

A rare case of unilateral psoriatic arthritis of the left temporomandibular joint: MRI and CBCT findings

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ABSTRACT

Psoriatic arthritis (PsA) of the temporomandibular joint (TMJ) is a rare type of inflammatory arthritis. We present a 21-year-old male diagnosed with psoriasis six years ago. Inflammatory autoimmune arthritis was diagnosed. TMJ involvement comprised arthralgia, degenerative joint disease, joint pain, limited range of jaw movements, and crepitus. Biomarkers revealed a C-reactive protein of 0.14 mg/L and seronegative inflammation with negative rheumatoid factor. At imaging important left condyle morphology derangements with erosions, decreased subchondral bone fat signal, condyle edema, osteophytes, and periosteal apposition, and loss of the normal disk position and morphology were present. The particularity of this case is given by the rapid onset of psoriasis arthritis with negative rheumatoid factor in a young male and juxta-articular new bone formation. The treatment plan comprised anti-inflammatory drugs, methotrexate, and folic acid, aimed for the general disease, and an occlusal splint, aiming for the relief of the TMJ symptoms.

Keywords: psoriasis, arthritis, temporomandibular joint, magnetic resonance imaging

List of abbreviations

CBCT cone beam computed tomography

DMARD Disease-modifying anti-rheumatic drug

GRAPPA Group for Research and Assessment of Psoriasis and Psoriatic Arthritis

ILAR International League of Associations for Rheumatology

JPsA Juvenile PsA

MRI magnetic resonance imaging

NSAID non-steroidal anti-inflammatory drug

PsA Psoriasis arthritis

TMJ Temporomandibular joint

TMD Temporomandibular Disorder

VAS Visual assessment scale

INTRODUCTION

Psoriasis is a multifaceted disorder connected to a severe disease burden and significant comorbidities. Recently, the Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) recommendations for treatment were created to support the most recent developments of psoriatic cases management [1]. A personalized medicine strategy for psoriasis patients, along with standard therapy, restoring the altered gene expression levels

could be a tool to cease the progression of psoriasis [2]. Chronic inflammatory arthritis associated with psoriasis is referred to psoriatic arthritis (PsA).

Temporomandibular joint (TMJ) involvement in PsA is rare, and the symptoms are comparable to those of rheumatoid arthritis [3]. Lee E.Y. et al., investigated MRI findings of juvenile PsA in various joint locations and reported joint space narrowing, mandibular condyle abnormalities (erosions, osteolysis, or changes in condyle shape), and synovial

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abnormalities (thickening and augmentation), similar to other joint alterations, were the most often observed abnormalities in TMJ. Furthermore, bone marrow and a little joint effusion were observed [4].

To the best of our knowledge, there have not been previously reported male cases aged under 20 years, of PsA with recurrence of typical psoriasis lesions, peripheral oligoarthritis affecting just one peripheral joint, no nail involvement or dactylitis, no spine derangements as an axial inflammation, seronegative for rheumatoid factor, and unilateral TMJ inflammatory process with severe bone and disc destruction and associated juxta-articular bone production, benefiting from both cone beam computed tomography (CBCT) and MRI as the combined panel of imaging.

CASE REPORT

A 21-year-old male patient, diagnosed with psoriasis six years ago, with negative psoriatic family history, and treated by topic administration of corticosteroids, in partial remission until seven months ago, when multiple psoriatic plaques appeared, was referred to our department due TMJ impairment.

In history he described a presentation to the otolaryngology department for left ear pain, non-confirming an ear source of pain. He presented to rheumatology department, for multiple pain locations, left temporomandibular joint pain of about 5 months, right ankle pain of about 2 months, and pain and swelling of the bilateral 3rd metatarsophalangeal joints, installed a month ago. Inflammatory autoimmune arthritis was diagnosed, and anti-inflammatory medication was prescribed.

At presentation in our department, by the complete physical examination, psoriasis plaques were noticed on the back, legs, and scalp (Figure 1).

TMJ involvement was evaluated according to the research diagnostic criteria for temporomandibular disorders, described by Schiffman et al., as arthralgia (ICD-9 524.62; ICD-10 M26.62) and degenerative joint disease [5]: joint pain, affected by jaw movement and function, testing of the TMJ determining pain occurrence (visual assessment scale (VAS) scale 8/10), limited jaw movements, limited propulsion, mouth opening with 3 mm deviation to the left side, limited right lateral movement and joint sounds (crepitus).

