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CASE REPORT

Management of an Unresponsive Periodontal Lesion in an Endodontic Involved Tooth Complicated by *Actinomyces* Species

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ABSTRACT

Actinomycosis is an infectious disease caused by *Actinomyces* species found as a commensal in oral flora. However, it does cause opportunistic infections with localized granulomatous and suppurative lesions intraorally once the integrity of the oral mucosal barrier is compromized and access to the underlying tissues or jaw bones is gained. The present case report highlights an unresponsive periodontal lesion associated with an actinomycotic infection in an endodontically involved tooth. The gingiva in relation to the tooth showed profuse spontaneous bleeding and suppurative discharge after multiple appointments of initial therapy which required histopathologic and microbiological assessment for diagnosis. On establishing the diagnosis of actinomycosis, treatment involved extraction of the tooth. This highlights the importance of microbiological investigations in unresponsive periodontal lesions.

Keywords: Actinomycosis, Cervicofacial, Gingiva.

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INTRODUCTION

Actinomycosis is an infectious disease caused by the saprophytic *Actinomyces* species.[1,2] *Actinomyces* are anaerobic, Gram-positive and filamentous bacteria despite their fungal characteristics.[3] Actinomycosis occurs more frequently in cattle as a disease called 'lumpy jaw'.[4] In humans four clinical forms of actinomycosis are seen: the cervicofacial, thoracic, abdominopelvic and cerebral.[5] Cervicofacial actinomycosis is the most common type seen (50-60% of the cases).[6] It often presents as a slowly progressive, indolent, indurated infiltration with multiple abscesses and draining sinuses showing presence of sulphur granules.[7]

They are found as a commensal in the oral cavity often residing in calculus, periodontal pockets, carious lesions and oral mucosal surfaces.[5] However, it does cause opportunistic infections with localized granulomatous and suppurative lesions intraorally once the integrity of the oral mucosal barrier is compromized and access to the underlying tissues is gained due to poor oral hygiene, endodontic/periodontal lesions and trauma.[6] Other predisposing factors include: cancer, immunodeficiencies, such as HIV, long-term steroid therapy, diabetes and malnutrition.[8]

The present case report highlights management of an unresponsive periodontal lesion in an endodontically involved tooth associated with *Actinomyces* infection.

CASE REPORT

A 45-year-old male patient reported to department of periodontics, with chief complaint of bleeding from upper left posterior region of jaw since past 2 weeks. Patient was asymptomatic 2 weeks back after which he noticed spontaneous bleeding from gums which had a sudden onset and progressively increased over a period of time. Bleeding was not associated with any trauma and pain and was aggravated on eating hot foodstuffs and during sleep and was relieved on its own.

The clinical examination revealed, gingiva in relation to 26 was enlarged, soft and edematous in consistency, reddish pink in color with loss of scalloping and stippling. There was presence of 10 mm periodontal pocket on distobuccal aspect of the tooth. The tooth was grade I mobile and had grade II furcation involvement (Fig. 1). Patient had a poor oral hygiene with presence of supra gingival and subgingival calculus. Patient was systemically healthy and reported no relevant past dental history and medical history and all this blood investigations were normal.

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The intraoral periapical radiograph with 26 (Fig. 2) revealed, periapical radiolucency involving the distobuccal root, with interradicular bone loss and angular bone loss on distal aspect of the tooth. The radiographic findings suggested combined periodontic-endodontal lesion, with primary periodontal and secondary endodontic involvement.

Based on the clinical and radiographic findings, the symptomatic therapy consisted of thorough full-mouth scaling and root planing and curettage of the inner pocket lining of 26 under local anesthesia. The procedure was performed using a combination of hand and ultrasonic instrumentation. The patient received oral hygiene instructions with prescription of amoxicillin 500 mg TDS for 3 days, chlorhexidine (0.2%) mouthrinse for 2 weeks. One week follow-up showed uneventful healing (Fig. 3). Patient was advised root canal treatment with 26 followed by periodontal flap surgery.

