

# Infectious Granulomatous Diseases of the Oral Cavity: A Diagnostic Challenge

Mahayri Aminu\*

Department of Oral Hygiene, Saint Camillus International University of Health Sciences, Via di Sant'Alessandro 8, 00131 Rome, Italy

## Introduction

Infectious granulomatous diseases are a heterogeneous group of diseases characterized by the formation of granulomas, which are localized collections of macrophages, epithelioid cells, and multinucleated giant cells. Granulomatous inflammation can result from various infectious agents, such as bacteria, fungi, and viruses. In the oral cavity, granulomatous diseases present a unique diagnostic challenge due to the multitude of possible underlying causes and their clinical similarities to other oral pathologies. Granulomas are typically a result of chronic inflammation, often as a protective response to persistent infections or foreign materials. While many infectious granulomatous diseases can be relatively rare, they are particularly significant due to the complications they can present in the oral cavity. These diseases may affect oral mucosa, salivary glands, and bones, and can lead to a wide range of symptoms, from mild discomfort to severe and debilitating effects on oral function [1].

Infectious granulomatous diseases in the oral cavity are often overlooked, and their diagnosis can be delayed due to their nonspecific symptoms and the complexity of differential diagnoses. Therefore, understanding the pathophysiology, clinical presentation, and diagnostic methods for these conditions is essential for early detection and appropriate management. This article aims to provide an overview of infectious granulomatous diseases in the oral cavity, discussing their classification, clinical manifestations, diagnostic challenges, and management strategies [2].

## Description

Granulomatous diseases in the oral cavity can arise due to a variety of infectious causes. Some of the most common infectious agents that lead to granulomatous inflammation in the oral cavity include mycobacteria, fungi, and certain bacteria. The conditions discussed below are among those that commonly affect the oral cavity and present as granulomatous diseases. Tuberculosis is one of the most well-known infectious granulomatous diseases caused by *Mycobacterium tuberculosis*. Although TB primarily affects the lungs, it can also involve the oral cavity, particularly in cases of secondary infection or as part of disseminated disease. Oral manifestations of TB are rare but can present as ulcers, swelling, and lesions that often resemble squamous cell carcinoma or other chronic oral infections. In some cases, the infection can lead to the destruction of the oral mucosa and underlying bone. The diagnosis of oral tuberculosis is often challenging because it can mimic other oral diseases. The presence of a persistent, non-healing ulcer, particularly in individuals with a history of pulmonary TB or exposure to the disease, should raise suspicion. A biopsy showing granulomatous inflammation with acid-fast bacilli confirms the diagnosis [3].

**\*Address for Correspondence:** Mahayri Aminu, Department of Oral Hygiene, Saint Camillus International University of Health Sciences, Via di Sant'Alessandro 8, 00131 Rome, Italy; E-mail: mahayriaminu@rn.it

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Leprosy, caused by *Mycobacterium leprae*, is another granulomatous infection that can affect the oral cavity. Although rare in developed countries, leprosy still presents a significant health concern in endemic regions. The disease primarily affects the skin, peripheral nerves, and mucous membranes, including the oral cavity. Granulomatous lesions in the oral mucosa, palate, gingiva, and tongue are common, leading to disfigurement, mucosal ulcers, and loss of sensation. In the oral cavity, leprosy may present as painless ulcers, enlarged salivary glands, or a loss of tissue due to the chronic inflammatory process. Diagnosis is made through skin biopsies, PCR tests, and clinical examination. Fungal infections can also lead to granulomatous disease in the oral cavity. The most common fungi associated with oral granulomas are *Histoplasma capsulatum*, *Coccidioides immitis*, and *Blastomyces dermatitidis*, which cause systemic infections with secondary oral manifestations. Fungal granulomas tend to be more common in immunocompromised individuals, such as those with HIV/AIDS or other conditions that impair immune function. Oral fungal granulomas often present as chronic, painless lesions or ulcers, sometimes with associated swelling. They can affect both the mucosa and the underlying bone, leading to osteomyelitis in some cases. Diagnosis is confirmed through fungal cultures, histopathology, and serological tests [4].

Although not primarily an infectious disease, sarcoidosis can be triggered by infectious agents and is often considered a granulomatous condition. Sarcoidosis is a systemic inflammatory disease characterized by the formation of non-caseating granulomas in multiple organs, including the oral cavity. In the oral cavity, sarcoidosis may manifest as swelling of the salivary glands, gingival enlargement, and oral ulcers. The disease is often diagnosed through exclusion and biopsy, showing non-caseating granulomas in the affected tissues. Caused by *Bartonella henselae*, cat scratch disease is a zoonotic infection that often presents with granulomatous inflammation. While the disease typically presents as regional lymphadenopathy following a scratch or bite from an infected cat, it can also have oral manifestations. Oral lesions may include ulcers, gingivitis, or even granulomas in the soft tissues, though these are rare. Diagnosis is confirmed through serological tests, PCR, or tissue biopsy, with the identification of *Bartonella henselae* or its DNA. Actinomycosis is a chronic bacterial infection caused by *Actinomyces* species, which are part of the normal flora of the mouth. This disease is characterized by the formation of granulomatous lesions that can affect the soft tissues, jawbones, and salivary glands. It typically presents with a slowly enlarging, indurated mass in the oral cavity, often associated with a draining sinus that discharges sulfur granules. Actinomycosis may mimic other conditions, including tumors, abscesses, and tuberculosis, making its diagnosis challenging. Treatment usually involves long-term antibiotics, particularly penicillin, along with surgical drainage when necessary [5].

## Conclusion

Infectious granulomatous diseases of the oral cavity present a unique diagnostic challenge for clinicians. While the conditions themselves may be relatively rare, their ability to mimic other more common oral diseases can make early diagnosis and appropriate management difficult. A thorough clinical evaluation, histopathological examination, and collaboration across specialties are key to achieving accurate diagnoses and improving patient

outcomes. Early detection and treatment are essential in preventing complications, including disfigurement, functional impairments, and systemic involvement. With continued awareness and research, the challenges of diagnosing and treating these conditions in the oral cavity can be better addressed, leading to improved clinical care for affected individual.

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None.

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## Conflict of Interest

None.

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