

Septic arthritis of the knee due to *Prevotella loescheii* following tooth extraction

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Abstract

This is a case report of septic arthritis of the knee due to *Prevotella loescheii*, in a patient with advanced arthrosis. Two weeks beforehand he had undergone a dental root extraction without antibiotic prophylaxis. His knee had become inflamed 48 hours after extraction and he was started on ibuprofen and steroid treatment (prescribed by his primary health care doctor). With a provisional diagnosis of septic arthritis, synovial fluid was taken for study. Antimicrobial therapy was commenced with amoxicillin/clavulanic acid and the patient progressed satisfactorily.

Prevotella loescheii was identified by anaerobic culture. A site of origin for the infection was never found. Joint infection is generally secondary to haematogenous dissemination of bacteria from habitual sites such as odontogenic locations. We suggest that patients with inflammatory arthropathies should be considered as candidates for antibiotic prophylaxis in oral surgery and invasive dental procedures. We suggest, in these cases, the use of antibiotic with spectrum against aerobic and anaerobic bacteria.

Key words: Septic arthritis, *Prevotella loescheii*, tooth extraction, antibiotic prophylaxis.

Introduction

The oral odontopathological flora can cause bacteraemia and infectious metastases such as septic arthritis following invasive dental procedures. Anaerobic bacteria are an uncommon cause of septic arthritis. This is a case report of septic arthritis of the knee due to *Prevotella loescheii* in 75-year-old male, who presented at the Admission Department of our hospital with fever of 38.2°C, painful swelling of his left knee and general malaise. Two weeks beforehand he had undergone a dental root extraction, without antibiotic prophylaxis. His knee had become inflamed 48 hours after extraction and he was started on ibuprofen and steroid treatment (prescribed by his primary health care doctor). Medical history of note was: hypertension, poor arterial and venous circulation in legs,

renal calculi and major bilateral gonarthrosis.

On general examination, the patient did not show any pathological signs except in his legs: painful swelling was observed in his left knee, with fixed flexion deformity of 20°, synovial effusion and oedema in the distal third of his leg. Homan's sign was negative, pedal pulses were palpable and deep vein thrombosis was ruled out on Doppler ultrasound. A blood test showed a leukocyte recount of 18.8 x 10⁹/L, with 90% polymorphonuclear neutrophils, C-reactive protein 18.5 mg/dL, and sedimentation rate 65mm. Other parameters were normal. Urine and blood samples were taken for culture, and serum samples were taken to detect antibodies against *Brucella melitensis*, *Borrelia burgdorferi* and *Treponema pallidum*. With a provisional diagnosis of septic arthritis, synovial fluid

was taken for study. While awaiting results, antimicrobial therapy was commenced with amoxicillin/clavulanic acid. The drained fluid was purulent, with a leukocyte count of 94,400 (80% polymorphonuclear leukocytes), glucose 1 mg/dL, and staining (Gram and Ziehl-Neelsen) did not show microorganisms. The sample was inoculated onto solid media (blood agar and chocolate agar), and they were incubated at 35° C for 48 hours in a 5% CO₂ atmosphere, as well as in aerobic and anaerobic blood culture bottles that were incubated in a BACTEC 9240 automated system (Becton Dickinson, Diagnostic Systems, Sparks, MD) for 5 days. Culture in solid media was negative, but on day 3 growth was detected in the anaerobic bottle and therefore subcultures were performed on this sample in blood agar and chocolate agar under the same conditions as described above, and in brucella agar that was incubated in an anaerobic atmosphere for 48 hours. The aerobic culture was negative again, but in the brucella agar it was observed that there was a growth of small greyish colonies surrounded by a ring of beta haemolysis. Gram staining showed a non-sporulating gram-negative bacillus. Catalase, oxidase and indole tests were negative. *Prevotella loeschii* was identified using the Rapid ID 32 A system (BioMérieux, Marcy l'Etoile, France). The *in vitro* sensitivity study against penicillin, amoxicillin/clavulanic acid, piperacillin/tazobactam, clindamycin and metronidazole was performed by E-test (AB Biodisk, Solna, Suecia) in brucella agar, showing that the strain was sensitive to all of them. Urine and blood cultures were negative, as was serology.

