

## Actinomyces-associated Lesions Located in the Gingiva: Case Report of Rare Gingival Lesions

### Abstract

*Actinomyces* spp. are located without displaying any pathogenic effect in the oral flora. However, the disruption of oral microenvironmental balance, mucosal tissue integrity, and defense system can cause microorganisms to settle on deep periodontal tissues and to induce pathologic reactions. The present case report describes erythematous and desquamative lesions with pseudomembrane limited to the gingiva. In the histopathologic examination, *Actinomyces* colonies were isolated from the gingiva. On the basis of histopathologic and laboratory findings, the lesions were diagnosed as *Actinomyces*-associated lesions of the gingiva. No condition that caused immuno suppression was present in the patient. Nevertheless, local effect of the chlorhexidine mouthwash usage for a period may induce irritation of the oral keratinized tissue. The localized form of actinomycotic lesions occurs seldom in the gingival tissues. In rare cases like this, the practice of differential diagnosis with a multi-disciplinary approach is very important for the accurate diagnosis and appropriate treatment planning.

**Keywords:** *Actinomyces*, actinomycotic lesion, desquamation, gingiva

### Introduction

*Actinomyces* strains are predominant in periodontal tissues both in healthy and inflammatory conditions.<sup>[1]</sup> The bacterium is commonly located in calculus, periodontal pockets, carious lesions, tooth, and oral mucosal surfaces.<sup>[2]</sup> *Actinomyces* spp. are regular components of the oral flora and do not cause any disease as long as they are confined to the surface of the mucosa. However, when mucosal integrity and defense mechanisms are disturbed, they can settle on deep periodontal tissues and may cause pathologic reactions.<sup>[2]</sup> The localized form of *Actinomyces*-associated lesions that are limited to the periodontal tissues is extremely rare.<sup>[3]</sup> The differential diagnosis of these lesions should be considered for accurate diagnosis and treatment planning.<sup>[4]</sup>

### Case Report

A 63-year-old male patient was admitted to the Department of Periodontology with a complaint of bleeding on the gingival tissue. The patients' previous medical history included noninsulin-dependent diabetes mellitus and hyperlipidemia which were treated with drugs for

14 years. The patient had a history of acute myocardial infarction 9 years earlier, and two stents were implemented. He had been using antihypertensive and anticoagulant medications ever since. In the dental anamnesis, it was learned that the patient admitted to the practitioner dentist for a routine examination, 3 months before the admission to our department. Following the dental examination, the use of chlorhexidine-based mouthwash was prescribed (0.12%, 200 mL). The patient had used 3 bottles of the mouthwash in the last 2.5 months, and later, dental scaling treatment was carried out. In the last regular examination of the patient, the general practitioner dentist observed desquamation in gingival tissue and directed the patient to the Periodontology Department. The patient reported to our department in 1 week. On intraoral examination, the erythematous appearance of gingival tissue, desquamation with pseudomembrane and bleeding on anterior and posterior vestibular/palatal aspects of the maxillary gingiva were observed [Figure 1]. There was no pain or burning sensation complaints. Any pathologic/inflammatory change was not observed in the rest of the oral soft tissues. It was also noted that some teeth were

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missing, and except for tooth numbered 17, full-mouth metal supported porcelain restoration was applied. The teeth were removed due to tooth decay, and the prostheses were applied 14 years ago. In some areas, the prostheses did not have good marginal adaptation, and retentive areas were formed. Accumulation of plaque was observed in the areas lacking good marginal adaptation of the prostheses. Although any pathological finding was not observed in the trabecular structure of alveolar bone, localized and slight alveolar bone resorption was determined on radiographic examination.

Before the biopsy, the case has been consulted to the Department of Dermatology. Incisional biopsy was taken from the right maxillary premolar-molar vestibular area including marginal and attached gingiva under local anesthesia. The obtained specimen was sent for a histopathological examination with a provisional diagnosis of pemphigus vulgaris or erosive liken planus. On the histological assessment of the specimen with H&E stain, subepithelial separation and inflammatory granulation tissue were identified. Furthermore, positive *Actinomyces* colonies and sulfur granules were defined in histochemical examinations which were performed in the separated subepithelial area with hematoxylin-eosine and periodic acid-Schiff strains [Figure 2]. Although *Actinomyces* was demonstrated in the histopathologic examination; tissue cultures did not yield *Actinomyces* spp. Direct immune fluorescent examinations did not show IgG, IgM, IgA, and C3 accumulations. Furthermore, desmoglein I and III were found to be negative which ruled out the possibility of pemphigus. Routine laboratory blood analyses were within normal limits.

On the basis of histopathologic findings, the lesions were diagnosed as *Actinomyces*-associated lesions of the gingiva. The patient was referred to the Department of Infectious Diseases. In the light of these outcomes, a treatment planning was made by the Department of Infectious Diseases which prescribed ampicillin (1 g) application for 40 days through intravenous, followed by 1-month oral use of the same dosage ampicillin. Following the treatment, the patient's complaints and all the symptoms related with gingival tissues were resolved totally [Figure 3]. The case has been followed up over 3 years and has remained asymptomatic.

