Localized actinomycosis at gingiva

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ABSTRACT

Introduction: Gingival actinomycosis is a rare disease caused by Actinomyces israelii in the oral cavity.

Case Report: A 42-year-old healthy man without underlying diseases or any teeth troubles suffered from severe pain in the gingival of the right mandibular bone for three weeks. The intraoral inspection revealed a well-defined elastic hard mass with a size less than 10 mm on the medial side of the right mandibular gingiva. The histopathological examination proved that the bacterial druse with radial structure invaded the bone margin widely and proliferated in some places of the bone. After removing the mass and scraping off the around bone, followed by two month-oral use of Amoxicillin (AMPC:1500 mg/day), his complaints and the gingival tissue have been entirely resolved.

Conclusion: The morphological features of the growth of actinomyces in the bone margin by the limited lesion of actinomycosis at the gingiva have not ever been reported. Even localized actinomycosis at gingiva should be adequately treated.

Keywords: Actinomycosis, Amoxicillin, Druse, Gingiva

INTRODUCTION

Gingival actinomycosis is a rare disease caused by Actinomyces israelii. Typical actinomyces infections are chronic and result in multiple abscesses in soft tissues and other organs [1]. The most common sources of infection in the facial bone are dental caries, maxillofacial trauma, and dental procedures [2, 3]. Actinomycosis usually involves on the oral membrane of the tongue and the alveolar mucosa; however, it is relatively rare in the gingiva. Furthermore, actinomycetes themselves are indigenous bacteria in the oral flora and actinomycetes are present in the periodontal disease even in healthy adults. However, it never causes pathological reactions only by being present on the mucosal surface, and it possibly progresses deeply and causes pathological disease in immunocompromised cases or older adults [1]. The limited lesions of actinomycosis at oral mucosa or gingiva have not ever reported to cause severe pain in healthy subjects. We report here a rare case suffering from severe pain by a limited lesion of gingival actinomycosis with unusual pathological findings.

CASE REPORT

A 42-year-old healthy man noticed a mass in the medial gingiva of the right mandible with the approximate onset of three weeks. He was referred to our clinic since...
the mass gradually increased accompanying severe pain, although he did not have fever or trismus. No history of contracting an obvious infection was observed, and no other upper respiratory tract showed any inflammatory findings.

Intraoral inspection revealed a well-defined elastic hard and bulky mass with the size of approximately 10 mm on the medial gingiva of the right mandibular bone. The covering mucosa presented mild redness without palpititation or swelling (Figure 1A). There were no caries and cavities in the molars adjacent to the lesion. For this case, a minor salivary gland neoplasm was first suspected. However, an observation of the microvascular architecture for differential diagnosis using narrow-band imaging (NBI) nasopharyngeal fibroscope did not prove angiogenesis being critical to the transition of premalignant lesions [4] (Figure 1B). The tumor resection was performed under local anesthesia followed by scrapping off the around bone surface.

Interestingly, histopathological examination revealed numerous bacterial druse with radial structure growing along the bone margin widely. The growth appeared like bacterial mycelium was budding from the inside of bone to the outside of surrounding space. The mass deeply proliferated in some place of the bone. Basically, an association of neutrophilic leukocytes was present with the proliferated bacterial mass (Figure 2). Other inflammatory cell infiltration was present in the connective tissues of the circumference. Furthermore, inflammatory hyperplasia of the squamous epithelium was observed. The druse was positive for Periodic acid–Schiff stain (PAS) and Grocott’s staining (Figures 3 and 4) and negative for Thiel–Nersen staining, which resulted in diagnosing actinomycosis, although cell culture investigation was not performed.

We diagnosed actinomycosis at the gingiva on the basis of histopathologic findings. Empirically, oral administration of amoxicillin (AMPC, 1500 mg/day) was selected and used for two months, which has relieved his complaints and resolved the gingival tissue entirely.

The postoperative computed tomography (CT) showed neither recurrence nor bone destruction (Figure 5). Up to date, the excised site has been repaired with a covered normal mucosal epithelium, and no relapse has been observed for one year after the operation.

