

Case Report TMJ Disorders

Septic arthritis of the temporomandibular joint managed with arthroscopy: a case report

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Abstract. Septic arthritis of the temporomandibular joint (SATMJ) is an uncommon bacterial or fungal infection of the joint space. A 68-year-old man with underlying diabetes mellitus and a history of liver transplant, who was on immunosuppressants, presented to the oral and maxillofacial surgery department of the authors' institution in Portugal. His main symptoms were arthralgia in the right temporomandibular joint, malocclusion, pre-auricular swelling and erythema. After clinical, laboratory, and imaging evaluations, diagnoses of chronic suppurative otitis media and SATMJ were made. The patient was managed with arthroscopy of the right temporomandibular joint, which allowed joint fluid collection for microbiological examination, lavage, and biopsy. The biopsy sample was positive for *Pseudomonas aeruginosa*. After surgery, targeted intravenous antibiotic treatment (amikacin) was given for 30 days. No recurrence of any complaints was reported after 12 months of follow-up.

Keywords: Septic arthritis; Temporomandibular joint; Arthroscopy; Anti-mycobacterial agent; Microbial sensitivity tests.

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Septic arthritis of the temporomandibular joint (SATMJ) is a relatively uncommon bacterial or fungal infection of the joint space that can result in significant functional impairment.^{1–3} The established aetiology is either haematogenous dissemination or contiguous spread, with the most common pathogens being *Staphylococcus aureus*, *Streptococcus spp.*, and

Pseudomonas aeruginosa.^{2,4–6} Potential risk factors include otitis media, blunt trauma, systemic or autoimmune diseases, and iatrogenesis.^{5,6}

Due to its infrequency, SATMJ can be misdiagnosed and is often confused with internal derangement, osteoarthritis, and/or autoimmune diseases with temporomandibular joint (TMJ) involvement.^{4,5,7} Fever, pain, swelling,

tenderness, malocclusion, and restricted mouth opening are the typical signs and symptoms of SATMJ.^{4,7,8} Anti-mycobacterial treatment and surgical drainage are commonly used and effective treatment approaches, depending on the patient's condition.^{2,7} Failure to promptly treat SATMJ may result in ankylosis, condylar resorption, and joint destruction.^{1,6}

This report, describing a case of SATMJ that was initially interpreted as a severe ear infection, aims to highlight the importance of early diagnosis and appropriate treatment in SATMJ.

Case report

A 68-year-old man with underlying diabetes mellitus and a history of liver transplant, who was on immunosuppressants, presented to the oral and maxillofacial surgery department of a medical centre in Portugal - Instituto Português da Face. The patient's symptoms had persisted and worsened despite the multiple courses of antibiotic therapy.

Clinical examination revealed swelling, erythema, and tenderness in the right pre-auricular area, maximum mouth opening (MMO) limited to 33 mm, and a right posterior open bite. Leukocytosis, neutrophilia, and an elevated C-reactive protein level were

identified in recent laboratory analysis. Imaging investigations were performed, including both magnetic resonance imaging (MRI) and computed tomography (CT). MRI revealed a diffuse effusion in the right TMJ and mastoid cells, and a suspicious disc perforation, and swelling of the surrounding soft tissues was also evident (Fig. 1). The CT showed severe erosive bone damage of the right condyle, total opacification of the middle ear with normal pneumatization of the mastoid, and tympanic membrane perforation (Fig. 2).

After clinical, laboratory, and imaging evaluation, provisional diagnoses of chronic suppurative otitis media and SATMJ were made. The patient was recommended to undergo right TMJ arthroscopy for joint fluid collection and microbiological examination with joint lavage, under general anaesthesia. The fluid collected (approximately 1.2 ml) was turbid and semi-

transparent. After fluid collection, massive lysis and lavage of the upper joint compartment was performed with 1000 ml of Ringer's lactate. The arthroscopy revealed a degenerated joint with a lateral/posterior disc perforation. A retrodiscal biopsy was performed for suspected *Mycobacterium tuberculosis*. Both the collected joint fluid and the biopsy sample were sent for microbiological analysis. The patient made a good recovery, and an improvement in his clinical symptoms was observed after 2 days.