Patient failed to report for endodontic treatment and visited 2 weeks later, with complain of recurrence of spontaneous bleeding from the same site. Clinical examination revealed similar findings with presence of blood clot and swelling with respect to 26 (Fig. 4). The edematous soft tissue was curettaged and was sent for histopathological investigation. Patient was prescribed amoxicillin and clavulinic acid 625 mg twice daily for 5 days. The site showed uneventful healing after 1 week (Fig. 5).

The histopathological investigation comprized of hematoxylin and eosin (H & E) staining (Figs 6A and B) and special staining using periodic acid schiff (PAS) stain (Figs 7A and B) and Grocott-Gomori methenamine-silver nitrate (GMS) (Figs 8A and B).

The H&E stained soft-tissue specimen showed a chronic abscess with polymorphs, surrounding granulation tissue, fibrosis and basophilic bacterial colonies. The bacterial colonies were tangled together in a matted colony forming a granule (sulphur granule). The bacilli were filamentous, hematoxyphilic and Gram-positive. The peripheral filaments terminated in a club.

Periodic acid schiff soft-tissue specimen showed strong positivity for bacterial colonies showing magenta pink color at the center of the bacterial colony.

Grocott-Gomeri methenemine-silvernitrate stained soft-tissue section showed darkly stained black central core area and peripheral radiating filaments. Normal connective tissue stained green in color.

Histopathological diagnosis was confirmative of *Actinomyces* infection.

However, there was irregularity in follow-up visits shown by the patient. After 2 months, patient was hospitalized for bleeding episode from the same site. Bleeding