Initially, the joint was flushed with 6 litres of physiological saline by means of an arthrotomy. Later, it was flushed with 10 litres of physiological saline using an arthroscopic approach, and performing extensive synovectomy through synoviotomy, cartilage shaving and drainage with aspiration. Antibiotic therapy was maintained for 4 weeks, and the patient progressed satisfactorily. The leukocyte count rapidly returned to normal and C-reactive protein was normal (0.3 mg/dl) one month after the end of treatment. Treatment was complemented with rehabilitation through physiotherapy.

Discussion

Anaerobic bacteria are an uncommon cause of septic arthritis. Fitzgerald et al (1) conducted a review of cases of septic arthritis caused by anaerobic bacteria over three years (43 patients and 46 infected joints). Hip and knee joints were most commonly affected, and in 81.4% of cases the infection occurred after surgery and/or trauma. In this group, anaerobic gram-positive cocci such as *Peptostreptococcus magnus* were predominantly isolated. However, in 8 out of the 43 patients, septic arthritis presented as a complication of a chronic debilitating disease (rheumatoid arthritis, psoriatic arthritis, and others), some of which were treated with steroid therapy. In this group there was

a predominance of anaerobic gram-negative bacteria such as *Bacteroides fragilis*. In three patients arthritis presented after gastrointestinal surgery, and in another it was associated with a sacral decubitus ulcer. Nolla et al (2) studied 10 cases of septic arthritis in patients with rheumatoid arthritis who were receiving steroid therapy. Two cases were due to anaerobic bacteria, and it was concluded that rheumatoid arthritis (RA) is a risk factor for septic arthritis. Alegre-Sancho et al (3) reported a case of septic arthritis due to *Prevotella bivia* in a patient with RA who was on low-dose steroid therapy. Bacteria from the genus *Prevotella*, together with *Fusobacterium*, *Porphyromonas*, *Actinobacillus*, *Eikenella* and *Peptostreptococcus* form part of oral odontopathological flora, intestinal flora, and in other anatomic locations. Bacteria from these locations can cause bacteraemia and infectious metastases such as septic arthritis following invasive dental procedures, particularly in debilitated patients with a susceptible site of infection (4). Sonsale et al (5) reported a case of septic arthritis of the knee due to *Fusobacterium necrophorum* three weeks after the drainage of a dental abscess. Garnetta (6) reported a case of septic arthritis of the sternoclavicular joint caused by *Prevotella melaninogenica* from an unknown site of origin. Flesher et al (7) reported a case of septic arthritis of the knee in a 22-year-old patient with a history of haemarthrosis, due to *Eikenella corrodens* and *Streptococcus viridans* (both of which colonise the mouth) following dental manipulation. Steingruber et al (8) informed on a case of infection with *Prevotella loeschii* following total hip arthroplasty in a patient who had undergone many dental procedures, providing strong evidence for the mechanism of a haematogenous infection from a dental source.

Joint infection is generally secondary to haematogenous dissemination of bacteria from habitual sites such as odontogenic locations. In this case report chronic inflammation of the knee joint and the use of steroids contributed to the onset and development of septic arthritis following a tooth extraction. We believe that this fact is of relevance because joint infections caused by anaerobic bacteria should be considered not only in patients with recent joint prostheses but also in those who have chronic inflammatory arthropathy, especially following surgical procedures in the digestive tract or mouth. Although in this case report the *Prevotella* strain was sensitive to penicillin, in our setting we have observed that bacteria in this genus are beta-lactamase producers in 54.1% of cases (9). Although arthrosis is not an indication for antibiotic prophylaxis in oral surgery, prophylaxis could be justified in certain patients. We suggest, in these cases, the use of antibiotic with spectrum against aerobic and anaerobic bacteria.

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