Acute Septic Arthritis of the Temporomandibular Joint: A Case Report

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急性化膿性顎関節炎の1例

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Abstract: We describe our experience with a case of acute septic arthritis of the temporomandibular joint (TMJ) from contiguous spread of odontogenic infection. An 80-years-old woman was referred to our hospital because of swelling over the right TMJ and trismus. On the basis of clinical and imaging findings, acute septic arthritis of the TMJ associated with severe post-extraction infection and acute osteomyelitis of the right side of the mandible were diagnosed, surgical drainage and antibiotic therapy (ABPC/SBT and CLDM) were performed. Our experience suggests that cases with trismus are required for adequate differential diagnosis including imaging examination.

Key words: septic arthritis (化膿性顎関節炎), temporomandibular joint/MI (顎関節), trismus (開口障害)

(Received Feb. 5, 2016)

Introduction

Acute septic arthritis is a rare serious infection characterized by pain, fever, swelling, and often loss of function in the affected joint or joints1). Knees and hips are the most commonly affected joints; the temporomandibular joint (TMJ) is infrequently affected2). The overall incidence of acute septic arthritis of the TMJ is thought to be 2-10 cases per 100,000 and is generally confined to adults3). A few cases in infants or children have been reported2, 4, 5). Acute septic arthritis of the TMJ has multiple etiologies including blunt trauma, head and neck infection, hematogenous dissemination from a distant focus, and recently, bisphosphonate-related necrosis of the jaw4, 6, 7). However, no unified diagnostic criteria have been established owing to the few reported cases4).

We describe our experience with a case of acute septic arthritis of the TMJ.

Case Report

An 80-years-old woman was referred to our department in March 201X with slight swelling in the right mandibular region that had begun a month previously. She underwent extraction of the right second and third mandibular molars because of severe periodontitis. Four days later, she returned to our department with a pain-
ful swelling over the right TMJ and trismus. There was no history of TMJ-related disease or trauma to the maxillofacial complex.

On physical examination, the patient had severe malaise. The vital signs were as follows: body temperature 36.6℃, heart rate 86bpm, blood pressure 144/81mmHg, and SpO2 98% on room air. Facial examination revealed mild bone-hard, diffuse right preauricular swelling, with tenderness of the parotid-masseter and mandibular regions. The preauricular region was the most painful. Oral examination revealed swelling, redness, and tenderness in the molar region of the right mandible, and purulent discharge from the tooth sockets. Posterior open-bite malocclusion was unclear because of non-vertical stop occlusion. Mandibular movement was markedly restricted, with maximum mouth opening between upper and lower incisors limited to less than 10mm. Laboratory tests showed a white blood count of 15.6×10^9/l and a C-reactive protein level of 25.9nmol/l.

Panoramic examination showed diffuse sclerotic changes in the right side of the mandible from the molar section to the articular process (Fig. 1). Enhanced computed tomography (CT) showed low density in the upper and lower joint space and soft tissue around the condylar neck extending into the masticator space, with associated superior and posterior bone destructions of the condyle (Fig. 2A, B, C). In addition, head of the right condylar deviation associated with the joint space widening was observed (Fig. 2D). On the basis of these findings, acute septic arthritis of the right TMJ caused by post-extraction infection was suspected.

Surgical drainage was performed from the masseteric space to the condyle through a submandibular approach, and drainage of the pterygomandibular space was performed through an intraoral approach. The resulting purulent fluid was submitted for culture; a blood culture was also sent. The patient was initially treated with sulbactam/ampicillin (6g/d) and clindamycin (1.2g/d) after admission. After the surgery, axial fat-saturated T2-weighted magnetic resonance images (MRI) showed that heterogeneous increased signal intensity in the bone marrow of the right condyle, ramus and body (Fig. 3A and B) and increased signal intensity with upper and lower capsular widening compared with opposite side (Fig. 3C, D), suspecting intra-articular fluid including abscess. These finding suggested acute septic arthritis of the TMJ caused by acute osteomyelitis of the right mandible. Final bacterial culture examination and blood culture examination showed no growth. Follow-up blood tests again showed a normal C-reactive protein level fourteen days after admission. The patient began jaw-opening exercises, and was discharged on the twenty-first hospital day, visiting our department as an outpatient over a 3-month postoperative period. Her maximum mouth opening improved to 35mm. There have been no signs of recurrent infection 22 months after surgery.

**Discussion**

No clear consensus has been established on the opti-
management of acute septic arthritis of the TMJ because there have only been a few cases\(^1\). Herein, we reported a case of acute septic arthritis of the TMJ that were successfully treated and aimed to provide better understanding of them.

Acute septic arthritis of the TMJ may be rare because the small number of reported cases might be the result of misdiagnosis of other cases of the disease; there may also be under-reporting because of the atypical clinical manifestations\(^1,7\). Therefore, the differential diagnosis with neoplasms (i.e., synovial chondromatosis and parotid tumors arising within the deep lobe), parotitis, and particularly TMJ disorders can be important\(^6,8\). It has been reported that the TMJ is generally resistant to infectious even if bacteria enter into the synovial fluid of the TMJ, since TMJ acts as a pumping effect with high mobility and has highly venousplexus\(^9\). On the other hand, as it has been reported that bacteria are always present in the synovial fluid of a normal TMJ, the TMJ cannot be indicative of low infectivity\(^10\).

In the clinical features of our case, severe post-extraction infection and acute osteomyelitis of the right mandible occurred, and progressed to abscess formation involving the joint cavity and soft tissues around the condyle and the masticator space, with associated partial destruction of the condyle. Therefore, we diagnosed the acute septic arthritis of the TMJ caused by acute osteomyelitis of the right mandible. Although our case was possible to diagnosis by enhanced CT examination, it should be performed preoperative MRI examination for more definitive diagnosis. The TMJ/condylar involvement was most likely due to contiguous spread of infection, rather than hematogenous spread.

Various methods of TMJ surgical drainage and decompression have been reported, including needle aspiration, arthroscopy, and arthrotomy\(^1,6\). Moreover, when an abscess in the infratemporal space is also found, surgical drainage using a submandibular incision is recommend-
In severe infections of the head and neck region, early diagnosis, immediate surgery, and adequate antibiotic therapy lead to good outcomes. In our case, as abscess formation was found both in the joint cavity and infra-temporal fossa, surgical drainage through a submandibular incision and antibiotic therapy yielded good outcome.

Broad-spectrum antibiotics such as penicillin or cephalosporins are commonly used in these infections. These agents are administered intravenously at first, and changed to an oral formulation after the joint infection is under control. As the final bacterial and blood cultures showed no growth, we continued penicillin/clindamycin therapy. Intravenous penicillin with clindamycin was effective, suggesting that they may be an effective first-line therapy for acute septic arthritis of the TMJ. In the literature, the isolation rate for a pathogen was approximately 12.5%, possibly because of antibiotic use before the patient’s hospitalization. In our case, it may relate to administration of antibiotics for three days after the extraction.

Physical therapy is necessary to improve mandibular range of motion and maximum mouth opening. Early rehabilitation exercise is important to avoid complications such as fibrosis, ankylosis, and joint dysfunction. Arthroscopy is recommended for the patient with severe osteoarthritis or fibrosis. In our case, jaw-opening exercises was performed in the convalescent stage and yielded good outcome.

In conclusion, we described a case of acute septic arthritis of the TMJ. It is speculated that case with trismus and poor inflammatory findings are often difficult to make the differential diagnosis. Therefore, the diagnosis...
should be determined by the clinical presentation, imaging findings, joint fluid analysis, and laboratory findings.

Conflict of interest statement: None declared.

Reference

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