

CLINICAL IMAGE

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Actinomycosis of the jaw following tooth extraction

Takeshi Onda, Kamichika Hayashi, Akira Katakura

CASE REPORT

An 18-year-old woman with an impacted right third molar extracted two weeks prior experienced persistent pain, indurated swelling of the right cheek, and trismus (Figure 1A). The wisdom tooth was bony and completely horizontally embedded, and was extracted by splitting the tooth after the gingival mucoperiosteal valve was formed and the cortical bone was scraped away and removed. She could open her mouth to only one finger-width. Her leukocyte and C-reactive protein counts were 6900/ μ L (72% neutrophils) and 1.1 mg/dL, respectively. Infection and abscess in the right cheek were identified. After puncture aspiration of the swollen area under local anesthesia and confirmation of the presence of pus, a very small incision was made outside the oral cavity to drain the pus. A granular bacterial mass was detected, and actinomycosis was suspected (Figure 1B). The bacterial mass was pathologically examined and histopathologically diagnosed as actinomycosis (Figure 1C). Intravenous ampicillin (2 g/day) was administered for five days, followed by oral amoxicillin (750 mg/day) for 60 days. Antimicrobial chemotherapy was terminated after the patient experienced relief from buccal swelling, less pain, and an increase in the amount of mouth opening. Since then, the patient has been doing well with no recurrence of symptoms.

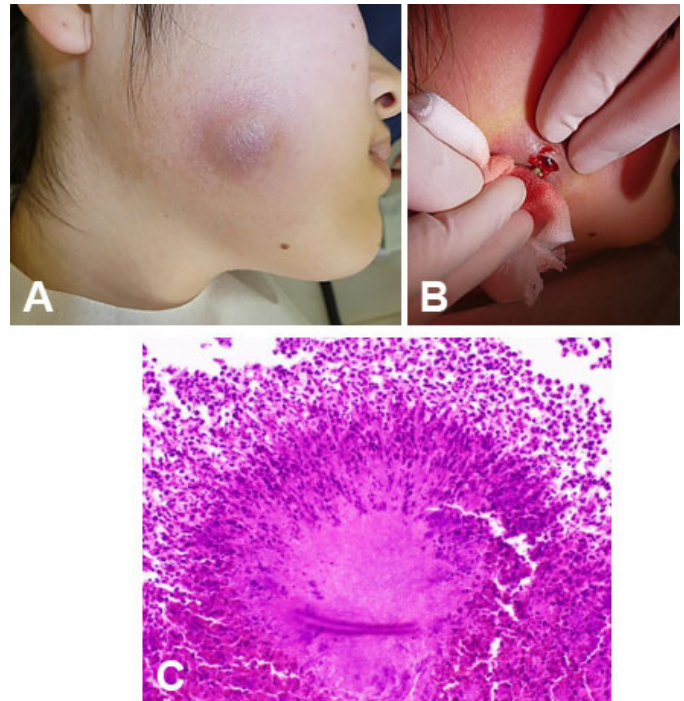


Figure 1: (A) Extraoral findings two weeks after extraction of an impacted right mandibular third molar. Swelling and erythema of the right cheek are observed. (B) Incision and drainage of the abscess via an extraoral approach. A bacterial mass (druse) was detected in the drained pus. (C) Histopathological image of the bacterial mass. A radial arrangement of cudgel bodies is observed around the actinomycetes colony (H-E staining, magnification 400 $\times$).

DISCUSSION

Actinomycetes are indigenous to the oral cavity. Actinomycosis is usually attributed to *Actinomyces israelii* (*A. israelii*) [1]. Characteristic symptoms include indurated swelling, trismus, multiple abscesses, and bacterial masses (druses) [2]. For a definitive diagnosis, it is necessary to confirm the presence of *A. israelii* or a mass of actinomycetes. However, with the advent of modern antibiotics, the number of typical cases has decreased, and some cases are challenging to diagnose due to the absence of characteristic inflammation [3]. Actinomycosis often occurs after tooth extraction, jaw surgery, chronic infection, or as a result of poor oral hygiene. It can also be an opportunistic infection in immunocompromised patients with malignancies, human

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immunodeficiency virus, diabetes, steroid use, or alcohol dependence [4]. The treatment involves incision and drainage using an intraoral or extraoral approach, with long-term administration of antibiotics. Actinomycosis is highly sensitive to long-term penicillin-based antibiotics [2, 5]. This case was initially considered to be a simple post-extraction infection. However, actinomycosis was suspected on detecting a druse intraoperatively. The final diagnosis of actinomycosis of the jaw was made on histopathologic examination of the druse. A good prognosis was obtained after long-term administration of antibiotics.

