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Osteoarthritis in temporomandibular joint

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Abstract
Osteoarthritis (OA) of the Temporomandibular Joint (TMJ) is a progressive degenerative condition characterized by the breakdown of articular cartilage, subchondral bone remodelling, and varying degrees of inflammation. It often presents with joint pain, limited mandibular movement, stiffness, and crepitus, significantly affecting the patient's quality of life. This article discusses a case of osteoarthritis in the Temporomandibular Joint (TMJ), which was unexpectedly found in a 29 years old female patient.

Keywords: Osteoarthritis, Temporomandibular Joint (TMJ), TMJ-OA, Joint Pain, Condylar flattening, MRI, CBCT, NSAIDs, orofacial pain, estrogen receptors

Introduction
Osteoarthritis (OA) is a chronic degenerative joint disorder marked by progressive cartilage degradation, subchondral bone changes, and synovial inflammation. While it commonly affects weight-bearing joints such as the knees and hips, osteoarthritis can also involve the Temporomandibular Joint (TMJ), resulting in a subset known as TMJ osteoarthritis (TMJ-OA) [1].

TMJ-OA is characterized by clinical symptoms such as joint pain, restricted mandibular movement, joint sounds (clicking or crepitus), and functional impairment. The pathogenesis involves mechanical stress, age-related degeneration, hormonal influences, and inflammatory mediators, all of which contribute to joint deterioration [2, 3]. Females, especially in the middle-aged population, appear to be more frequently affected, possibly due to hormonal modulation and differences in joint anatomy [4].

Diagnosis of TMJ osteoarthritis involves a combination of clinical evaluation and imaging techniques.

Radiographic tools such as panoramic radiographs, Cone-Beam Computed Tomography (CBCT), and Magnetic Resonance Imaging (MRI) are crucial in identifying changes like condylar flattening, osteophyte formation, and joint space narrowing [5].

Management is typically conservative in early to moderate cases, involving analgesics, occlusal splints, physiotherapy, and patient education. Advanced or unresponsive cases may require surgical intervention [6].

Case report
A 29-year-old female patient presented to the outpatient department of medicine with complaints of dull, aching pain on the right side of the jaw for the past five months, which had gradually worsened. She also complained of a clicking sound in both temporomandibular joints while opening and closing the mouth and sense of stiffness, especially in the morning. The Clinical Examination shows:

- Deviation of the jaw to the right during mouth opening
- Interincisal mouth opening was limited to 28 mm
- Palpation revealed tenderness over the right TMJ
- Crepitus was noted during joint movement
- No facial asymmetry or lymphadenopathy

Imaging findings

- **Panoramic Radiograph (OPG):** Flattening and sclerosis of the right condylar head
- **MRI:** Decreased joint space and signs of anterior disc displacement without reduction
- **CBCT:** Irregular joint surface with osteophyte formation.

Based on clinical and radiographic findings, diagnosis of osteoarthritis (Degenerative joint disease) was made.

As the patient was young, surgical treatment was not included in her treatment planning. Non- steroidal anti–inflammatory drugs oral and topical ointments were given for pain relief. Hot and cold fermentation was advised for relief from the tenderness of TMJ muscles. Calcium supplements were given for bone remodelling. The patient was kept on follow-up.

Discussion

Osteoarthritis (OA) of the Temporomandibular Joint (TMJ) is traditionally considered a disorder of aging, marked by progressive degeneration of the articular cartilage and remodeling of subchondral bone. However, recent literature highlights an increasing number of younger individuals, especially females presenting with TMJ OA, thereby shifting the conventional age-related perception of this condition.

Parafunctional habits such as, jaw clenching, and excessive gum chewing are common contributors that impose excessive mechanical loading on the joint, leading to microtrauma and degeneration over time [7, 8]. Psychosocial stress, a significant factor among young adults, further exacerbates these habits, contributing to TMJ dysfunction.

Hormonal influences, particularly the role of estrogen, have been studied in the context of TMJ disorders. Estrogen receptors have been identified in TMJ cartilage and disc tissues, suggesting that hormonal fluctuations could affect joint metabolism and inflammatory responses [8].

Imaging is critical for diagnosis. While panoramic radiographs offer initial assessment, Cone Beam Computed Tomography (CBCT) provides detailed visualization of osseous changes such as condylar flattening, erosion, sclerosis, and osteophyte formation [9]. Magnetic Resonance Imaging (MRI) adds value by assessing soft tissue changes and disc position [10]. Surgical options are generally avoided unless there is failure of conservative therapy or advanced joint degeneration.

This case emphasizes the importance of maintaining a high index of suspicion for TMJ osteoarthritis even in young patients, especially females presenting with chronic orofacial pain. Early diagnosis and intervention can prevent irreversible joint damage and improve long-term outcomes.

Conclusion

Temporomandibular joint osteoarthritis, though commonly associated with older age, can also present in young adult females, often with subtle and progressive symptoms. Timely clinical evaluation and advanced imaging play a critical role in early diagnosis. Conservative, non-invasive management focused on pain control, functional restoration, and patient education can lead to favourable outcomes and prevent long-term joint deterioration. Awareness among clinicians regarding atypical presentations of TMJ osteoarthritis is essential to ensure early intervention and improve quality of life in affected individuals.

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