## Discussion

Even though *Actinomyces* is a regular major component of the oral flora, localized *Actinomyces*-associated lesions at oral mucosa or gingiva are extremely rare.<sup>[3]</sup> The bacteria while not causing any pathology on the surface of the mucosal tissue, in cases where the integrity of the tissue is destructed may cause infection. Actinomycotic lesions usually occur following a dental infection or oromaxillofacial trauma.<sup>[4]</sup> The patient did not have any recent history of tooth extraction or mechanical trauma. However, he had slight alveolar bone resorption

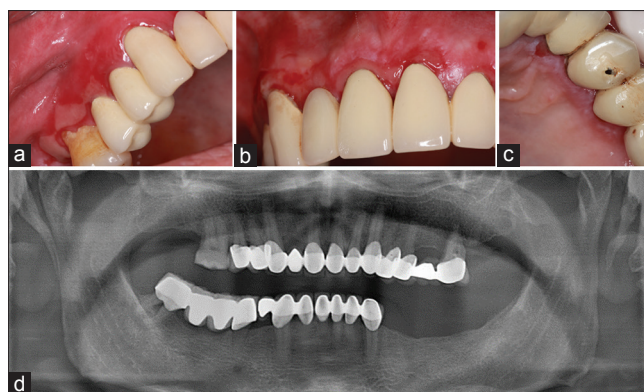


Figure 1: (a-c) Initial clinical views of *Actinomyces*-associated lesions from buccal and palatal aspects. The erythematous and desquamative appearances of gingival tissue are seen. (d) The panoramic image of the patient shows slight alveolar bone resorption

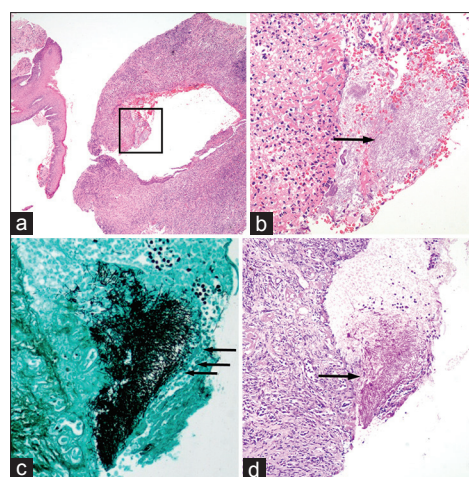


Figure 2: Histopathologic examinations show exudate and active chronic inflammation with hematoxylin-eosine stain, (a)  $\times 40$  and (b)  $\times 200$ . The arrows indicate *Actinomyces* colonies and sulfur granules with histochemical examinations in (c) Gomori's methenamine silver,  $\times 200$  and (d) periodic acid-Schiff,  $\times 200$

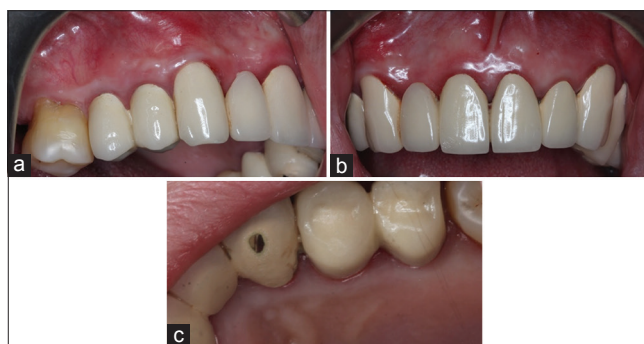


Figure 3: (a-c) The appearance of gingival tissues after the treatment of *Actinomyces*-associated lesions

and attachment loss which were the symptoms of chronic periodontitis. The fact that he used 3 bottles of chlorhexidine-based mouthwash for 2.5 months might have affected the integrity of the tissue and compromised the defense mechanism. As a result, *Actinomyces* has seeded deep in the gingival tissue and led to disease.

Chlorhexidine (CHX) is a commonly used antimicrobial which has antiplaque and antigingivitis effects.<sup>[5]</sup> Even though CHX has broad antimicrobial effects, commercially available concentrations (%0.12) of CHX decrease the production of collagen and noncollagen proteins and exhibit cytotoxic effects on gingival fibroblasts by decreasing the proliferation of the fibroblasts.<sup>[6]</sup> The bacteria that initially colonize the oral tissues, *Streptococcus* and *Actinomyces*, are susceptible to CHX.<sup>[7]</sup> However, many clinical researches demonstrate that following CHX treatment, after the initial suppression of flora, rapid recolonization occurs.<sup>[5]</sup> In our case, rapid recolonization of *Actinomyces* in the deep layers of tissue which is under the CHX's cytotoxic effect may be present. Besides, while CHX has a long-term suppressive effect on *Streptococcus*, its effect on *Actinomyces* is limited.<sup>[8]</sup> It has been reported that following the application of CHX, colonization of *Actinomyces* with higher numbers and intensity is observed.<sup>[9]</sup> CHX alters the oral microenvironment's balance such as the suppression of *Streptococcus* that may cause an increase in *Actinomyces* colonization. As in the same medium, *Actinomyces* is suppressed by the low environmental pH caused by the inhibitory substances such as H<sub>2</sub>O<sub>2</sub>, bacteriocins, and organic acids that are produced by streptococci.<sup>[7]</sup>

