

## Cervicofacial actinomycosis: a case report

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### Summary

Actinomycosis is a chronic, granulomatous, infective disease that requires prolonged medication because of high resistance against therapy. The cervicofacial region is most commonly affected; thoracic and abdominal forms of the disease have also been distinguished. Generally, it is seen in mandible or maxilla after a trauma or by the way of an infected tooth and it is sometimes difficult to diagnose and it should be born in mind in the differential diagnosis of numerous infectious and non-infectious diseases. In our case a 28-year-old man with expansive extraoral swelling is reported.

**Keywords:** actinomycosis, cervicofacial, odontogenic.

### Introduction

Cervicofacial actinomycosis is a chronic granulomatous infectious disease caused by anaerobic and microaerophilic bacteria in the oral cavity. Generally *Actinomyces israeli* is the most common reason. It is caused by traumas of the orofacial region, extraction of a tooth or by the way of an infected pulp cavity. The common initial symptoms of infection are sudden onset of cervicofacial pain, swelling, erythema, edema and suppuration. Rarely regional lymphadenopathy is seen. However, lymphadenopathy and abscess formation is seen due to secondary infection. Sulphur granules, biopsy regimens and pathologic investigation are the most significant factors in the diagnosis of actinomycosis. In this case the treatment of a patient with cervicofacial actinomycosis with the symptoms of severe pain and swelling in the submandibular area is reported.

### Case Report

A 28 years old man without any systemic problems applied to our clinic with the complaints of severe pain and swelling in the submandibular area. In extraoral examination severe swelling, trismus, sensitiveness to palpation, fever of the site and expansive hardness of the environmental tissues were observed (*Figure 1*). In intraoral examination deep cavities on teeth 34, 35, 36 with periapical lesion were diagnosed by OPTG radiography (*Figure 2*).

Sefazolin 1000 mg 2x1 IV as antibacterial, Diclofenac sodium amp. 2x1 IM were prescribed to solve the pain problem. Two days later fistulization occurred and local complaints diminished. Several fistulas with pus formation were found in the submandibular region. At the same visit we operated the patient for drainage and drain was placed. Crystallized sulphur granules during the procedure were aspirated and that material was sent for pathological diagnosis. Penicillin G 1000 mg 2X1 IV was pre-

scribed for two weeks of medication.

Two days after the operation the patient was recalled. It was seen that pus drainage was almost inactive but no new fistulas were formed. The systemic and local complications disappeared.

At recall, one week after the operation neither pus material nor fistula formation were present (*Figure 3*). The drain was

extracted and the patient was recalled for controls. It was seen that all systemic and pain problem disappeared and no new fistulas were formed in a two-week follow up period (*Figures 4, 5*). We changed our prescription to Penicillin G 1000 mg 2x1 p.o. two weeks after the drainage procedure. After two months of follow up no local complications were observed.

**Figure 1**



View of the extraoral swelling at the first visit

**Figure 2**



OPTG of periapical lesions

**Figure 3.**

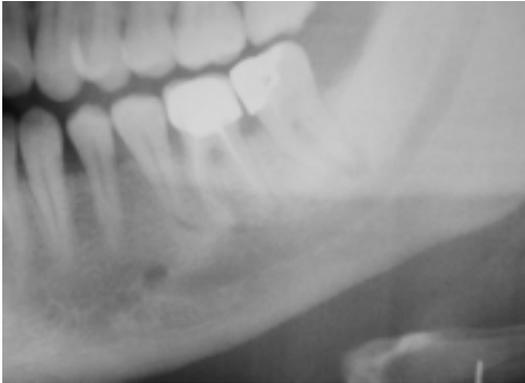


One week after the drainage operation

**Figure 4**



Three weeks after the operation (extraoral view)

**Figure 5.**

Three weeks after the operation (intraoral view)

## Discussion

Actinomycosis is a granulomatous, chronic and infectious disease. It was first described in the 19<sup>th</sup> century as a disease found in bovine animals. In 1981, Wolf and Israel isolated an anaerobic organism in human dental caries presenting growth of anaerobic oral filamentous organism. Currently, *Actinomyces* are formally classified as bacteria [1].

These bacteria can be divided into six subgroups: *israelii*, *naeslundii*, *viscosus*, *odontolyticus*, *meyeri*, and *pyogenes* [2,3].

Human actinomycosis is caused primarily by *Actinomyces israelii*, bacteria of normal oral flora. Being an anaerobic gram-positive, branched, filamentous bacterium, it resides as commensal in periodontal pockets and gingival crevices, in carious teeth, dental plaques, tonsillar crypts or in periodontium. Open wound, like dental extraction and trauma, facilitates the penetration. It is the most isolated one but not the sole causative agent of the disease. It has been described that the *Actinomyces* requires the presence of other types of bacteria in order to proliferate. In this sense, the oral flora determines the potential of oxygen reduction that would favor the growth of this anaerobic bacterium [1,2,4,5]. In our case

the infected pulp of the first molar, first premolar and second premolar mandibular teeth with periapical region were thought as initial factors of actinomycosis.

Spread by contiguity is another pattern of propagation. Numerous clinical manifestations of the disease have been described. The cervicofacial region (60%), the thoracic and the abdomen are most commonly affected, other possible sites of infection are the extremities, lacrimal glands, kidneys, genital organs, bones and the central nervous system [6].