Figure 1: Intraoral findings of the gingival actinomycosis. (A) White light image, and (B) narrow-band imaging by nasopharyngeal fibroscope. White arrow heads show the mass at the gingiva.

Figure 2: Pathological finding: HE stain, Bacterial mass (druse) with radial structure invaded the bone margin widely (white arrow head). The mass is associated with neutrophil leukocytes (white arrow).

Figure 3: Pathological finding: PAS stain. The druse was positive for PAS stain.

DISCUSSION

Actinomycetes are resident in the caries cavities and plaques and often grow through the damaged tissue due to purulent inflammation in the oral cavity, tooth extraction, or oromaxillofacial trauma. Like the present case, it is extremely rare to develop actinomycosis presenting the limited lesion at the gingiva in a healthy adult without underlying diseases or any teeth troubles [5].

The oral lesions of the actinomycosis are usually regarded as one of the non-specific observations.
Clinical diagnosis by the nasopharyngeal fiberscope is very difficult because the actinomycosis presents non-specific findings. Thus, it is often difficult to distinguish them from non-specific chronic infections or specific chronic infections like tuberculosis [6, 7]. We could not perform a laboratory culturing in our case. However, the Actinomyces are rarely detected by culture tests because the Actinomyces species are mostly anaerobic and are often contaminated with the oral flora. The histopathological findings may be the most reliable technique for differential diagnosis.

It is also known that pathogenic actinomyces to humans are divided into two types, anaerobic and aerobic. The former is actinomyces-induced actinomycosis, and the latter is Nocardia, which causes nocardiosis. The most common sites of Nocardia are the skin, brain, and lungs, and the histology does not have the characteristic structure found in actinomycosis. The bacterial mass also presents a doughnut shape [8]. The morphological pathological changes observed in our case showed no characteristic feature of Nocardia.

Actinomycosis in the oral and maxillofacial regions is classified into soft tissue and bone types. The bone type is also divided into the periostitis and osteomyelitis types. In general, osteomyelitis type is known to be rare. The bone resorption in the periostitis type is usually tiny, but the margin of the bone resorption is unclear [3]. The soft tissue type is overwhelmingly predominant; however, the case with a complain of severe pain in the limited lesion of actinomycosis at gingiva is extremely rare. The present case provided unique pathological findings that the druse with radial structure invaded the bone margin widely and proliferated into the bone deeply in some places [9]. The morphological features of the growth of actinomyces in the outer surface of bone margin have not yet been described so far as we know. The unusual pathological findings suggest that the invasion of the actinomycosis to periostitis and bone surface induces the severe pain even in the limited lesion at gingiva. The postoperative CT never showed apparent bone erosion by the actinomycosis at the gingiva; however, it is required to remove the mass and scrape off the around bone surface carefully because the surgical procedure immediately relieved the severe pain in our case.

Low concentration of antibiotics inhibited the growth of *Actinomyces israelii*; however, a high concentration was not bactericidal over one week. In contrast, exposure for 2–6 weeks at a dose equivalent to clinical serum levels of the antibiotics was lethal [10]. There have been no signs of relapse for the present case, and the entire covered mucosa has become epithelialized after oral AMPC for two months. Accordingly, it can be said that there is no established treatment policy regarding the content and duration of medication for actinomycosis, and long-term follow-up is considered necessary.

**CONCLUSION**

Actinomycetes never cause pathological reactions only by being present on the mucosal surface. The limited lesions of actinomycosis at oral mucosa or gingiva are extremely rare. Our case showed that the histopathological examination revealed numerous bacterial druse with radial structure growing along the bone margin widely. After removing the mass and scraping off the around bone, followed by two month-oral use of Amoxicillin (AMPC:1500 mg/day) empirically, his complaints and the gingival tissue have been entirely resolved for one year after the operation. However, we should carefully treat even localized actinomycosis at gingiva.
REFERENCES


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Author Contributions

Mitsuhiro Aoki – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Hiroshi Okuda – Acquisition of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Guarantor of Submission

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We obtained the informed consent from the patient by writing.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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