Septic Arthritis of the Temporomandibular Joint without an Apparent Source of Infection: A Case Report

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Abstract

Septic arthritis of the temporomandibular joint (TMJ) is a rare disease that is characterized by preauricular pain, edema, malocclusion, trismus and abscess formation in the TMJ region. An 85-year-old male visited our hospital with the complaint of left-sided TMJ swelling, pain and trismus. Septic arthritis of the left TMJ was diagnosed on the basis of considerable elevation of CRP (Creactive proteins) and CT imaging findings. The patient was treated with oral Faropenem at 450 mg daily, but CRP increased three days after the initial visit. He was hospitalized and treated with intravenous administration of cefazolin at 2 g and clindamycin at 1.2 g daily for six days. Propionibacterium species and Veillonella species grew in a culture of the joint aspirate, but there was no apparent source of infection. After acute infectious symptoms had passed, the patient was treated with oral amoxicillin at 750 mg daily for eight weeks and was instructed to do jaw opening exercise. The patient was discharged on the 11th hospital day. After three weeks of the hospital discharge, the patient healed completely. To avoid serious complications, clinicians should include septic arthritis of the TMJ in the differential diagnosis of preauricular pain, trismus and swelling.

Keywords
Septic Arthritis, Temporomandibular Joint, No Apparent Source of Infection

1. Introduction
Septic arthritis of the temporomandibular joint (TMJ) is a rare disease that is characterized by preauricular pain, edema, malocclusion, trismus and abscess for-
mation in the TMJ region. Early diagnosis and treatment are essential to avoid possible complications such as dissemination of infection, joint dysfunction, growth disturbances, fibrosis, and ankyloses [1] [2] [3] [4]. The pathogeneses of the infections include hematogenous dissemination from a distant site, local spread and direct inoculation [5] [6] [7] [8] [9]. In this paper, a case of septic arthritis of the TMJ without an apparent source of infection is described.

2. Case Report

An 85-year-old male visited our hospital with the complaint of left-sided TMJ swelling, pain and trismus over the past several weeks. Although a primary dentist administered an antibiotic agent, the symptoms did not improve. He had medical histories of paroxysmal atrial fibrillation, hypertension, hyperlipemia and diabetes mellitus, old myocardial infarction, cataracta and spinal canal stenosis.

A physical examination revealed obvious swelling, redness and tenderness of the left preauricular area (Figure 1). Maximum mouth opening was limited to 20 mm without deviation of the mandible. The gingiva, tongue, and oral mucous membrane showed no inflammatory signs except for percussion pain of the left lower second molar tooth. The patient had a slight fever of 37.0˚C and his vital signs were normal. Results of laboratory studies were as follows: hematocrit, 43.2% (normal, 35.6% to 45.4%); hemoglobin, 14.6 g/dl (normal, 10.8 to 14.9 g/dl); red blood cell count, 465 × 10⁶/mm³ (normal, 3.78 to 4.99 × 10⁶/µl); white blood cell count, 5650/µl (normal, 3040 to 8540/µl); C-reactive protein (CRP), 8.53 mg/dl (normal, less than 0.3 mg/dl); Rheumatoid factor, 7.41 IU/ml (normal, less than 15 U/ml); and hemoglobin A1c (HbA1c), 6.8% (normal, 4.6 to 6.2%) (Table 1).

A panoramic radiograph showed coarsening of the trabecular pattern of the left condyle (Figure 2), and computed tomography (CT) images showed diffuse
Table 1. Hematological findings at the initial visit.

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Normal value range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red blood cells</td>
<td>4.65 × 10⁶/µl</td>
<td>3.78 - 4.99 × 10⁶/µl</td>
</tr>
<tr>
<td>Haemoglobin (Hb)</td>
<td>14.6 g/dl</td>
<td>10.8 - 14.9 g/dl</td>
</tr>
<tr>
<td>Hematocrit (Hct)</td>
<td>43.2%</td>
<td>35.6% - 45.4%</td>
</tr>
<tr>
<td>Platelets</td>
<td>24.3 × 10⁴/µl</td>
<td>15.0 - 36.1 × 10⁴/µl</td>
</tr>
<tr>
<td>White blood cells</td>
<td>5650/µl</td>
<td>3040 - 8540/µl</td>
</tr>
<tr>
<td>CRP</td>
<td>8.53 mg/dl</td>
<td>↑ Less than 0.3 mg/dl</td>
</tr>
<tr>
<td>APTT</td>
<td>51.3 sec</td>
<td>-</td>
</tr>
<tr>
<td>PT-INR</td>
<td>1.46</td>
<td></td>
</tr>
<tr>
<td>ASO</td>
<td>50.8 IU/ml</td>
<td></td>
</tr>
<tr>
<td>RF</td>
<td>7.4 IU/ml</td>
<td></td>
</tr>
<tr>
<td>HbA1c</td>
<td>6.8%</td>
<td>↑</td>
</tr>
<tr>
<td>ALP</td>
<td>299 IU/l</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Orthopantomography at the initial visit. Coarsening of the trabecular pattern of the left condyle was observed.

soft-tissue swelling involving the preauricular region, a poorly marginated abscess surrounding the left condyle, a mixture of bone lysis and sclerosis of the left condyle, and bone sclerosis surrounding the left lower second molar tooth (Figure 3). A diagnosis of septic arthritis of the left TMJ was made.