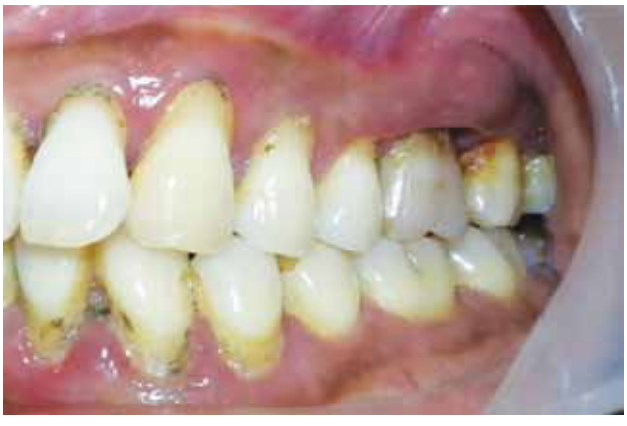


Fig. 1: Preoperative clinical view

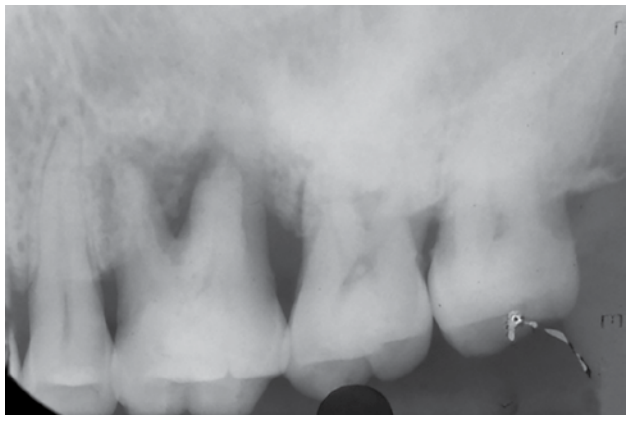


Fig. 2: IOPA with 26

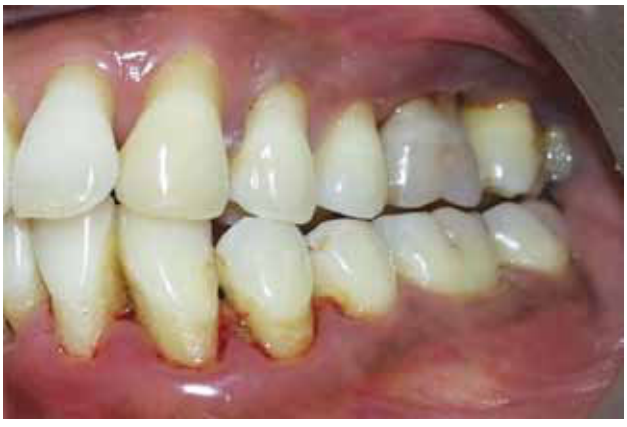


Fig. 3: Clinical view 1 week following scaling and curettage

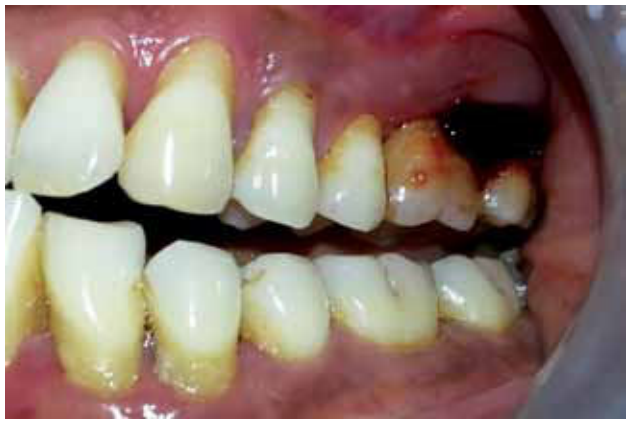


Fig. 4: Recurrence of the swelling after 2 weeks

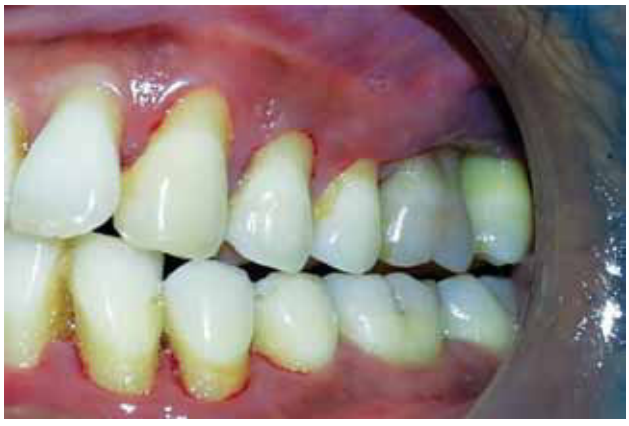


Fig. 5: Clinical view 1 week after retreatment

was controlled using styptics and blood coagulants. The recurrence of the lesion caused a psychological trauma to the patient. Also the patient had a history of failure to comply with regular dental visits/follow-ups. Based on these parameters, it was decided to extract the involved tooth.

Extraction of 26 was carried out under local anesthesia. A buccal mucoperiosteal flap was raised. Extraction was associated with profuse bleeding and an oro-antral communication (Fig. 9). The periapical tissue was completely curetted and was sent for histopathological investigation. Absorbable gelatin sponge (Gel foam®) was placed to arrest bleeding and stabilize the clot. Buccal flap was advanced using Rehrmann's flap design for closure of oro-antral communication. Patient was prescribed injection augmentin 1.2 gm IV TDS, injection metronidazole 100 ml IV TDS and otrivin nasal drops. Patient was advised not to cough or sneeze vigorously. Patient was discharged on the following day and was recalled after 10 days for follow-up and suture removal.

