

Temporomandibular Joint Deformities and Atlantoaxial Impaction in Rheumatoid Arthritis

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ABSTRACT

Rheumatoid arthritis is the most common type of autoimmune arthritis characterized by inflammation of the synovial membranes. Even though any articulation can be involved, temporomandibular joints are considered among the last ones to be affected. Cervical spine involvement is also considered a feature of long-standing disease, atlantoaxial impaction with vertical subluxation of the odontoid process through the foramen magnum being one of the most serious complications. Hereby we report a 44-year old patient with rheumatoid arthritis who presented with increasing headaches for several months. Medical imaging investigation revealed severe deformities of both temporomandibular joints and an upward displacement of the odontoid process above the foramen magnum consistent with atlantoaxial impaction. Relevant findings that can be obtained by different imaging modalities and potential therapeutic strategies are also discussed.

Case Presentation

A 44 year old woman with known history of rheumatoid arthritis presented with increasing headaches for several months. She also complained of pain and tenderness in her temporomandibular joints, particularly on the right side. Her clinical presentation and recent imaging were consistent with advanced rheumatoid arthritis (Figures 1, 2); however, her headaches and temporomandibular pain were relatively new. An MRI scan revealed severe deformities in her temporomandibular joints, more prominent on the right (Figure 3A; arrowheads). The findings were confirmed on a head Computed Tomography (CT) (Figure 3B; arrowheads). An upward displacement of vertebral elements with the tip of the odontoid process projecting above the foramen magnum was also noted on both MRI (Figure 3C) and CT (Figure 3D), consistent with atlantoaxial impaction (curved arrows)..

Temporomandibular joints are usually among the last joints to be involved in patients with rheumatoid arthritis and may present with a variety of symptoms, including with headaches. Similar to the process in other joints, inflammatory cells of the immune system gather in the synovium, forming a fibrous layer of

abnormal tissue (called pannus) with subsequent cartilage destruction and erosions as well as damage of the soft-tissue structures of and around the joint. In the end, the affected joints lose their shape and alignment, resulting in severe deformities. Atlantoaxial impaction, also called basilar invagination or basilar impression, occurs in about 5-10% of patients with cervical rheumatoid arthritis and is commonly attributed to the loss of axial supporting structures in the upper cervical spine, erosive changes and osseous resorption of the lateral masses of the atlas [1]. Symptoms may become apparent during head flexion and present as posterior skull pain. Obstructive hydrocephalus or syringomyelia may also occur because of mechanical blockage of the normal flow of cerebrospinal fluid. Such patients may also be at risk for sudden death, even though this has been described extremely rare.

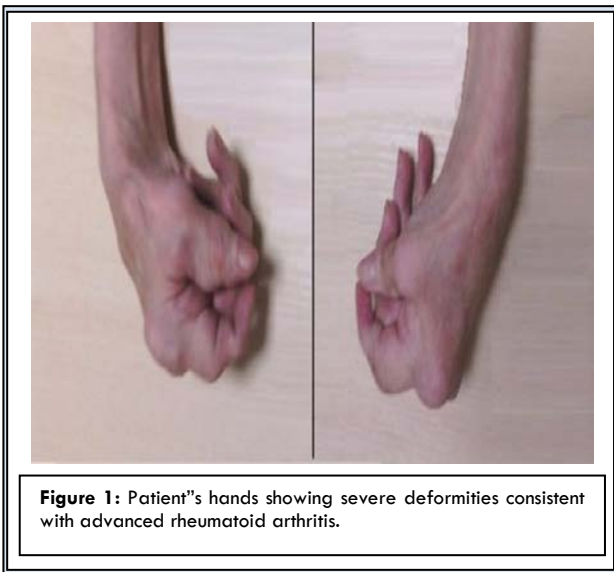


Figure 1: Patient's hands showing severe deformities consistent with advanced rheumatoid arthritis.

Conventional radiography remains the standard imaging technique for joint evaluation. Computed Tomography (CT) can be particularly useful for evaluating abnormalities in complex joints, such as temporomandibular and craniocervical junctions [2]. MRI can be used for assessing the disease activity, the amount of cartilage destruction or associated cervical myelopathy as well as for differentiating synovial fluid and inflammatory pannus [2]. MRI is also indicated when plain radiographs show any degree of atlantoaxial impaction, subaxial stenosis with a canal diameter ≤ 14

mm or atlantoaxial subluxation with a posterior atlantodental interval ≤ 14 mm [3]. MR imaging in the flexed position is occasionally used to evaluate suspected cord compression, the head flexion causing significant narrowing of the subarachnoid space posterior to C2 vertebra [4].

