Case Report

Chronic odontogenic osteomyelitis and facial actinomycosis of six-month duration

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Introduction
Actinomycosis is a rare chronic infection. If untreated, the disease can lead to a high (>60%) mortality rate (Falchero et al., 1997). Bacteriological diagnosis is difficult because slow-growing Actinomyces israelii is masked by faster-growing co-infecting bacteria in clinical specimens and the characteristic sulfur granules may be single/absent in parts of specimens (Wong et al., 2011). This study revealed a case of odontogenic osteomyelitis of the right mandibular region in association with facial actinomycosis involving A. israelii and two anaerobic species.

Case report
A 55-year-old man was admitted to the Maxillo-Facial Surgery Hospital and hospitalized for 11 days. The onset of symptoms had started 2 months previously, 2 days after extraction of tooth 47 (right mandibular second molar) because of an exacerbated periodontal abscess. For this reason, the patient had taken consecutively doxycycline, tetracycline/oleandomycin, ampicillin and ciprofloxacin, each for 5–10 days, without clinical improvement. At the time of admission, purulent infection in the right mandibular region and an abscess in the right subtemporal region were observed. The patient had enhanced dental calculus. Orthopantomography showed osteolysis (10 × 10 mm) near teeth 47 and 48 with two sequestrums. Histological examination revealed chronic fibrosing osteomyelitis with sequestrums. The sedimentation rate was at 28 mm h⁻¹. Incisions and open drainage of the affected tissues and focus of osteomyelitis were performed. The patient was treated with lincomycin (600 mg every 8 h) for 8 days and, after clinical improvement, he was discharged.

Two months later, because of a relapse, specimens from the parotid space were taken for anaerobic culture (Fig. 1). The skin surface was cleaned with iodophor for 1 min and incisions were made. Curettings of the infected tissue were placed into Stuart transport medium (BBL) and processed within 2 h. The specimens were inoculated onto Schaedler blood agar (BBL) with vitamin K/haemin, and incubated...
anaerobically at 37 °C for 14 days. Isolates were identified according to Wadsworth Anaerobic Bacteriology Manual (Jousimies-Somer et al., 2002), as well as by API Rapid ID 32A (bioMérieux). Susceptibility to penicillin, clarithromycin, metronidazole, amoxicillin/clavulanate and ampicillin/sulbactam was determined by an agar dilution method (Jousimies-Somer et al., 2002).

Single sulfur granules were seen in direct Gram-stained smears. Both specimens grew A. israelii, Fusobacterium nucleatum and Parvimonas micra. A. israelii grew after 11 days incubation. An 8-day treatment with oral clarithromycin (500 mg every 12 h) was started together with surgical incisions of the affected tissues. The third specimen, taken 12 days after the first one, showed no bacterial growth. However, smears revealed single, Gram-positive filamentous Actinomyces-like rods, and thus the treatment was prolonged by oral amoxicillin/clavulanate (625 mg every 12 h) for an additional 2 weeks. Gradual clinical improvement and healing were achieved. Nine months and 3 years later, the follow-up examinations confirmed that the patient was fully recovered.

**Discussion**

The male sex, age of the patient, tooth extraction and severe dental calculus were predisposing factors for actinomycosis (Wong et al., 2011; Badre et al., 2013). The P. micra strain was susceptible to all antibacterial agents. The penicillin resistance of F. nucleatum (MIC 2 mg l⁻¹) according to European Committee on Antimicrobial Susceptibility Testing (EUCAST) breakpoints and the elevated clarithromycin MICs against F. nucleatum (MIC 2 mg l⁻¹ against the first isolate and 4 mg l⁻¹ against the second isolate) and A. israelii (MIC 2 mg l⁻¹) could be due to the previous antibiotic treatments. As the treatment should initially cover both Actinomyces spp. and the other co-infecting bacteria at the site of infection (Reichenbach et al., 2009), the therapy started with clarithromycin because of penicillin resistance of the coexisting anaerobic bacteria. Because of possible side effects of a prolonged clindamycin therapy, macrolides are an alternative to penicillin for treating actinomycosis (Badre et al., 2013). β-Lactamase-positive F. nucleatum isolates have been reported (Jousimies-Somer et al., 2002; Mosca et al., 2007). F. nucleatum resistance to penicillin and clarithromycin (2 mg l⁻¹) motivated a treatment prolongation with amoxicillin/clavulanate to prevent a relapse of infection. All isolates were susceptible to amoxicillin/clavulanate and ampicillin/sulbactam.

Actinomycosis requires longer therapy compared with that for most other infections because of the species-specific antibiotic tolerance of A. israelii, and the induration and avascularity of infected areas (Barnard et al., 1996; Reichenbach et al., 2009) In some cases of orofacial actinomycosis, shorter (2–6 weeks instead of the classical 6–12 months) therapy combined with surgical drainage has been reported to be successful (Wong et al., 2011). In the present case, the treatment lasted over 3 weeks and was curative.

In conclusion, actinomycosis is a rare but serious chronic infection. Clinical and bacteriological diagnosis and therapy of actinomycosis are specific and difficult. The patient was treated inappropriately with successive courses of antimicrobial agents, including ciprofloxacin, which has no activity against most anaerobes. The clinical progress of the disease strongly emphasizes the need for early surgery, earlier anaerobic cultures and more prolonged antimicrobial therapy for severe odontogenic infections. In this case of facial actinomycosis, the successful therapeutic outcome required a prolonged therapy as well as the detection of drug-resistant co-existing anaerobic bacteria.

**References**


