Temporomandibular Joint Pain; An Unusual Initial Manifestation of Rheumatoid Arthritis

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ABSTRACT

We give a report on a 39-year-old housewife who experienced temporomandibular joint pain for almost a month, followed by symmetrical polyarthritis of the hands' small joints, an uncommon early sign of rheumatoid arthritis. It is important to have a high index of suspicion and make an early referral to a rheumatologist for any patient presenting with isolated, unexplained temporomandibular joint pain, as a raised acute phase reactant such as erythrocyte sedimentation rate (ESR) is a very helpful indicator of probable underlying inflammatory arthritis.

INTRODUCTION

One of the most prevalent chronic inflammatory autoimmune illnesses, rheumatoid arthritis (RA) primarily affects the body's small and large joints, typically exhibiting a symmetric pattern of symptoms.[1] Its male to female ratio is 1:3, and its global incidence is 1%.[2] The majority of the skeletal system is impacted, which causes symptoms that are common in the early stages of rheumatoid arthritis. If addressed, these symptoms can result in bone erosions, numerous joint degeneration, a lower quality of life, and other comorbidities.[3] Although they typically appear later in the disease, extra-articular symptoms such interstitial lung disease and subcutaneous nodules can also occur.[2,3] Even though the disease's diagnosis and prognosis have improved recently, there are still some gaps in non-rheumatologists' diagnoses of it in other fields, particularly when the presentation is unusual, as in this index case, which began with temporomandibular joint (TMJ) pain as the primary symptom.

CASE REPORT

Mrs. HA, a 39-year-old homemaker, arrived at the rheumatology clinic with a two-month history of wrist discomfort and oedema in

addition to bilateral proximal interphalangeal joints pain in her second, third, and fourth fingers. She complained of pain in her right jaw that had been present for three months. When over-the-counter pain killers failed to relieve her right jaw ache, she claimed that she had subtle jaw soreness that got worse after biting with her right upper and lower molar teeth. There was trouble opening the mouth because of pain, inflammation, and sporadic headaches. The oral surgeon's review indicated that the patient experienced tenderness in both of her temporomandibular joints (TMJs), with the right one being more so. Reduced mouth opening was seen, and plain radiographs of both TMJs were taken with the mouth closed and open, revealing erosions of the mandibular condyles. Her white cell count was 6.5 x 10^9/L, her platelet count was 442 x 10^9/L, her haemoglobin was 9.8 g/dl, and her high ESR was 68 mm/hr. Anaemia from peripheral blood film was normocytic normochromic. The oral surgeon made an impression of bilateral temporomandibular joint inflammatory disease in a young woman.

Following, Mrs. HA was prescribed antibiotics and non-steroidal anti-inflammatory medicines (NSAIDs) as analgesics. She was instructed to come back for a review in a month. She began experiencing hand joint pain and swelling while she was at home, along with early morning stiffness that lasted for many hours. She had to be referred to our specialty clinic for additional assessment as a result of this.

Our review revealed that both TMJs were painful prior to the development of symmetrical polyarthritis in the hands' tiny joints. There were no signs of Raynaud's phenomenon, proximal muscle weakness, sicca symptoms, mucosal ulcers, skin rashes, or subcutaneous lumps in conjunction with the condition. Additionally, there was no history of deep vein thrombosis, stroke, neck or back pain, or recurrent abortions. But there was also occasional tiredness and low-grade fever with no other constitutional symptoms.

EXAMINATION

Patient appeared as pale and in moderate to severe painful distress, anicteric with no significant lymphadenopathy. Vital signs: Pulse rate - 92beats/ minute, Blood pressure - 110/80mmHg, and heart sounds S1 and S2, respiratory and gastrointestinal system exams were all normal. Musculoskeletal exam disclosed bilaterally tender TMJ's, with crepitus on movement, tender wrists, and tender and swollen 2nd, 3rd and 4th proximal interphalangeal (PIP) joints bilaterally, with incomplete fists of both hands. No obvious finger deformities. Other joints were normal and no subcutaneous nodules.