Intraoral examination revealed the presence of dental caries, composite fillings, tooth loss, enamel demineralization, modified mandible arch shape, class II Angle relationships and coincident midlines.

C-reactive protein of 0.14 mg/L and seronegative inflammation with negative rheumatoid factor were found in the biomarkers.

Imaging of the TMJ was performed consisting in functional TMJ magnetic resonance imaging (MRI) and cone-beam computed tomography (CBCT). At MRI examination, right TMJ showed minimal disc displacement with reduction (Figure 2), no morphological modification.

The left TMJ showed important condyle morphology derangements, condyle shape modification, multiple erosions, loss of the condyle cortical bone inside the joint, decreased subchondral bone fat signal, presence of edema inside the condyle, and absence of the normal disk position and morphology, with only a disk fragment present, located posteriorly, having visible posterior attachment. Functional impairment was present, with reduced range of jaw movement (Figures 3 a, b). No loss of bone delineation was detected at the level of the glenoid fossa, nor joint effusion. Still, inflammatory edema was present inside the left temporal bone articular tu-



a. b.
FIGURE 1. Psoriasis plaques: a. on the back and b. on both legs

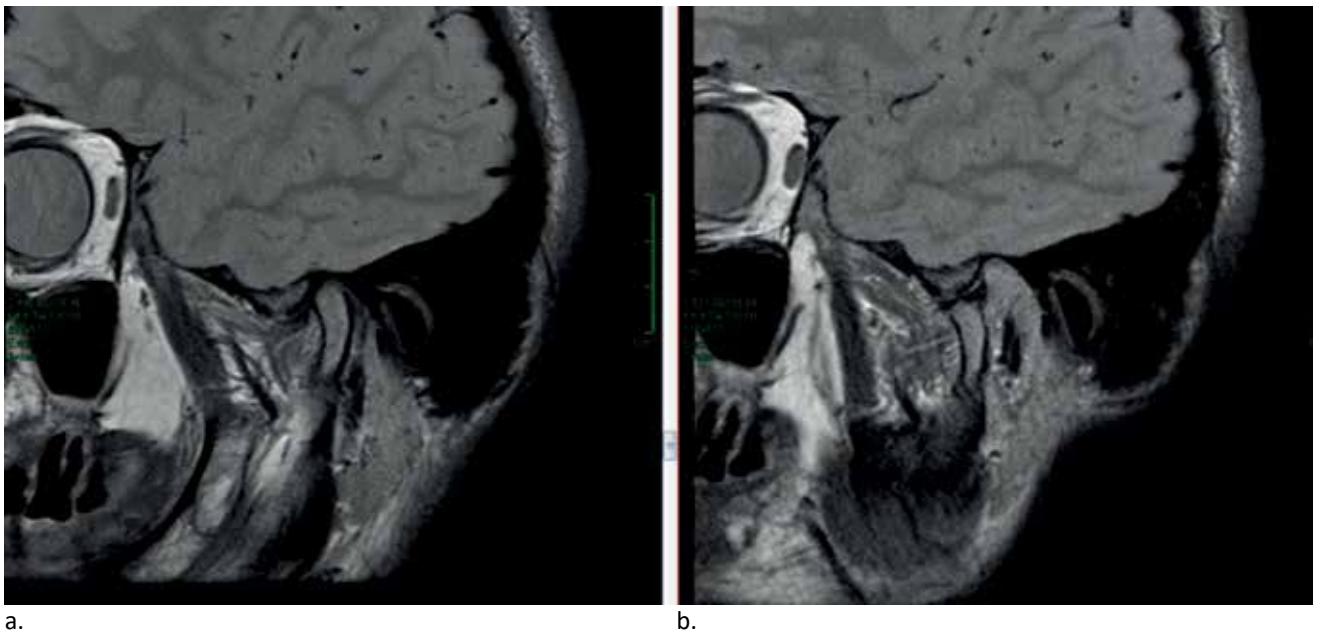


FIGURE 2. MRI Sagittal PD weighted images of the right TMJ. a. Closed mouth showing slight anterior disk position b. Reduction to normal position on open mouth

bercle, left condyle, joint capsule, and the left lateral pterygoid muscle.

For better evaluation in multiple planes of the bone modification, the imaging panel was completed by adding CBCT examination that revealed degenerative joint bony surfaces of the left TMJ (ICD-9 715.18; ICD-10 M19.91) [5], showing the left condyle positioned anteriorly in the fossa with a modified irregular shape, lack of cortical delineation by bone erosion, with supplemental bone productions, such as osteophytes and periosteal apposition. Also, it was noted a presence of high-density structure inside the joint space, posteriorly located, corresponding to the modified disk fragment seen on MRI. The cortical bone of the glenoid cavity was unimpaired (Figures 4 a, b, 5 a, b).