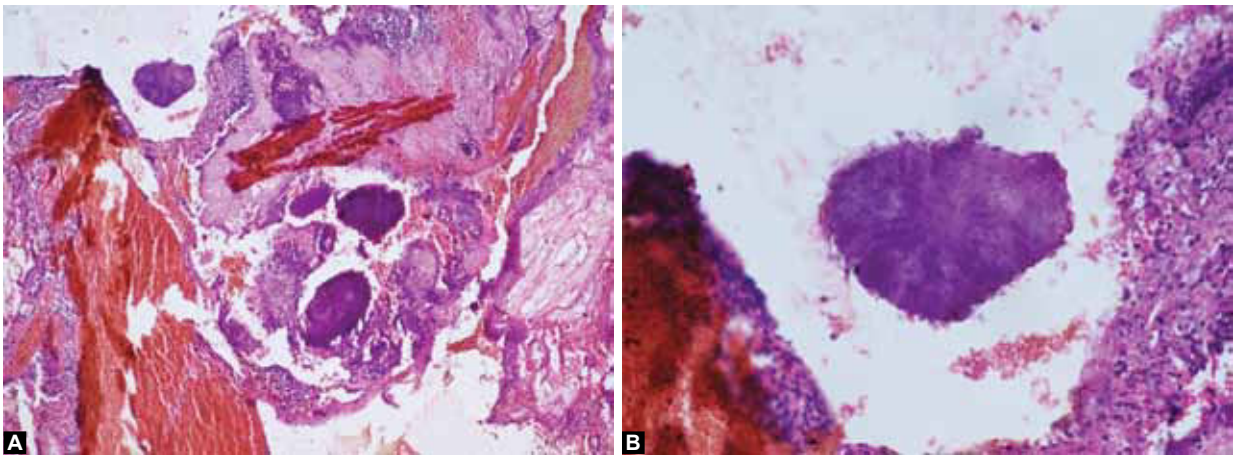
After 10 days, sutures were removed and uneventful healing was observed (Fig. 10).

Hematoxylin and easin staining of the curetted periapical tissue showed filamentous, hematoxyphilic and Gram-positive bacilli confirming the previous diagnosis of *Actinomyces* infection (Fig. 11).

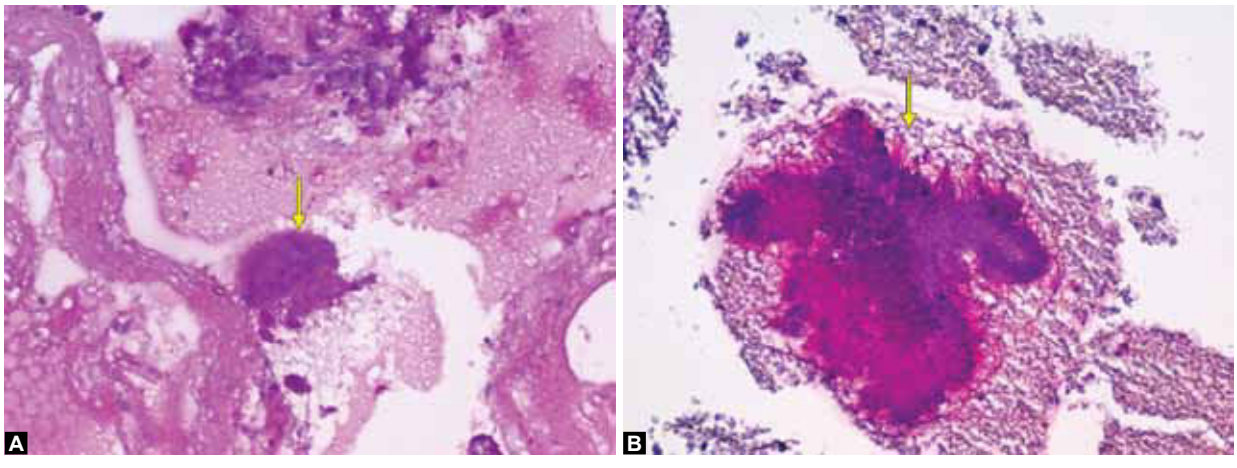
Patient reported no bleeding episodes following extraction and 6 months postoperative view revealed no pathology/recurrence (Fig. 12).

