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**Case Report**

# Septic arthritis of multiple native joints following tooth extraction

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## ABSTRACT

Infection of the distant parts of the body especially the joints after a tooth extraction is uncommon, but when it occurs due to the virulence of the organism or due to the risk factors, it may cause severe joint infection with abscess formation and may limit the movements. We report a case of arthritis of the knee joint along with involvement of other joints following mandibular third molar teeth extraction one week postoperatively. The patient had swelling and limited range of motion of the involved joints, pain over other multiple joints. The patient had two episodes of postoperative septic arthritis following each mandibular third molar extraction. He was diagnosed of having septic arthritis and treated with antibiotics, analgesics, and steroids, that resolved after 3 weeks.

**Keywords:** Septic arthritis, Bacteremia, Total knee arthroplasty, *Streptococcus*

## INTRODUCTION

Space infections involving buccal, canine, submandibular spaces, etc are a result of the spread of infection from the dental origin to the local tissues which is a very common phenomenon. But spread of infection to the distant part via the hematological route is uncommon. Septic arthritis following bacteremia arising from dental and periodontal origin occurs in patients with prosthetic joints and is relatively less common in native joints.[1] Septic arthritis is majorly caused by anaerobic bacteria. Joint infection is secondary to hematogenous dissemination of bacteria from foci of infection such as odontogenic infection.[2] *Streptococcal* species are most common organisms leading to septic arthritis. In this case report, there is an unusual representation of septic arthritis of native joints without any underlying systemic condition/ risk factors.

## CASE REPORT

A male patient aged 42 years reported to the department of oral and maxillofacial surgery with a chief complaint of pain in the mandibular left 3rd molar tooth for fifteen days. On clinical and radiographical examination he had caries with left mandibular third molar and the tooth were tender on percussion (Figure 1). The patient had no significant medical history. All the vitals were examined and were within normal limits. Extraction of mandibular left 3rd molar was done under local anesthesia with all the aseptic precautions and sutures were placed. Post-op antibiotic with amoxicillin 500 mg 3 times daily and analgesics with diclofenac 2 times daily, both orally were prescribed for 5 days and was recalled after 7 days.

On the tenth postoperative day, the patient revisited for suture removal. Wound healing was satisfactory. At this time patient revealed that on the sixth postoperative day, he had severe pain and swelling over his left knee, pain over the right knee, unable to flex his left leg, pain over the shoulder joints bilaterally while moving the hand, and pain over neck region. He also had a fever and headache. The patient had visited his family physician on the seventh postoperative day where he was diagnosed with reactive synovitis or septic arthritis following tooth

extraction. Blood investigation report-WBC-11,000/cubic millimeters, neutrophils 86%, ESR 44 mm (at the end of one hour by Westergren method). He was given Etodolac 400 mg, hydrochloroquine sulphate 200 mg, Indomethacin 75 mg once daily at night for 30 days, doxycycline 100 mg twice daily for 2 weeks report. He was prescribed analgesics and steroids for one month.

The patient also gave similar history following the removal of the right mandibular third molar 4 years back which he had denied during history taking in his first visit. He had pain and swelling on both right and left knee joints, pain over the neck shoulder hip region, fever after 6 days of extraction. He was diagnosed with reactive arthritis and hospitalized for one week for the same. His hemogram during the first event was within the normal limits, except ESR-86 mm (at the end of the first hour by Westergren's method) by his family physician, neutrophils-80%, WBC-11500/ cubic millimeters. He was advised etodolac SR 400 mg, sulfasalazine 500 mg, Prednisolone 10 mg, doxy 100 mg once daily for 15 days. He had recovered after 3 weeks completely.

The patient was advised C-reactive protein, the value (40 mg/L) obtained was indicative of infection. The patient recovered completely after one month. The patient's blood that was sent for culture, revealed *Streptococcus* as the causative organism (Figure 2).