Actinomycosis is mostly found in young adults, women are less frequently affected than men. This is due to more frequent maxillofacial lesions in men as a result of sports, automobile and motorcycle accidents, alcohol abuse, and aggressive behavior.

The cervicofacial variant is characterized by the appearance of solid sub- or supramandibular nodules or swellings, the overlying skin becoming purple to violet and warm. Subsequently fistulae or ulcerations arise with pus containing minute yellowish granules. Masticatory spasm may be present; on the other hand the general state of health is seldom affected. Local pain and fever are the most common symptoms. Regional adenopathy, in turn, is not common [6]. In our case submandibular swelling, severe pain, trismus, fever and hardness of the environmental tissues were observed.

The diagnosis of the cervicofacial form during clinical examination alone is difficult at the onset but becomes easy once the granules are discharged. We clearly observed sulphur granules during drainage operation. The biopsy specimen of an actinomycetic infection shows a central neutrophilic lobulated abscess that contains a number of granules surrounded by granulation tissue. Actinomycetic sulfur granules appear in HE stained sections as basophilic structures with elongated eosinophilic clubs that radi-

ate from the periphery [7]. The granules contain gram-positive, non-acid fast bacteria initially misclassified as fungi. Actinomycosis can be differentiated from nocardiosis in which granules consist of acid fast-branched bacilli, and botryomycosis containing non-filamentous cocci (bacilli) respectively [8]. Granules may be scarce or even absent [9], that is why culture and subsequent identification are necessary for the diagnosis. However, *Actinomyces* are difficult to grow even in enriched media and the diagnosis is confirmed by culture in less than 50% [10]. In such cases the diagnosis is based on the morphology of granules and bacteria or on direct examination of granules.

Penicillin in high doses and under hospital surveillance is the treatment of choice. It should be given on long-term basis (30 days on the average). The drug of choice is the crystalline penicillin. *Actinomyces* produce extensive fibrotic reactions with central necrotic lesion, resulting in hypovascular tissue with low potential for oxygen reduction and limited antibiotic penetration. Consequently, treatment requires high-dose, long-term antibiotic therapy, it depends on individual clinical and radiological

improvement of patients, and it should be administered intravenously for 3 to 6 weeks and orally, after hospital discharge, for 6 to 12 months. If penicillin cannot be used, erythromycin 2.0 gms/24 hours, tetracycline 2.0-3.0 gms/24 hours or lincomycin 2.0 gms/24 hours should be administered [11]. We applied penicillin G 1g IV for the first two weeks of period after we diagnosed actinomycosis and oral Penicillin G later.

In addition to antimicrobial therapy, surgical cleaning with abscess drainage and excision and curettage of devitalized tissue should be considered. Complete recovery is expected in 90% of patients with cervicofacial actinomycosis [12] as we got in our case.

## Conclusion

Cervicofacial actinomycosis must be diagnosed by the dentists in periapical chronic diseases. It is hard to diagnose and difficulties arise from the fact that it can mimic numerous common conditions in human pathology. If needed, the dentist must refer the patient for consultation. We got full recovery in our case after a month medical therapy and routine follow ups.

## References

1. Bennoff FD: Actinomycosis. Diagnostic and therapeutic considerations and a review of 32 cases. Laryngoscope, 1984; 94:1198-1216.
2. Branco BPC, Ferreira RLM, Evangelista SOC, Lemos SMA, Rabay GC. Actinomicose cervicotorácica. J Bras Med, 1995; 68:212-8.
3. Porto NS, Severo LC, Londero AT, Oliveira MEM, Picon P. Actinomicose pulmonar: estudo de onze casos observados no Rio Grande do Sul. An Med Rio Gde S. Porto Alegre 1984; 25:110-117.
4. Costa CPM, Nascimento CPPC, Kawachi J, Iasi M, Goluppo MTG, Iazzetti AW, et al. Actinomicose cervicotorácica na infância. J Bras Med, 1994; 64: 82-84.
5. Miller M, Haddad AJ. Cervicofacial actinomycosis. Oral Surg Oral Med Oral Pathol, 1988; 85: 496-507.
6. Bochev, I. Angelova and N. Tsanko: Cervicofacial actinomycosis-report of two cases. Acta Dermatoven APA 2003; Vol 12, No 3: 105-108
7. Burden P: Actinomycosis. J Infect 1989; 19: 95-9.
8. Wee SH, Chang SN, Shim JY et al. A case of primary cutaneous actinomycosis. J Dermatol (Tokyo), 2000; 27: 651-654.
9. Brown JR.: Human actinomycosis, a study of 181 subjects. Hum Pathol 1973; 4: 319-330.
10. Ashton N, Cook C: Allergic granulomatous nodules of the eyelid and conjunctiva. Am J Ophthalmol, 1979; 87: 1-28
11. Lerner PI: The lumpy jaw, cervicofacial actinomycosis. Infect Dis Clin North Am 1988; 2: 203-19
12. Katz BJ, Kalter DC, Bruce S: Subcutaneous nodules in a man diagnosed as having tuberculosis. Arch Dermatol, 1988; 124: 121-122,124-125.

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