Comparative assessment of both TMJs is presented in Figure 6, showing joint capsular inflammatory densification of the left joint. No obvious right TMJ modifications were encountered on CBCT.

Evaluation of the TMJ according to CASPAR criteria [6]: psoriasis, juxta-articular new bone formation, arthritis with negative rheumatoid factor, confirmed the PsA diagnosis.

The treatment plan comprised in anti-inflammatory drugs administration, methotrexate, and folic acid, aiming the general disease, and supplemented with an occlusal splint, aiming the relief of the TMJ symptoms.



FIGURE 3. MRI sagittal PD weighted image of the left TMJ. a. Closed mouth. Partial destruction of the condyle process, modified disk position (posteriorly). b. Open mouth. Reduced range of movement with the condyle still present in the joint cavity

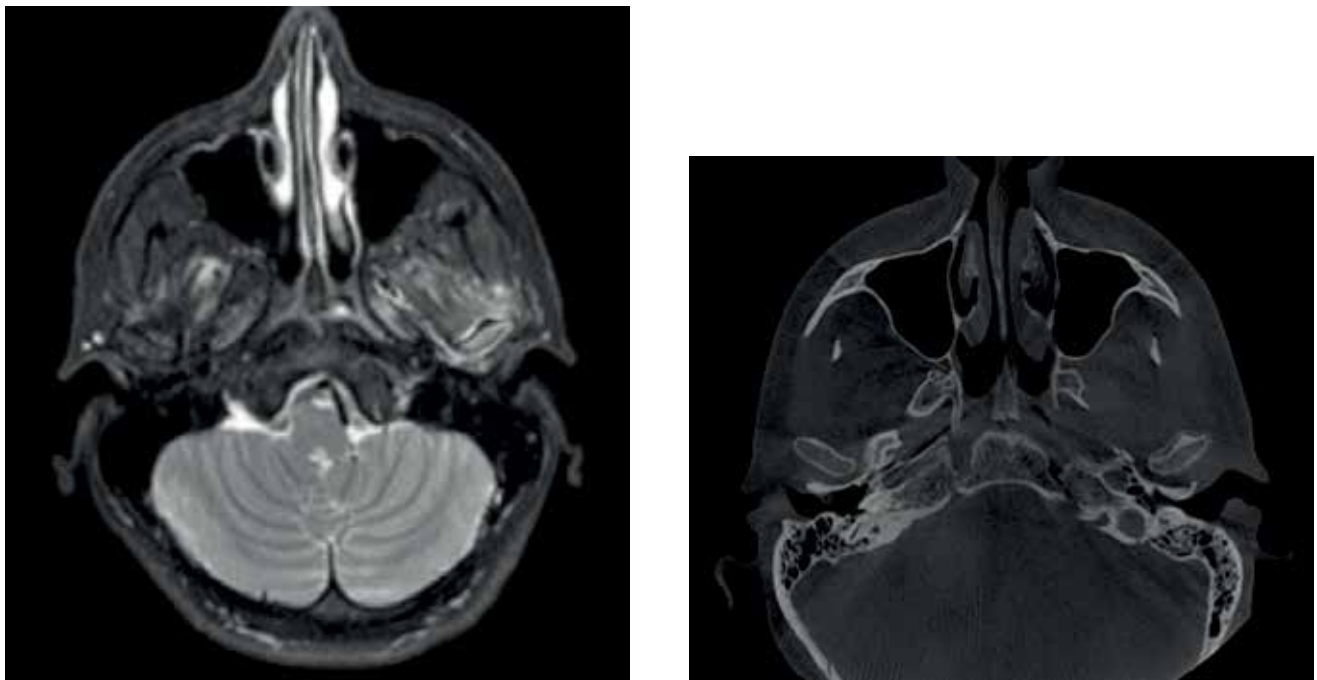


FIGURE 4. a. MRI axial Propeller T2WI. Left TMJ with temporal and condylar bone edema, present also in the joint synovial tissue and adjacent lateral pterygoid muscle. b. CBCT axial section. Left TMJ with inflammatory capsular densification