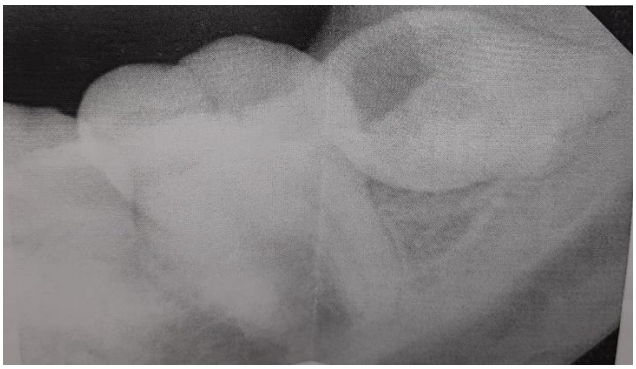

**Figure 1: Intra oral periapical radiograph of 3rd molar.**

**Figure 2: Blood culture on the agar medium of *Streptococcus* colonies of mild hemolysis.**

## DISCUSSION

The microbial flora of the oral cavity consists of a plethora of micro-organisms, constituting majorly of the bacteria. The presence of immunocompromised conditions such as diabetes or change in the pH of saliva results in a shift of equilibrium leading to orofacial space infection. It may result in a simple abscess to the life-threatening infection of the neck like Ludwig's angina, which is a common manifestation.

Septic arthritis occurring due to bacteremia from dental procedures is not a common phenomenon and it generally occurs in prosthetic joints.[1] A systematic review was carried out by Richard et al in the year 2020, that studied the prosthetic joint infection (PJI) in total hip (THA) or total knee arthroplasty (TKA) following a dental procedure.[3] A total of forty-four cases of PJI in THA or TKA associated with dental procedures were analysed. The common organisms procured in the prosthetic joint infections after the dental procedure are *Staphylococcus* and beta-hemolytic *Streptococci*.[4-7] Predominantly, septic arthritis involves the weight-bearing joints of the hip and knee, which account for nearly 60% of cases.[8] Apart from the above-mentioned joints, sternoclavicular, acromioclavicular, sacroiliac, and, spondylodiscitis involvement has also been reported. In this case, the patient developed septic arthritis in multiple joints including the knee, shoulder, and neck.

The exact pathophysiology of septic arthritis following the dental procedure is still not clear. The main routes for developing septic arthritis include direct inoculation secondary to penetrating trauma or hematologic spread.[8] It is more common in prosthetic joints than native joints. In this case, the patient has no prosthetic joints or any medical history relevant for septic arthritis.

Remote body site infection, recent surgical procedure, advanced age, obesity, diabetes mellitus, altered immune response, lifestyle factors including nutritional status, tobacco use, and other factors including coexistent corticosteroid therapy, length of preoperative hospitalization and colonization with microorganisms are major risk factors for postoperative infection. [9]

The culture of the joint aspirate is specific for diagnosing infection in the joint. However, the use of a combination of tests, including serologic tests measuring white-blood-cell count, erythrocyte sedimentation rate (ESR), and C-reactive protein level are required for an accurate diagnosis. Depending on the severity of arthritis, antibiotic prophylaxis along with analgesics and steroids might be employed. In

few cases, surgical intervention is required such as incision and drainage or arthrocentesis. In this case report, the patient does not have any history of total hip or total knee arthroplasty, diabetes mellitus or, any other relevant past medical history. The exact pathophysiology

of this kind of septic arthritis is unknown. The patient had a similar history few years prior which was not mentioned by the patient during the history taking. This case report throws light on how the microbial flora present in the oral cavity can affect distant sites of the body via the hematogenous route.

## CONCLUSION

Preoperative history of underlying systemic disorders or past history is very important to prevent post-operative local or systemic complications. Septic arthritis can be mild or severe that depends on the type of organism, the virulence of the organism, host response and, systemic condition of the patient. After assessing this case report, we recommend preoperative prophylactic antibiotics for people who undergo invasive dental procedures. With the early presentation of the complications by the patient, the disease can be treated completely. This case emphasizes that good oral hygiene influences the general health of the patient.

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