An assessment of Early Inflammatory Arthritis, plausibly Rheumatoid Arthritis (RA) was made, and a series of investigations were conducted accordingly.

RESULTS OF INVESTIGATIONS

Both quantitative Rheumatoid Factor (RF) and Anti-Cyclic Citrullinated Peptide (Anti-CCP) were elevated at 406 IU/Ml (normal 0 – 15) and 187 RU/mL (negative<5), respectively. Antinuclear antibodies (ANA) titre was <1:100 RU/mL (negative<1:100), ESR was 76mm/1st Hour, while Complete Blood Count (CBC) showed haemoglobin of 9.4g/dl, WBC of 6.2 x 10^9/L, and Platelets were 284 x 10^9/L. Serum Electrolytes, Urea, Creatinine (E, U & Cr) including Liver Function Tests (LFTs) were all within reference limits. Serology for Human Immunodeficiency Virus (HIV), Hepatitis B and C Virus were all negative. Mantoux and plain chest radiograph were all normal. Plain radiograph of the hands showed soft tissue swelling and peri-articular osteopenia, but no erosions.

DIAGNOSIS

The diagnosis of Seropositive Rheumatoid Arthritis of the TMJs and small joints of the

hands was made based on the 2010 American College of Rheumatology/European League Against Rheumatism (ACR/EULAR) criteria[4], and patient was counselled on the diagnosis.

TREATMENT

The patient was initially placed on high doses of oral Prednisolone at 50mg daily, with oral Omeprazole 20mg twice daily for gastro-protection as prophylaxis against steroid-induced gastritis or gastric ulceration. Oral Calcium 500mg twice daily and Vitamin D3 800IU daily were also started as prophylaxis against steroid-induced osteoporosis. Therapy with disease modifying anti rheumatic drugs (DMARD's) was commenced (with oral Methotrexate at a starting dose of 10mg weekly and Hydroxychloroquine 200mg daily) while tapering the dose of prednisolone. Adequate patient education was given. She made three follow up visits at six weekly intervals, with remarkable improvement in her symptoms, and, currently, her disease is in remission. Her maintenance drugs currently include oral Methotrexate (MTX)15mg weekly (with oral Folic acid 10mg a day after Methotrexate dose), oral Hydroxychloroquine sulphate (HCQ) 200mg daily, oral Calcium/Vitamin D3 supplement daily, and oral Prednisolone at 5mg daily. Patient was expected to continue these medications and regular follow-up visits during which her disease activity, physical function as well as CBC/ESR, lipid profile, fasting blood glucose, and LFTs would be assessed regularly to monitor her response to treatment and survey for possible side effects of treatment.

DISCUSSION

Rheumatoid arthritis (RA) is a chronic, multi systemic, autoimmune inflammatory disease, which can affect multiple joints and lead to disability if not diagnosed and managed early, with women more commonly affected than men.[1,2] Arthritis of the temporomandibular joints (TMJs) can occur in various disease conditions such as rheumatoid arthritis, ankylosing spondylitis, psoriatic arthritis and osteoarthritis.[5] Gynther *et al*[6] in a bid to emphasize the frequent involvement of the TMJs in generalized osteoarthritis and rheumatoid arthritis, he analysed the radiographic changes of TMJs in 20 and 21 patients living with osteoarthritis and rheumatoid arthritis respectively. He found 15 (71%) of the RA patients having structural changes, with condylar erosions being the predominant finding. Our patient was also noted to have similar condylar erosions. Being an acute phase reactant, a raised ESR[7] can be a pointer to an underlying inflammatory cause of TMJ pain, as is the case with our patient.