FIGURE 5. a. CBCT individualized oblique sagittal section of the left TMJ. Important condylar cortical erosion, and the presence of a density posteriorly located in the joint. Normal morphology of the glenoid cavity. b. CBCT oblique coronal section of the left TMJ with cortical erosion, subcapsular demoralization, capsular lateral densification, and a dense structure within the joint

DISCUSSION

Psoriatic TMJ arthritis incidence is low, being reported in literature as 4.6% [7]. In patients with psoriasis, overall PsA pooled prevalence was reported as 19.7%, being 3.3% in children and adolescents and 21.6% in adults [8]. However, TMJ PsA prevalence was not reported separately. In the literature there are no more than 50 cases documented, with the Wang et al. study from 2014 collecting data of previous case reports and few more added ever since [9]. Wang et al. reported a slight male predilec-

tion and an average age of 43 years for the onset of TMJ disorder symptoms, age ranging between 30-50 years [9]. Even so, reported later cases were mostly women, with the TMJ symptoms onset between 40-77 years of age [3], [7].

As an autoimmune inflammatory disease, psoriasis can affect the synovial joints in addition to the skin manifestation. The patient we presented had a recurrence of psoriasis typical lesions, peripheral oligoarthritis involving one single peripheral joint, 3rd metatarsophalangeal joint, no dactylitis or nail

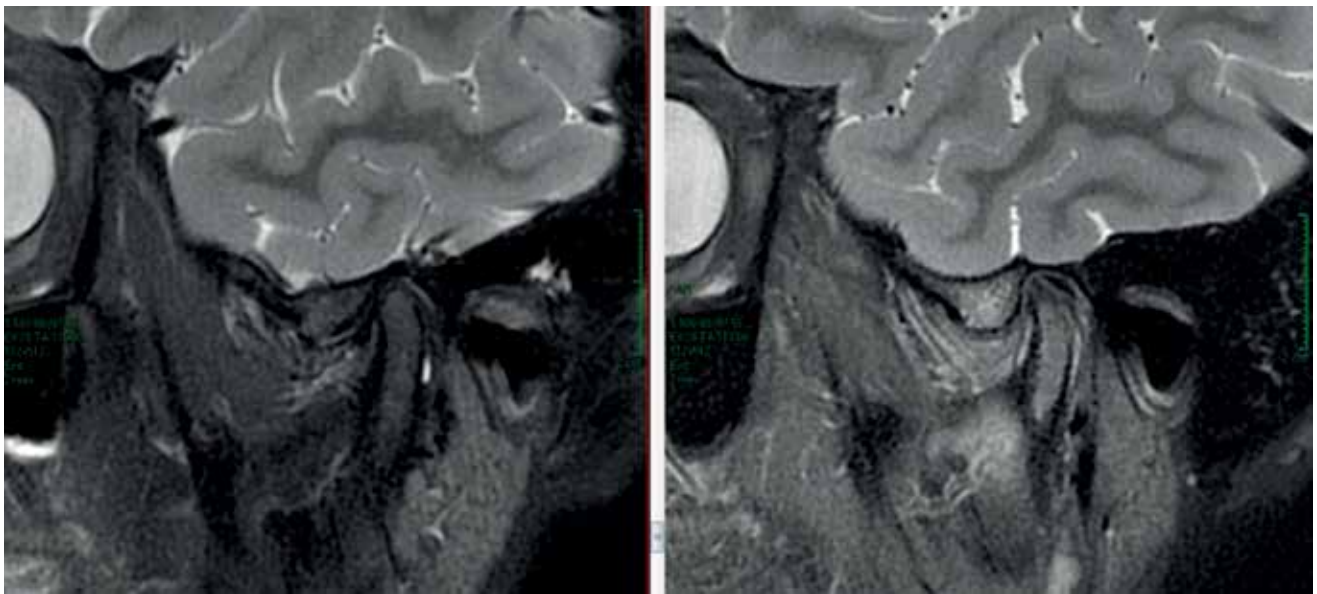


FIGURE 6. MRI Propeller T2 WI. Sagittal comparative images of both TMJ. a. the right TMJ, b. the left TMJ, showing the bone edema present in the temporal eminence and condyle also associating edema in the muscle adjacent to the joint

involvement, no spine derangements as an axial inflammation, seronegative for rheumatoid factor and unilateral TMJ inflammatory process with severe bone and disc destruction, associating juxta-articular bone production. The symptoms were mild and seemed to have appeared in a short amount of time, with onset before the age of 20 years.