It is stated that poor oral hygiene and periodontitis can ease the penetration of bacteria into the oral tissue.<sup>[2]</sup> Rüdiger et al. claim that *Actinomyces* spp. are found mainly in exposed root surfaces.<sup>[10]</sup> In the present case, oral hygiene of the patient was insufficient, and there were exposed root surfaces due to chronic periodontitis which we believe that paved the way for the formation of actinomycotic lesions.

In the present case, the erythematous appearance and the desquamated feature of the lesions required us to make a differential diagnosis for candida and some mucocutaneous diseases. Through the histopathologic assessment and the tissue culture examination for candida, the possibility of any other disease with similar clinical characteristics has been eliminated. The certain diagnosis of *Actinomyces* infection is commonly made with histopathological examination of biopsy specimens.<sup>[11]</sup> In our case, even though *Actinomyces* colonies are visible in the histopathological examination, in the tissue culture, *Actinomyces* did not reproduce. The tissue culture examination is valuable for diagnosis of *Actinomyces*-associated lesions, but the presence of pathogens may not be displayed microbiologically in all cases.<sup>[12]</sup> The culture-based diagnosis methods of *Actinomyces* have some difficulties due to the fact that *Actinomyces* is mostly contaminated with the oral flora.<sup>[13]</sup> Through the histopathologic assessment and laboratory analyses, the possibility of any other disease with similar clinical characteristics has been eliminated.

## Conclusion

Our case report shows that *Actinomyces*-associated lesions can display clinical appearance similar to that of mucocutaneous or candida diseases. The present case report demonstrates the importance of the practice of differential diagnosis with a multidisciplinary approach for the accurate diagnosis and treatment planning. Furthermore, the detailed systemic and dental history of the patient is helpful in the management of the disease.

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## Conflicts of interest

There are no conflicts of interest.

## References

1. Socransky SS, Haffajee AD. Dental biofilms: Difficult therapeutic targets. *Periodontol* 2000 2002;28:12-55.
2. Kaplan I, Anavi K, Anavi Y, Calderon S, Schwartz-Arad D. The clinical spectrum of *Actinomyces*-associated lesions of the oral mucosa and jawbones: Correlations with histomorphometric analysis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2009;108:738-46.
3. Sakallioglu U, Açikgöz G, Kirtiloglu T, Karagöz F. Rare lesions of the oral cavity: Case report of an actinomycotic lesion limited to the gingiva. *J Oral Sci* 2003;45:39-42.
4. Finley AM, Beeson MS. Actinomycosis osteomyelitis of the mandible. *Am J Emerg Med* 2010;28:118.e1-4.
5. Matthijs S, Adriaens PA. Chlorhexidine varnishes: A review. *J Clin Periodontol* 2002;29:1-8.
6. Mariotti AJ, Rumpf DA. Chlorhexidine-induced changes to human gingival fibroblast collagen and non-collagen protein production. *J Periodontol* 1999;70:1443-8.
7. Larsen T, Stoltze K, Fiehn NE. Susceptibility of biofilms of *Streptococcus sanguis* and *Actinomyces naeslundii* to chlorhexidine. *Biofilm* 1997;2:1.
8. Beyth N, Redlich M, Harari D, Friedman M, Steinberg D. Effect of sustained-release chlorhexidine varnish on *Streptococcus mutans* and *Actinomyces viscosus* in orthodontic patients. *Am J Orthod Dentofacial Orthop* 2003;123:345-8.
9. Schaecken MJ. Dissertations 25 years after date 21. Enhancing resistance to bacteria with chlorhexidine varnish and probiotics. *Ned Tijdschr Tandheelkd* 2010;117:97-101.
10. Rüdiger SG, Dahlén G, Carlén A. Protein and bacteria binding to exposed root surfaces and the adjacent enamel surfaces *in vivo*. *Swed Dent J* 2015;39:11-22.
11. Hall V. *Actinomyces* – Gathering evidence of human colonization and infection. *Anaerobe* 2008;14:1-7.
12. Pant R, Marshall TL, Crosher RF. Facial actinomycosis mimicking a desmoid tumour: Case report. *Br J Oral Maxillofac Surg* 2008;46:391-3.
13. Alamillos-Granados FJ, Dean-Ferrer A, García-López A, López-Rubio F. Actinomycotic ulcer of the oral mucosa: An unusual presentation of oral actinomycosis. *Br J Oral Maxillofac Surg* 2000;38:121-3.