CONCLUSION

Usually, post-extraction infections are readily resolved through local cleaning and the administration of short-term antibiotics. However, actinomycosis does not respond well to short-term antibiotic use and long-term antibiotic therapy is needed. The detection of druses in the pus is a characteristic finding of actinomycosis.

Keywords: *Actinomyces israelii*, Actinomycosis, Bacterial mass, Druse

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Author Contributions

Takeshi Onda – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, 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

Kamichika Hayashi – Analysis of data, Interpretation of data, Drafting the work, 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

Akira Katakura – Analysis of data, Interpretation of data, Drafting the work, 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

Guarantor of Submission

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Consent Statement

Written informed consent was obtained from the patient for publication of this article.

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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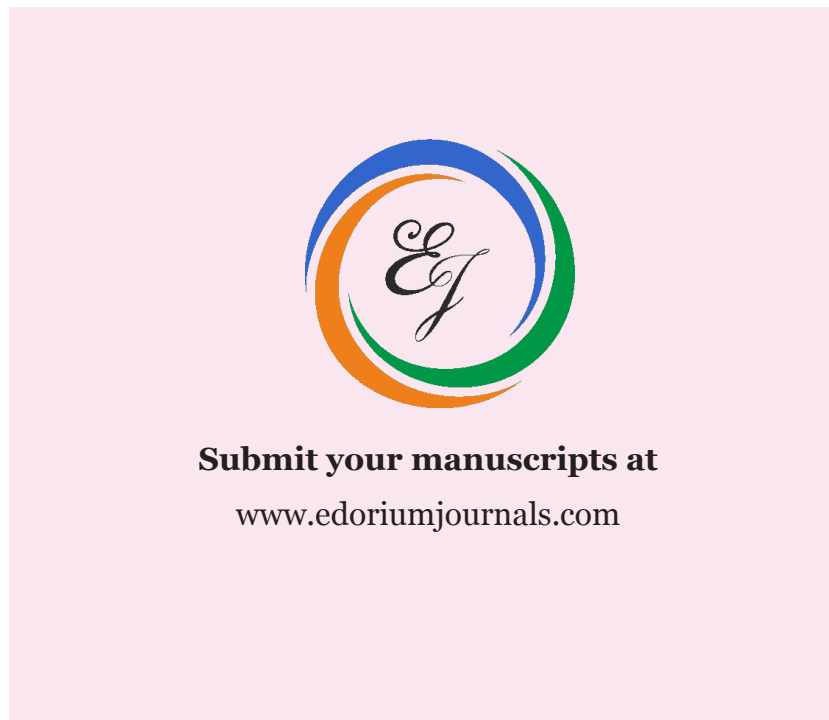
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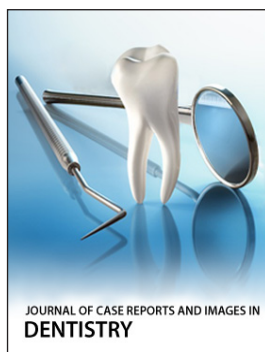
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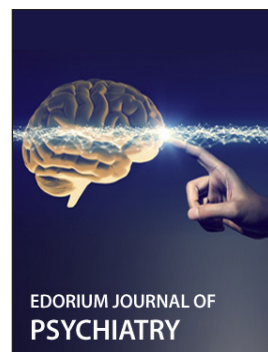
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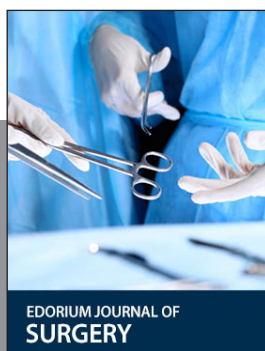
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