A differential diagnosis with juvenile PsA (JPsA) was made based on International League of Associations for Rheumatology (ILAR) criteria. Patients defined as having JPsA, within the ILAR classification, must have a persistent arthritis of greater than 6 weeks with onset of the arthritis prior to age 16 and either the presence of a psoriatic rash, or in the absence of rash, at least 2 of the following minor criteria: first degree relative with psoriasis, nail pitting or onycholysis, and dactylitis [1]. In our presented case, the patient denies a family history, arthritis was installed one year ago (around the age of 20), and no nail pitting or dactylitis was found on clinical examination.

When combined with the historical context and imaging that revealed the severity of TMJ arthritis modifications that were not consistent with the symptoms, the diagnosis of TMJ PsA was made. In comparison to osteoarthritis, which typically has erosion more centrally located, PsA can affect all surfaces including the joint periphery [9]. In terms of symmetry, considering that in PsA typically unilateral asymmetrical involvement of the peripheral joints is present, in TMJ PsA, the disease was encountered both bilaterally and unilaterally, with slightly more number of unilateral cases [9]. In the presented case TMJ arthritis was unilateral and con-

tralateral (right) TMJ showed normal morphology, with slight anterior disk displacement on closed mouth view that reduced to the normal position on the open mouth functional MRI images.

The rapid onset of psoriasis arthritis in a young male with negative rheumatoid factor and juxta-articular new bone formation rendered this case unique. MRI was useful in detection of the degree of destruction of joint anatomical structures because of its high resolution for soft tissue, including a functional view of the joint as well as the disc's position in relation to the joint surfaces, the amount of joint effusion, and the limitations of the joint movement. Furthermore, it enabled evaluation of the involvement at synovial level of as well as the edema extension into the pterygoid muscle. This helped establishing the best treatment plan and providing an unbiased way to monitor the progress of the patient and accurately assess the treatment's success.

By allowing for more precise sectioning in the TMJ planes, CBCT was a very useful tool for assessing the size of the joint space and its asymmetrical narrowing as well as the degree of erosion and osteophyte production, being a great clinical value for diagnosis. It provided a proper image of the erosion of cortical bone, condyle flattening, and inflammatory changes.

Treatment of PsA, according to Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) 2021 recommendations, depends on the affected joints, the grade of severity and activity of inflammatory process, other present comorbidities and if possible, it is recommended to target multiple domains [9]. Disease-modifying an-

ti-rheumatic drugs (DMARDs) and non-steroidal anti-inflammatory drugs (NSAIDs) are the most common medication recommended for relieve pain and reduce inflammation. In case of our patient, a conventional therapy consisted in NSAIDs, and methotrexate was considered. Given the paucity of data on oligoarticular PsA existing in the literature, there are no specific indications for the therapy and a patient's particular requirements as well as the unique characteristics of each treatment should be considered [10]. Methotrexate is the most used second-line medication in patients with polyarticular or persistent oligoarticular patients and it was introduced in the treatment of our patients after the onset of TMJ PsA.

A supplementary occlusal splint was recommended aiming the relief of the TMJ symptoms and to improve the mandibular movements. As a result of the few cases that have been reported, the TMJ PsA risk of developing ankylosis must be brought to the clinician's attention, and treatment must be combined with an appropriate, careful follow-up [9].

When the affected joint is the temporomandibular joint, especially after a period of remission of the classical psoriatic manifestation, establishing the diagnosis can be a challenge for the practitioner, since the patient may pass along several specialties, as in

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our case getting from the otolaryngologist to the orthodontist. The etiology and pathology remain controversial, clinical symptoms differ in patients, the rarity of the TMJ PsA and non-specific lesions make it difficult to diagnose. When the psoriasis is not yet clinically evident or even when the disease was not severe and the patient is in remission and failed to mention it in history, it can be difficult to diagnose TMJ PsA. A patient's quality of life can be improved by collaboration between specialties. [1]. The use of non-steroid anti-inflammatory drugs, topical drugs as well as injecting glucocorticoids

CONCLUSIONS

In conclusion, in treating a patient with unilateral TMJ dysfunction, the dental practitioner should consider a thorough clinical general examination as well as a complete medical history, keeping in mind the possibility of joint involvement associated to an autoimmune disorder, such as psoriasis. Therefore, when considering TMJ PsA, to determine the severity of the inflammatory process and effectively treat the disease, a comprehensive diagnostic imaging approach is necessary. Considering the different phenotype of PsAs, reconsidering the psoriasis treatment is essential and a customized strategy is advised.

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