He was treated with oral Faropenem at 450 mg daily, but CRP increased to 11.0 mg/dl three days after the initial visit. He was hospitalized and treated with intravenous administration of cefazolin at 2 g and clindamycin at 1.2 g daily for six days. Propionibacterium species and Veillonella species grew in a culture of the joint aspirate (Figure 4), but there was no apparent source of infection with the exception of asymptomatic bone sclerosis surrounding the left lower second molar tooth. Although concentration of 99 mTc was recognized in the thoracic spine and cervical spine by whole body bone scintigraphy on the ninth hospital day, an orthopedic specialist decided that it was unrelated to the cause of infection.
Figure 3. CT images at the initial visit: (a) (b) diffuse soft-tissue swelling involving the preauricular region and a poorly marginated abscess surrounding the left condyle, (c) a mixture of bone lysis and sclerosis of the left condyle, and (d) bone sclerosis surrounding the left lower second molar tooth.
After acute infectious symptoms had passed on the seventh hospital day, the patient was treated with oral amoxicillin at 750 mg daily for eight weeks and was instructed to do jaw opening exercise. The patient was discharged on the 11th hospital day. After three months of hospital discharge, the patient had no symptom of swelling, redness and trismus (Figure 5).

3. Discussion

Septic arthritis of the TM joint most often occurs in male adults, but it has been reported in infants and children [1] [8] [9] [10]. The most common presenting complaints in septic arthritis of the TMJ are trismus and pain, although swelling, tenderness, erythema and malocclusion with ipsilateral posterior open-bite have also been reported [2] [7] [8]. Patients may present malaise and fever. The serum leukocyte count may be normal or increased, and CRP level is a good indicator of disease severity [6] [10]. However, a diagnostic delay problem was reported and the reasons were discussed [1] [6] [10]. Local inflammatory signs of septic arthritis of the TMJ are nonspecific and might be insidious because of the anatomic location of the TMJ deep to the parotid gland and the masseter. Systemic manifestations might be few and widespread antibiotic usage for unrelated conditions can cure some early but undiagnosed cases. In the present case, local findings including trismus, tenderness and edema were not severe and were nonspecific, and systemic inflammatory signs such as fever, leukocytosis and tachycardia were absent, though there was considerable elevation of CRP, and CRP level was a good indicator of disease severity.

In the differential diagnosis of septic arthritis of the TMJ from other diseases, findings of CT and/or MRI play a key role because CT and MRI scans visualize bone and soft tissue with excellent resolution and are noninvasive [8]. In the present case, the abscess surrounding the left condyle and a mixture of bone lysis and sclerosis of the left condyle on CT images were decisive in diagnosing septic arthritis of left TMJ.
There are three routes of bacteria to the TMJ: hematogenous dissemination from a distant site, local spread and direct inoculation [5] [6] [7] [8] [9]. The TMJ might be inherently vulnerable to hematogenous dissemination from a distant site because the high vascularity of its synovial membrane allows greater exposure to bacteria [11]. Contiguous spread of infection is common after dental procedures [6] [11], parotiditis, mastoiditis or otitis [12]. Direct inoculations occur secondarily to arthrocentesis, arthroscopy or acupuncture [13].

Risk factors for the development of septic arthritis can be divided into local and systemic factors [9]. Local factors include blunt trauma, previous joint disease (osteoarthritis, internal derangement), and burn wounds. In patients with these local factors, alteration of the joint architecture and formation of a hematoma might predispose the TMJ to infection. Systemic factors include autoimmune diseases, diabetes mellitus, medications such as steroids or immunosuppressants, and sexually transmitted diseases, which are related to compromised immune systems. However, the source of infection sometimes remains unknown as in the present case.

Staphylococcus aureus, Staphylococcus saprophyticus, Neisseria gonorrhoea, Streptococcus viridans, and Haemophilus influenzae have been reported as common infecting organisms in septic arthritis of the TMJ [1] [8] [10]. In our case, however, Propionibacterium species and Veillonella species were identified by culture of the joint aspirate. Propionibacterium species are Gram-positive anaerobic bacteria and are part of the natural microbial flora of the skin, urogenital tract and intestine. Veillonella species are Gram-negative anaerobic bacteria and have been frequently isolated from human oral cavities.

Irrigation and drainage, antibiotic therapy, and joint rest have been recommended for the treatments of septic arthritis of the TMJ in previous reports. Several studies have shown positive results from arthrocentesis for irrigation and drainage of the joint space [6] [7] [8]. Empiric antibiotic therapy should be initiated immediately after diagnosis, and appropriate modifications to the antibiotic regimen should be made after gram stains and cultures of the joint aspirate. During the acute phase of infection, the TMJ should be rested. Jaw opening exercise should be started after the acute phase of infection has passed [1] [9].

Although most patients with septic arthritis of the TMJ have complete recov-
ery after treatment, possible complications should be considered [5]. Since delayed treatment of septic arthritis can result in serious complications, including dissemination of infection, joint dysfunction, growth disturbances, fibrosis, and ankyloses [1] [2] [3] [4], clinicians should include septic arthritis of the TMJ in the differential diagnosis of preauricular pain, trismus and swelling if there was no apparent source of infection.

4. Conclusion

We report a case of septic arthritis of the TMJ without an apparent source of the infection. To avoid serious complications, septic arthritis of the TMJ should be considered in all patients with preauricular pain, trismus and swelling.

References


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