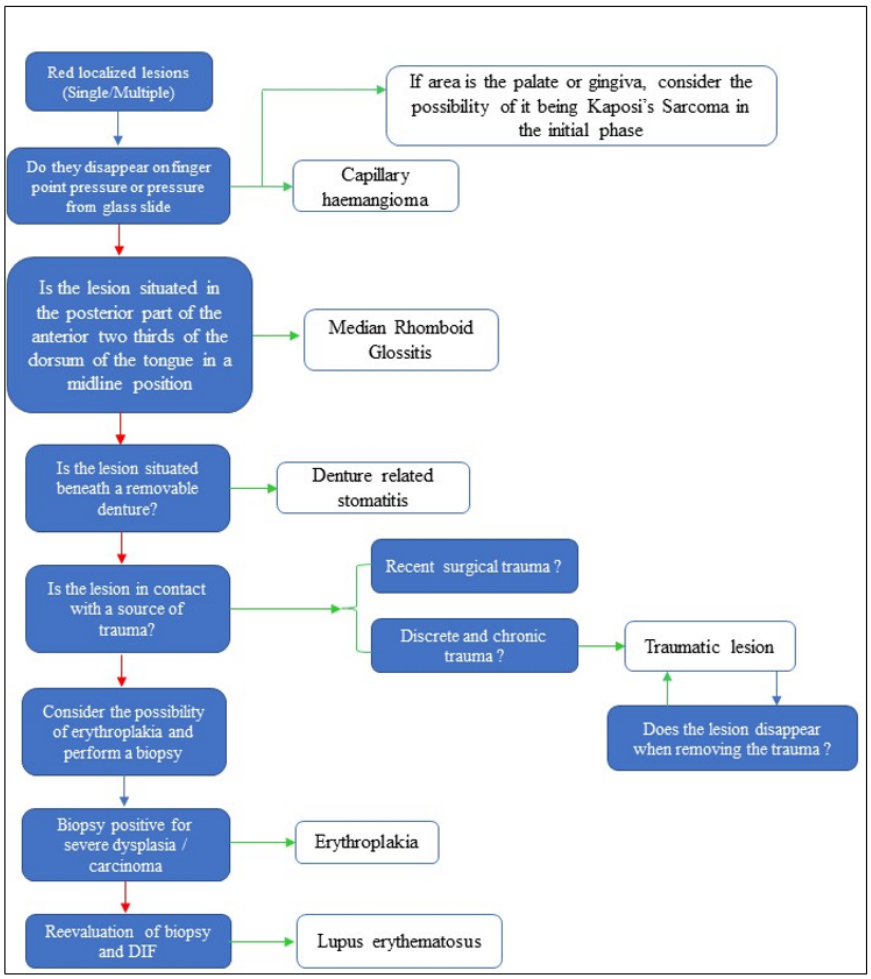

Fig. 3: Diagnostic algorithm for red lesions of oral cavity Blue arrow – whether Green arrow – Yes Red arrow - No

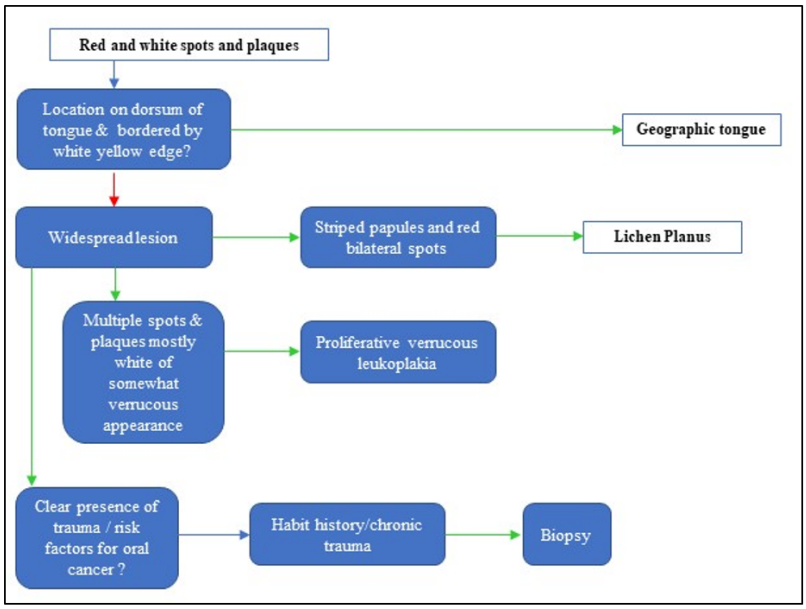

Fig. 4: Diagnostic algorithm for red and white lesions of oral cavity (Blue arrow – whether Green arrow – Yes Red arrow - No)