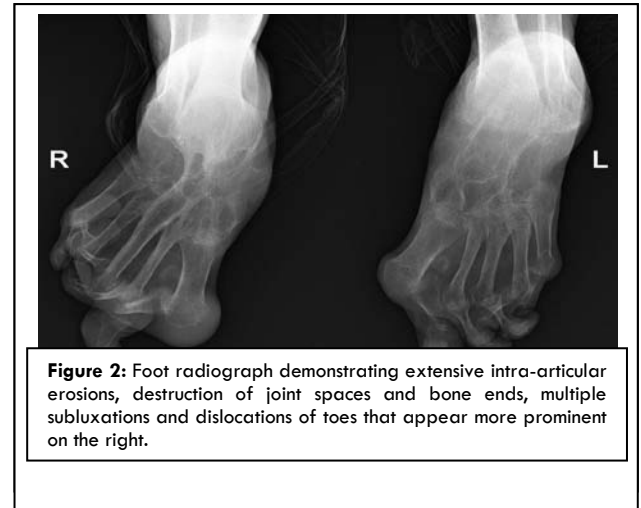


Figure 2: Foot radiograph demonstrating extensive intra-articular erosions, destruction of joint spaces and bone ends, multiple subluxations and dislocations of toes that appear more prominent on the right.

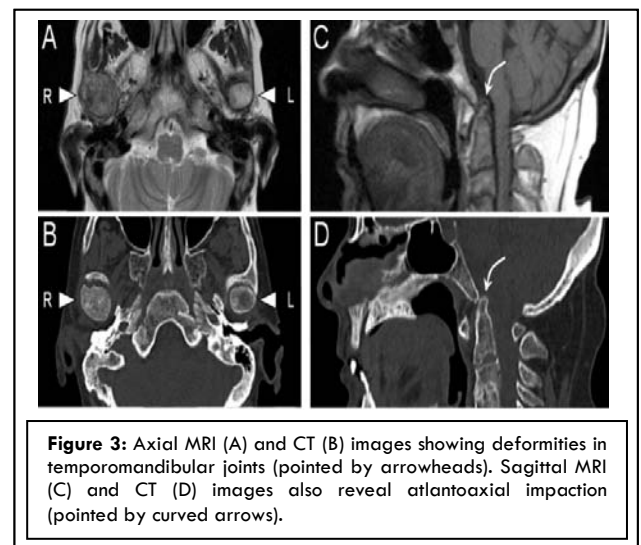


Figure 3: Axial MRI (A) and CT (B) images showing deformities in temporomandibular joints (pointed by arrowheads). Sagittal MRI (C) and CT (D) images also reveal atlantoaxial impaction (pointed by curved arrows).

Treatment strategies may include lifestyle modification, regular radiographic follow-up, neurophysiological investigations, and early surgical interventions such as transoral or endonasal odontoidectomy, when indicated [1,3,5]. Concomitant narrowing of the spinal canal or atlantoaxial instability may require anterior decompression with corpectomy and/or posterior laminectomy with posterior plate fixation [1].

References

1. Grob D. (2004). Surgical aspects of the cervical spine in rheumatoid arthritis. *Orthopade*. 33: 1201-1212.
2. Scutellari PN, Orzincolo C. (1998). Rheumatoid arthritis: sequences. *Eur J Radiol*. 27: S31-38.
3. Kim DH, Hilibrand AS. (2005). Rheumatoid arthritis in the cervical spine. *J Am Acad Orthop Surg*. 13: 463-474.
4. Reijnierse M, Breedveld FC, Kroon HM, Hansen B, Pope TL, et al. (2000). Are magnetic resonance flexion views useful in evaluating the cervical spine of patients with rheumatoid arthritis? *Skeletal Radiol*. 29: 85-89.
5. Iacoangeli M, Gladi M, Alvaro L, Di Rienzo A, Specchia N, et al. (2013). Endoscopic endonasal odontoidectomy with anterior C1 arch preservation in elderly patients affected by rheumatoid arthritis. *Spine J*. 13: 542-548.