Microbiological examination of the joint fluid was negative; however, *Pseudomonas aeruginosa* was isolated from the biopsy sample. Antibiotic sensitivity testing revealed sensitivity to amikacin. The patient's antibiotic treatment was adjusted in accordance with the latest guidelines for antimicrobial treatment,⁹ and the patient was given intravenous amikacin (15 mg/kg/day) for 30 days, with symptoms

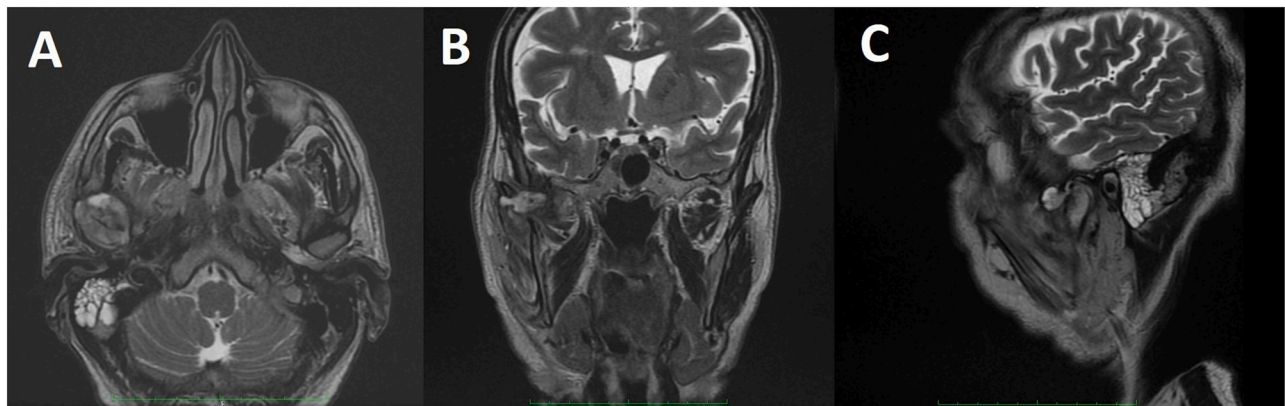


Fig. 1. Preoperative axial (A), coronal (B), and sagittal (C) T2-weighted MRI images showing diffuse effusion in the right temporomandibular joint, with involvement of the mastoid cells. A suspicious disc perforation and swelling of the surrounding soft tissues are also evident.



Fig. 2. Preoperative sagittal (A), coronal (B), and three-dimensional temporomandibular joint reconstruction (C) computed tomography images showing severe erosive bone damage of the right condyle, partial opacification of the middle ear with normal pneumatization of the mastoid, and signs of tympanic membrane perforation.

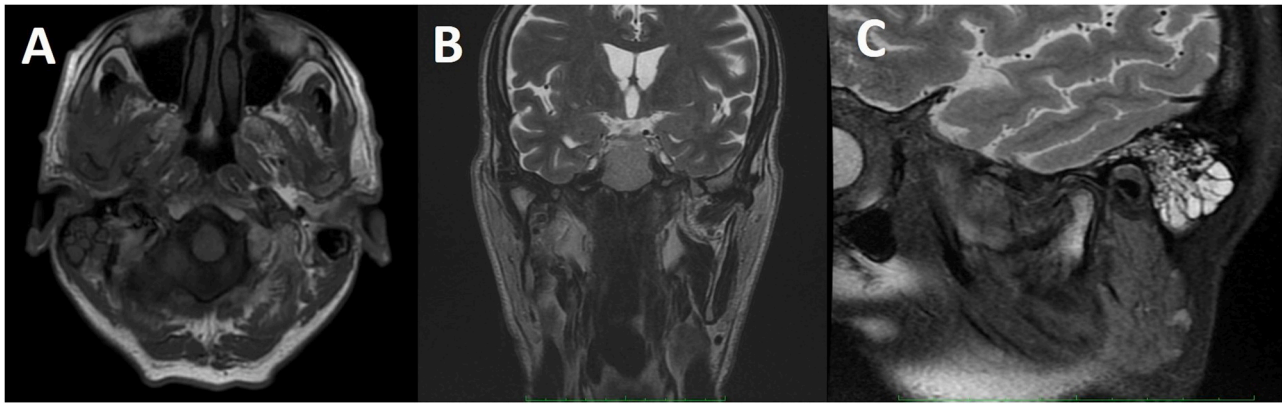


Fig. 3. Postoperative axial (A), coronal (B), and sagittal (C) T2-weighted MRI images showing an improvement in the joint effusion. Mastoid cells maintained effusion.

improvement (VAS pain score 0/10; MMO 42 mm). Postoperative MRI showed an improvement in the joint effusion and inflammation of the surrounding tissues (Fig. 3). No recurrence of any complaints was reported after 12 months of follow-up.