Table 1: Management of red and white lesions of oral cavity

Red & White Lesions	Management
OPMDs	General recommendation - patient to be placed on review every six months in the first year based on the severity of lesion
Erythroplakia	Early surgical intervention, habit cessation, long term surveillance
Oral Leukoplakia	Risk factor aversion/habit cessation Surgical treatment- cold knife excision, CO2 lasers Combination of excision and laser treatment Antioxidant therapy, Immunomodulating therapy, or any combination
OLP (now considered as autoimmune condition)	Medical - Topical corticosteroids- triamcinolone acetonide & beclomethasone Topical agents- retinoids, cyclosporine, calcineurin Photodynamic therapy
OSMF[11,12]	Pharmacologic therapy Anti-inflammatory/ immunomodulators - corticosteroids mainly, interferon-γ, immunized milk and placental extracts Antioxidants Polyphenols - byproducts of tea pigments; pentoxyphylline; buflomedil hydrochloride; Carotene, vitamin E, and lycopene Surgical therapy Excision and release of fibrotic bands with conventional reconstructive techniques Enzymatic degradation Hyaluronidase, collagenase, chymotrypsin
Reactive lesions	General recommendation – identify and eliminate the cause Patient to be placed on follow up until lesion is regressed completely
Tobacco Pouch Keratosis	It is reversible alteration of oral mucosa – Habit cessation, multivitamins, if required topical retinoids & corticosteroids.
Frictional hyperkeratosis	Removal of irritating factor like sharp cusp or denture, topical retinoids.
Metabolic conditions	
Depapillation of tongue in vitamin deficiencies	Blood tests, symptomatic treatment, Vitamin B complex supplements
Strawberry gingivitis	Blood tests like CBC, Hb, ANA titre, Urine analysis Corticosteroids. If Wegener's granulomatosis – Tapering dose of Prednisolone.[8]
Pallor of oral mucosa	Anemia – CBC, treatment according to anemia diagnosed Iron supplements
Congenital lesions	
Hemangioma	The majority of oral hemangiomas will involute over time and do not require treatment. Medical and surgical therapy is available if these tumors persist into adulthood or interfere with speech, swallowing, or the airway.
Immunological lesions	
Plasma cell gingivitis	Preventing exposure to the causative antigen leads to resolution of the condition. topical application of steroids (0.1% Triamcinolone acetonide, thrice daily for 4 weeks, which was tapered gradually over a period of 2 months) and antihistaminic ,patient should be kept on follow up[9]
Drug allergies	Withdrawal/replacement of drug Corticosteroids
Neoplasms	
Kaposi sarcoma	HAART. Surgery, including local excision or electrodesiccation and curettage. Cryosurgery. Radiation therapy. Chemotherapy using one or more anticancer drugs. Immunotherapy using interferon alfa or interleukin-12. Targeted therapy using imatinib or bevacizumab.[10]

promote healing. Biopsy is not necessary for most vascular erythematous oral lesions, except Kaposi's sarcoma. If vascular lesions are traumatized, surgery or embolization may be needed to control bleeding. Because pyogenic granuloma and peripheral giant cell granuloma can resemble amelanotic melanoma, they require biopsy.[15]

4. Conclusion

The patient is very concerned about the clinical diagnostic and treatment planning procedure in the case of white lesions of the oral cavity since it affects how future follow-up care will be provided. This can take the form of confirmation that the lesion is not cause for concern or follow-up guidance after removing any potential local triggers. In a few instances, a prompt biopsy may be followed by a firm course of treatment. The decision-making skills of the dental diagnostician determine the course to be taken or the approach to be used.

Successful management of white lesions of the oral cavity depends on clinical diagnostic abilities and sound judgements. In the best interests of the patient community, underdiagnosis followed by dismissal of early lesions that seem suspicious or overdiagnosis with aggressive therapeutic options should be avoided. It is thought that having a keen observational eye and using good judgement is crucial for providing patients with the best care.

5. Source of Funding

None.

6. Conflict of Interest

None.

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