DISCUSSION

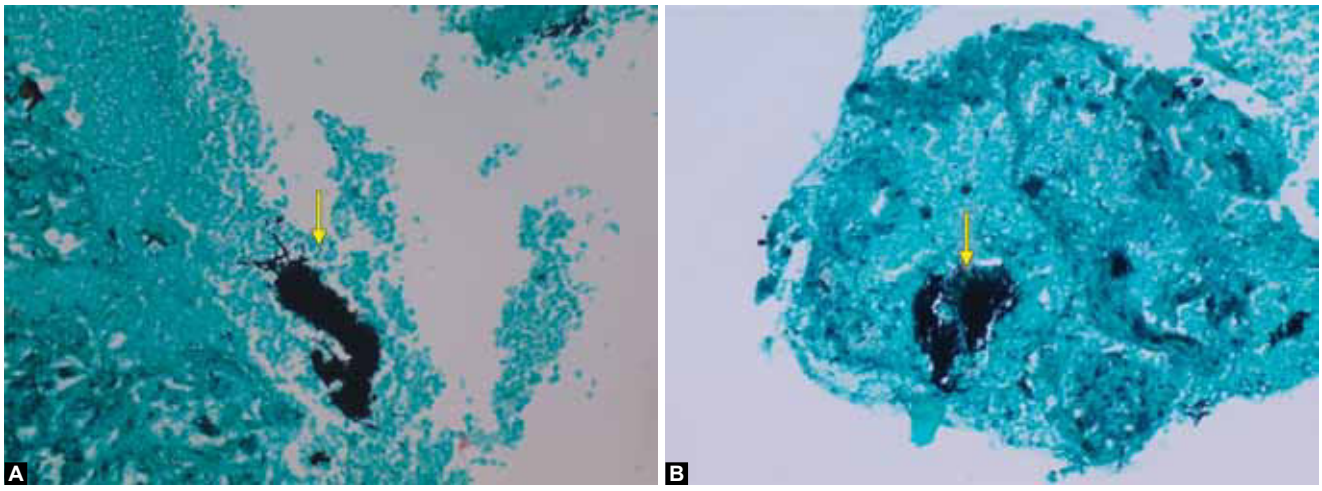
Actinomycosis is considered as 'the most misdiagnosed disease' even by experienced clinicians and is listed as a 'rare disease' by the office of rare disease (ORD) of the



Figs 6A and B: Hematoxylin and eosin staining showing actinomycotic colonies: (A) 10× magnification and (B) 40× magnification



Figs 7A and B: Periodic acid schiff staining showing actinomycotic colonies: (A) 10× magnification and (B) 40× magnification



Figs 8A and B: Grocott-Gomori methenamine silver nitrate staining showing actinomycotic colonies: (A) 10× magnification and (B) 40× magnification

