



Reactive Lesions of the Oral Cavity: A Comprehensive Review of Classification, Pathogenesis, and Clinical Relevance

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Abstract: Reactive lesions of the oral cavity are a diverse group of benign lesions that arise due to chronic irritation, trauma, infection, or other external stimuli. Despite their generally non-neoplastic nature, they can present as clinically significant conditions that may mimic more serious pathologies, often complicating diagnosis. This review presents an up-to-date classification system for common reactive lesions in the oral cavity, delves into their underlying pathogenesis, and discusses their clinical features, differential diagnosis, and management. Furthermore, it highlights the importance of recognizing these lesions to avoid unnecessary invasive treatments while ensuring proper clinical intervention.

Keywords: Reactive lesions, oral cavity, pyogenic granuloma, traumatic fibroma, peripheral giant cell granuloma, leukoplakia, histopathology.

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1. INTRODUCTION

The oral cavity is susceptible to a variety of reactive lesions, many of which are benign and non-neoplastic in nature. These lesions typically arise as a result of trauma, irritation, or chronic inflammation. Despite their benign nature, they can mimic more aggressive conditions, making clinical diagnosis and management challenging. A thorough understanding of these lesions is crucial to prevent misdiagnosis and ensure proper treatment. This review discusses the classification of common reactive lesions, their underlying pathogenesis, clinical presentations, differential diagnoses, and current management strategies.

2. Classification of Reactive Lesions

Reactive lesions in the oral cavity can be classified based on their clinical, histological, and pathophysiological characteristics. The following classification system is commonly used in clinical practice:

2.1 Inflammatory Lesions

1. Pyogenic Granuloma

Pyogenic granuloma is a highly vascular lesion that typically arises in response to trauma or irritation. It is characterized by rapid growth and a propensity for bleeding, often appearing as a red, ulcerated nodule, usually on the gingiva, but it can occur on any soft tissue in the mouth. Histologically, it consists of a network of capillaries with inflammatory cells such as neutrophils and macrophages. Pyogenic granulomas can also develop during pregnancy due to hormonal changes, often referred to as "pregnancy tumors."

2. Peripheral Giant Cell Granuloma (PGCG)

PGCG is a reactive lesion that often arises due to local irritation or injury to the periodontal ligament or periosteum. It appears as a red or purple mass on the gingiva or alveolar ridge, sometimes associated with bone resorption or tooth displacement. Microscopically, PGCG contains

multinucleated giant cells and a hemorrhagic stroma. The lesion is often treated surgically, with recurrence being common if the underlying irritation is not addressed.

3. Peripheral Ossifying Fibroma (POF)

POF typically arises from the periodontal ligament and is commonly seen in response to chronic irritation. It presents as a firm, pedunculated or sessile nodule on the gingiva, often exhibiting calcification or ossification. Histologically, it features fibrous tissue with areas of calcified or osseous material, such as bone or cementum-like structures.

4. Epulis Fissuratum (Inflammatory Fibrous Hyperplasia)

This lesion is a result of chronic irritation, most commonly caused by poorly fitting dentures. Epulis fissuratum appears as a raised, firm mass within the mucosal folds where the denture flange rests, often showing fibrous tissue with chronic inflammation upon microscopic examination. Removal of the offending denture or dental appliance is crucial in preventing recurrence.

2.2 Hyperplastic Lesions

5. Focal Fibrous Hyperplasia

Focal fibrous hyperplasia results from mechanical irritation or trauma, leading to a proliferation of fibrous tissue in response to the chronic irritation. Clinically, it presents as a firm, well-circumscribed nodule on the buccal mucosa, lips, or gingiva. Histologically, it consists of dense fibrous connective tissue with minimal inflammatory cells. Surgical excision is the treatment of choice, with low recurrence rates.

6. Leukoplakia

Leukoplakia is a clinical term used to describe white, non-removable patches or plaques that arise due to chronic irritation or exposure to carcinogenic substances like tobacco or alcohol. It is considered potentially premalignant, as it may exhibit dysplasia or carcinoma in situ upon histological examination. Histopathological features include epithelial hyperplasia and, in more severe cases, dysplasia or invasive carcinoma.

7. Erythroplakia

Like leukoplakia, erythroplakia is associated with chronic irritation and carries a higher risk of malignant transformation. It presents as a red, velvety lesion, often found on the floor of the mouth or soft palate. Erythroplakia is more likely to show severe epithelial dysplasia or carcinoma upon biopsy and should be managed with caution, often requiring excision and careful follow-up.