Discussion

This case of SATMJ highlights the challenges of obtaining a correct diagnosis. From the perspective of an otorhinolaryngologist, this patient had adult-onset chronic suppurative otitis media. It was chronic because the signs and symptoms had been present and had progressed over the course of more than 3 months, and was suppurative due to repeated episodes of otorrhoea with tympanic membrane perforation. The most relevant sign for its onset in adulthood is given by the normal pneumatization/development of the mastoid.^{10,11}

At first, direct spread of the infection from the middle ear to the TMJ was considered to be the cause of the patient's SATMJ.⁸ However, further analysis showed more evidence supporting secondary involvement of the ear by SATMJ extension: (1) no signs of bony erosion in the temporal bone CT scan, but erosion of the right condyle instead; (2) lack of clinical signs of mastoiditis such as post-auricular pain, retro-auricular swelling and erythema, and an outwardly displaced pinna; (3) SATMJ being reported as a complication of acute otitis media rather than chronic otitis media; (4) bony destruction centred in the right condyle with infection extending anteriorly and posteriorly (to the ear). Overall, haematogenous

spread was considered the most likely aetiology in this case of SATMJ in a patient with diabetes mellitus and immunosuppression, with secondary involvement of the surrounding tissues, including the middle ear.^{3,4,7} Microorganisms can reach the TMJ region most commonly by haematogenous spread, due to the high vascularity of the synovium and the lack of a basement membrane, increasing the likelihood of exposure to pathogens.²

Synovial fluid analysis is considered essential to confirm a diagnosis of SATMJ, allowing the identification of the aetiological agent. Joint aspirate should be examined for colour and turbidity as indicators of infection, and sent for culture analysis, Gram stain, and sensitivity testing.⁶ Commonly isolated pathogens include *Staphylococcus spp*, *Streptococcus spp*, *Haemophilus influenzae*, and *Pseudomonas aeruginosa*.^{2,4} In this case, the fluid analysis was negative, and only the biopsy could provide an accurate identification of the microorganism – a surprising finding for the authors. This case highlights a double approach with joint fluid and biopsy sample analysis, which is only possible with TMJ arthroscopy.

To date, there is still no consensus on the management of SATMJ. However, this case report shows the positive impact of TMJ arthroscopy in the diagnosis and treatment of SATMJ. Immediate empirical antibiotic therapy is recommended when SATMJ is suspected, and this should subsequently be tailored according to the culture and sensitivity results.⁴ The best treatment approach must be selected according to the degree of joint involvement and the experience of the surgical team, bearing

in mind two important concepts: intra-articular aspiration and lavage of the septic contents decreases the bacterial load and limits joint damage (arthrocentesis, arthroscopy, and arthrotomy have been described)^{7,8}; accurate identification of the microorganism is mandatory for targeted antibiotic treatment. Acute inflammatory markers are often helpful in determining ongoing SATMJ. Laboratory findings such as leukocytosis, neutrophilia, or elevated C-reactive protein levels may be evident during the acute stage of SATMJ.^{1,8}

In the case presented here, systemic risk factors including diabetes mellitus and immunosuppression could have contributed to the haematogenous spread resulting in septic arthritis of the TMJ. Detailed patient history and clinical findings, and their correlation with imaging findings and laboratory tests, are imperative to establish a correct diagnosis and develop an effective treatment plan for septic arthritis of the TMJ.^{1,3} Synovial fluid analysis and TMJ arthrocentesis are sometimes insufficient for a definitive diagnosis, and TMJ arthroscopy with biopsy of suspected areas can improve the diagnosis and treatment. Complications of septic arthritis of the TMJ often have a significant impact on quality of life, which makes prompt management of the utmost importance to improve the prognosis of this disease.⁷

Ethical approval

Not required.

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Competing interests

None.

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Patient consent

The patient provided written informed and free consent for the publication of this report, in accordance with current legislation.

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