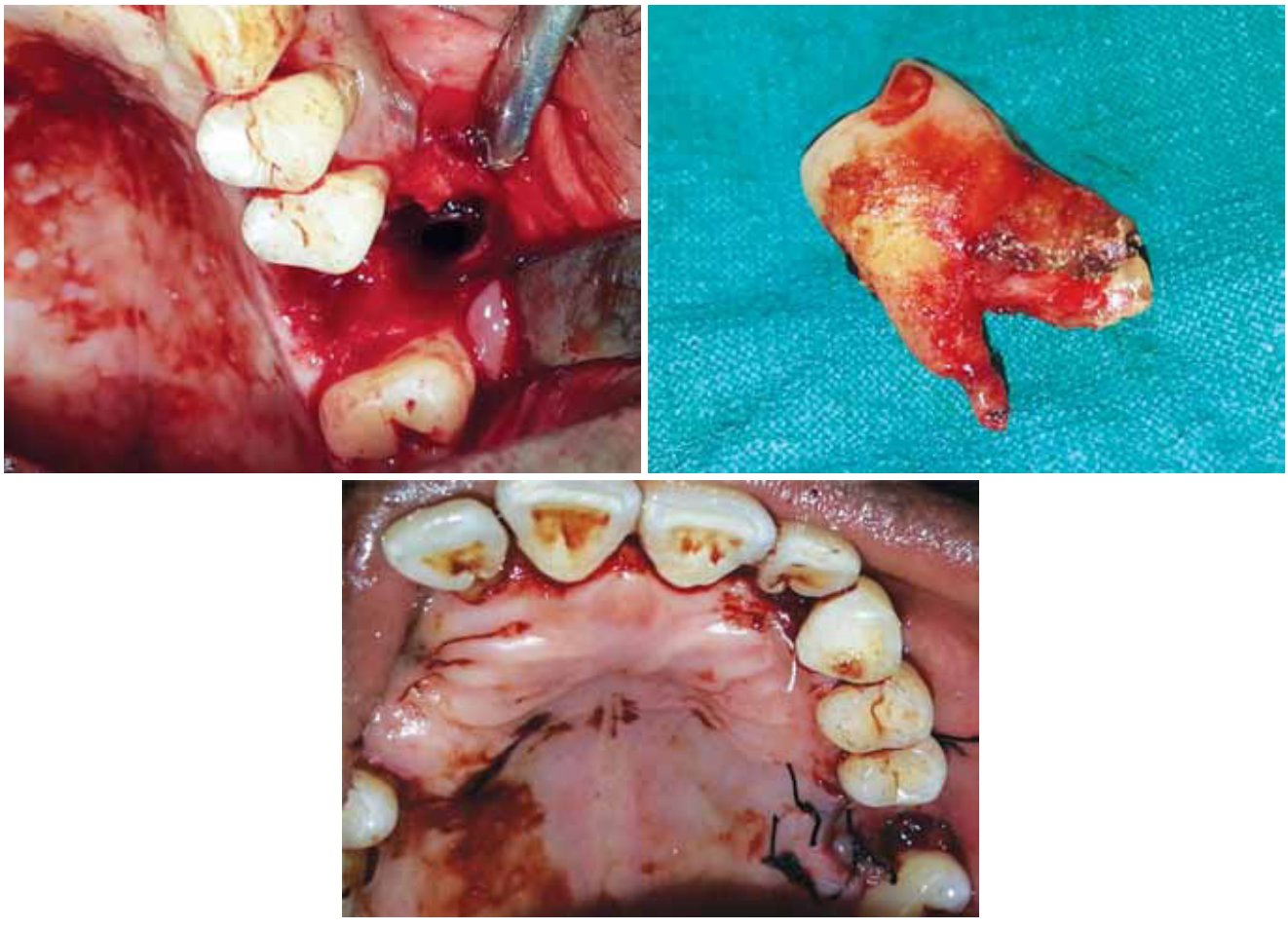


Fig. 9: Extraction of 26 with subsequent oroantral communication

National Institute of Health (NIH).[9] *Actinomyces* species can be found in calculus and in periodontal pockets. They may become pathologic due to poor oral hygiene, periodontal problems, trauma and following oral surgical procedures.[10] Relative low oxygen pressure conditions in these periodontally affected sites support their proliferation, thus providing a possible path of entry for the bacteria into the tissue.[11,12] Sinonasal, laryngeal and pharyngeal disease due to *Actinomyces* species is rarely encountered. Nagler et al presented a case limited to the left mandibular molar region representing a juvenile periodontitis—like lesion and emphasized the importance of early diagnosis of actinomycosis by dental professionals.[13] In a recent case reports, Rodan and Nam Ryang Kim reported presence of actinomycosis in periodontally affected sites.[14,15] In the present case, the *Actinomyces* species affected tooth was periodontally and endodontically involved and patient showed poor oral hygiene which