8. Lichen Planus

Lichen planus is an autoimmune-mediated disorder characterized by white, lace-like lesions on the oral mucosa. It is believed to result from a T-cell-mediated immune response that leads to basal cell degeneration. The lesions may be asymptomatic or associated with pain, particularly when ulceration occurs. Histologically, lichen planus shows a band-like lymphocytic infiltrate at the epithelium-connective tissue junction, with basal cell degeneration.

2.3 Traumatic Lesions

9. Traumatic Fibroma

Traumatic fibromas are benign lesions that arise from chronic mechanical irritation or trauma, such as from teeth, dental appliances, or biting. These fibrous masses are usually painless, firm, and well-circumscribed, typically found on the buccal mucosa or tongue. Histologically, they consist of dense collagenous tissue with few inflammatory cells, and surgical excision is often curative.

10. Traumatic Ulcer

Traumatic ulcers result from physical injury or trauma to the oral mucosa. They present as painful, round or oval ulcers with a yellowish center surrounded by erythematous borders. Common causes include biting, sharp dental appliances, or accidental injury. Histologically, traumatic ulcers show epithelial ulceration and acute inflammatory infiltrates.

2.4 Vascular Lesions

11. Hemangioma

Hemangiomas are benign vascular tumors that may be congenital or acquired. They can present as red or purple lesions on the tongue, lips, or gingiva, often being soft and compressible. Hemangiomas are composed of dilated blood vessels and can be classified into capillary, cavernous, or mixed types based on the size of the vascular spaces. Treatment options include surgical excision, sclerotherapy, or laser therapy.

12. Lymphangioma

Lymphangiomas are malformations of the lymphatic vessels, often congenital, that present as soft, compressible, and pale swellings, commonly located on the tongue or floor of the mouth. Histologically, lymphangiomas consist of dilated lymphatic vessels filled with lymph. Treatment often involves surgical excision, though recurrence is possible.

3. Pathogenesis of Reactive Lesions

The pathogenesis of reactive lesions is often driven by the body's response to external stimuli, including physical trauma, infection, or chronic

irritation. These stimuli can cause localized inflammation, leading to the proliferation of tissue as part of the healing response. Inflammatory mediators such as cytokines, growth factors, and prostaglandins play a central role in these processes, promoting tissue regeneration and fibrosis. However, persistent irritation or unresolved inflammation can lead to the development of these lesions, which may continue to grow or cause further tissue damage.

4. Clinical Presentation and Diagnosis

Reactive lesions of the oral cavity can be difficult to differentiate from more serious conditions such as oral cancer. Clinically, these lesions are typically slow-growing, well-circumscribed, and asymptomatic, though some, such as pyogenic granulomas or traumatic ulcers, may cause pain or bleeding. Key features that aid in diagnosis include:

- **Size, Location, and Color:** For example, pyogenic granulomas are highly vascular and red, while fibromas are firm and pale.
- **Symptomatology:** Some lesions, such as traumatic ulcers, are painful, while others, like peripheral ossifying fibromas, are often painless.
- **Histopathology:** Biopsy remains the gold standard for diagnosis, with tissue examination revealing characteristic features such as hyperplasia, fibrosis, or inflammatory cell infiltration.

5. Management and Treatment

Management of reactive lesions is typically conservative, focusing on the elimination of the underlying cause (e.g., irritation from dental appliances) and surgical excision of the lesion itself. In many cases, these lesions are self-limiting, and recurrence can be minimized by removing the

irritant. Surgical excision is the treatment of choice for most reactive lesions, with recurrence rates generally low when proper follow-up is maintained. For lesions with a higher risk of malignant transformation, such as leukoplakia or erythroplakia, close monitoring and possible excision are recommended.

5. CONCLUSION

Reactive lesions of the oral cavity are a diverse group of benign conditions that arise as a response to external stimuli such as trauma, infection, or chronic irritation. While they are generally non-neoplastic, their clinical presentation can overlap with more serious conditions, making accurate diagnosis essential. A thorough understanding of the classification, pathogenesis, and clinical presentation of these lesions is critical for effective management. With proper diagnosis and treatment, most reactive lesions can be successfully managed, leading to favorable outcomes for patients.

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