Temporomandibular joint involvement in RA is common.[7] However, involvement is usually later in the course of the disease, unlike in our index case.[7] Symptoms can range from pain to swelling and limitation of joint movement. Prevalence of TMJ involvement in RA range from 19% to 86%.[7-9] Limited data exist for early involvement of TMJ in RA. However, in a longitudinal study by Sem *et al*[10], the prevalence at baseline was 10.6% but it decreased to 3.6% in the first year, which they attributed to the effect of standard treatment with DMARDs. Because it is usually seen late in RA, TMJ joint involvement may pose a diagnostic challenge to the dental surgeon and other clinicians when it presents before the diagnosis of rheumatoid arthritis is established.[11,12] This challenge was demonstrated in our patient. With the asymptomatic nature of TMJ involvement, degenerative changes can take place long before they are seen with radiological imaging.[13] While conventional X-rays only visualize late signs of preceding disease in RA, evidence has shown that superior imaging modalities like high resolution ultrasonography (HRUSS) or magnetic resonance imaging (MRI) are more sensitive in detecting early inflammatory and destructive lesions like synovitis,

tenosynovitis, bone marrow oedema, and erosions in RA[14], and would have been more useful when imaging the hands in our index patient, but these are not readily available in our centre. Furthermore, evidence has demonstrated clear benefit with better outcomes and higher chances of achieving quick remission with early diagnosis prompt referral and commencement of treatment with DMARDs in RA.[15]

A study by Lordache *et al* [16] found a significant correlation between TMJ involvement, disease activity, and disability in 152 and 55 patients living with RA and ankylosing spondylitis respectively who have TMJ involvement. Temporomandibular involvement was also a major cause of poor quality of life in patients with RA.[17]

The diagnosis of RA in our patient was made after the appearance of symmetrical polyarthritis of small joints of the hands using the 2010 ACR/EULAR criteria[4] with the domains of joint count, immunologic markers (i.e., RF and Anti-CCP), acute phase reactants (i.e ESR), and disease duration scoring 5, 3, 1 and 1 respectively, giving a total ACR/EULAR score of 10. A minimum score of 6/10 is required for the diagnosis of definite RA using these criteria. The 2021 American College of Rheumatology (ACR) revised guidelines for the treatment of RA[18] strongly recommend, as first line, the use of weekly methotrexate alone or in combination with other DMARDs like hydroxychloroquine or sulfasalazine in DMARD-naive patients who have moderate to high disease activity. Methotrexate dose should be titrated against clinical response.[18] Corticosteroids are however recommended as bridge therapy and should be tapered and stopped as soon as the targets of remission or low disease are reached. The guidelines also recommend that doctors and their patients through shared decision-making, can consider tapering medications if treatment targets have been maintained for at least six months.[18]Abrupt withdrawal of DMARD therapy is, however, not recommended as this has been associated with high relapse rates and subsequent difficulty in re-establishing remission.[18]

Our patient received methotrexate at a starting dose of 10mg weekly, going up to 15mg within 12 weeks at which remission was achieved. She is also presently taking HCQ, weekly folic acid, low dose prednisolone with gastro-protection, and bone-protection as highlighted earlier.

Methotrexate use is theoretically associated with adverse effects like nausea/vomiting, bone marrow suppression, alopecia, mucositis, hepatotoxicity, and interstitial pneumonitis, especially when treating malignancies like acute leukemias.[19] It works by inhibiting folate synthesis in rapidly dividing cells like cancer or inflammatory cells, but can also deplete normal cells of folate, thereby causing its side effects.[20] The use of low doses of this drug, however, in the treatment of RA has been found to be safe by observational studies and systemic reviews.[21-23] The concomitant administration of folic acid a day after methotrexate has also been shown to reduce the incidence of MTX side effects.[24]

CONCLUSION

Temporomandibular joint involvement is a frequent feature of established rheumatoid arthritis[25], but isolated TMJ arthritis as initial manifestation of RA is rare. A raised acute phase reactant like ESR in any patient presenting with unexplained TMJ pain should heighten the suspicion of an underlying inflammatory cause. Awareness among clinicians that the TMJs can be affected early in RA prior to the involvement of other joints should be emphasized so that early referrals are made for further evaluation and co-management.

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