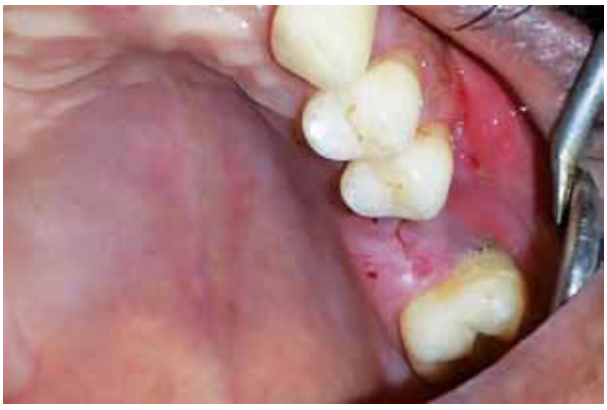


Fig. 10: 1 week postextraction

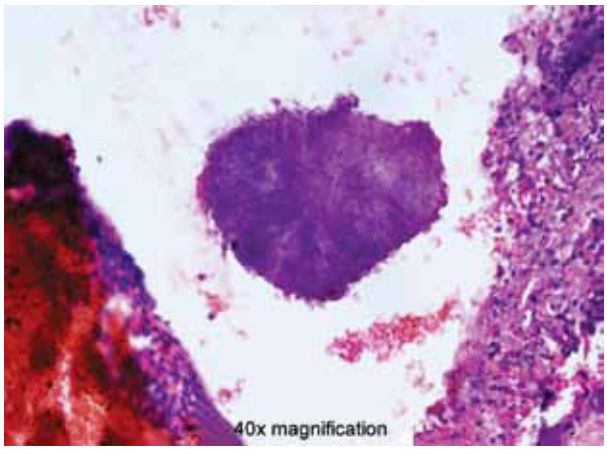


Fig. 11: Hematoxylin and eosin staining showing actinomycotic colonies

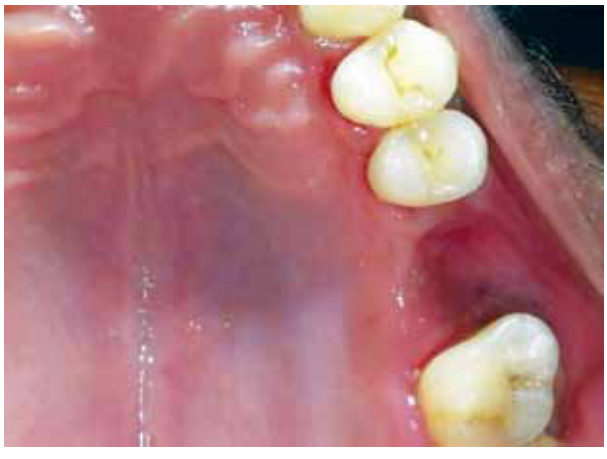


Fig. 12: 6 months postoperative view

could have resulted in proliferation and growth of this bacterial species. Also, the colonies were associated with inflammatory response which presented as granulation tissue with frequent episodes of bleeding. Actinomyces colonies can be identified using hematoxylineosin staining, Gram staining, PAS staining, GMS nitrate staining, exhibiting mass of filamentous bacteria, with variations in the color between the center and periphery of the colony, the so called 'sun-ray' effect.[16] In present case, H & E, PAS, and silver stains showed positive results.

The treatment for actinomycosis includes combination of surgical debridement of the involved tissues and the prolonged administration of antibiotics. The traditional treatment is usually a long-term course of penicillin, which includes 1 month of intravenous penicillin G (1 to 6 million units per day for cervicofacial type and 10 to 20 million units per day for thoracic and abdominal type), followed by weeks to months of oral penicillin.[17] A combination of amoxicillin and clavulinic acid (625 mg three times a day for 5 days) has also been used as it offers the advantage of coverage against penicillin-resistant aerobic and anaerobic copathogens.[13] Although comparatively lesser effective tetracycline, doxycycline (100 mg, 1st day-bid followed by once daily for 3 weeks) have also been administered because of their additional positive effects on periodontal tissues and gingival crevicular fluid.[6,18] In the present case, we prescribed the patient amoxicillin on 1st visit and amoxicillin and clavulinic acid combination on the 2nd visit. However, the frequent recurrence of the lesion could be attributed to the incomplete debridement of the lesion due to deep periodontal involvement. Eventually, the tooth was extracted and the parenteral amoxicillin and clavulunic acid combination was administered to the patient keeping in mind the histopathological diagnosis of *Actinomyces* infection. The oro-antral communication which was encountered at the time of extraction could be attributed to the chronicity of the lesion. As patient had received amoxicillin and clavulinic acid combination intermittently pre- and postoperatively, orally as well as parenterally, short-term dosage of antibiotic was prescribed after extraction. The patient did not present any recurrence of *Actinomyces* infection, because the infected tissue was totally excised.

CONCLUSION

Actinomycosis should be included in the differential diagnosis in cases where symptoms do not respond to the appropriate periodontal treatment. The importance of thorough microbiological and histopathological investigation cannot be overstressed in helping us to diagnose such an unresponsive periodontal lesion.

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