



Case Report

When earache locks the jaw: A hidden culprit of TMJ ankylosis

Jaishri .S. Pagare¹ , Vikrant Kasat¹ , Simran Dilipkumar Satnani^{1*} , Ishwari Manikrao Garad¹¹Dept. of Oral Medicine and Radiology, Government Dental College and Hospital, Chhatrapati Sambhajanagar, Maharashtra, India

Abstract

The temporomandibular joint (TMJ) is a specialized synovial articulation essential for mastication, speech, and facial expression. TMJ ankylosis, the pathological fusion of the mandibular condyle and glenoid fossa, is rare in children but can severely impair mandibular growth, facial symmetry, and oral function. Infection, particularly chronic or recurrent ear disease progressing to mastoiditis, is an uncommon cause of pediatric TMJ ankylosis. We report a 12-year-old male with a long-standing history of recurrent ear infections and chronic mastoiditis who developed progressive restriction of jaw movements, with clinical and radiographic evaluation confirming TMJ ankylosis and associated facial asymmetry. Surgical management using gap arthroplasty with distraction osteogenesis successfully restored mandibular mobility and symmetry, highlighting the importance of early recognition and timely multidisciplinary intervention to prevent long-term functional and psychosocial morbidity.

Keywords: Temporomandibular joint, TMJ ankylosis, Chronic mastoiditis, Pediatric TMJ disorder, Distraction osteogenesis, Functional rehabilitation, Secondary joint involvement.

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1. Introduction

The temporomandibular joint (TMJ) is a specialized synovial articulation that plays a vital role in mastication, speech, and coordinated mandibular movements.¹ Temporomandibular joint ankylosis is characterized by fibrous or bony fusion between the mandibular condyle and the temporal bone, resulting in progressive restriction of mandibular mobility.² The condition may be classified as true (intra-articular) or false (extra-articular) ankylosis and may present as fibrous, bony, or mixed forms.³ Although trauma is the most common etiological factor, infection remains a significant but less frequently reported cause of TMJ ankylosis.² Otolgic infections such as otitis media and mastoiditis may involve the TMJ because of its close anatomical relationship with the middle ear, external auditory canal, and mastoid air-cell system.⁴ Otitis media can rarely extend to involve the temporomandibular joint, leading to suppurative joint infection or abscess formation due to direct spread from adjacent middle ear structures.⁸ Persistent inflammatory insult to the joint may result in synovial involvement, cartilage destruction, and progressive ossification culminating in ankylosis.¹ TMJ ankylosis secondary to ear suppuration is uncommon in contemporary clinical practice but is reported more frequently in children.^{4,6} When ankylosis develops during the active growth period, it can severely impair mandibular growth, resulting in facial asymmetry, retrognathism, malocclusion, and functional disability.⁵ Experimental evidence further supports that ankylosis occurring during growth leads to abnormal

joint ossification and long-term skeletal deformity.⁷ This case report presents a rare instance of TMJ ankylosis in a 12-year-old boy secondary to chronic mastoiditis, underscoring the importance of early recognition of otogenic causes of TMJ pathology.

2. Case Report

A 12-year-old boy reported to the department with the chief complaint of progressive reduction in mouth opening over the past several years, accompanied by difficulty in chewing and deviation of the mandible during opening. The child's father recalled a severe episode of ear infection at approximately 3–4 years of age, which was managed symptomatically but without complete follow-up. No history of trauma, prolonged intubation, or systemic illness was noted. On general examination, the patient appeared well-nourished with no signs of acute infection.

Extraoral inspection revealed facial asymmetry, with flattening of the left side of face and deviation of the mandible toward the right upon opening. Maximum interincisal opening was 10mm. A prominent antegonial notch was evident on the affected side, suggestive of long-standing functional alteration and compromised mandibular growth. (Figure 1) On clinical examination, the temporomandibular joints were not palpable bilaterally, with tenderness elicited over the right TMJ region.

*Corresponding author: Simran Dilipkumar Satnani

Email: simransatnani1234@gmail.com

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Figure 1: Extraoral view showing A. Deviation of jaw towards right side of face and flattening of face over left side. B. Prominent antegonial notch over right side. C. Figure showing maximum interincisal mouth opening measured at 10 mm.

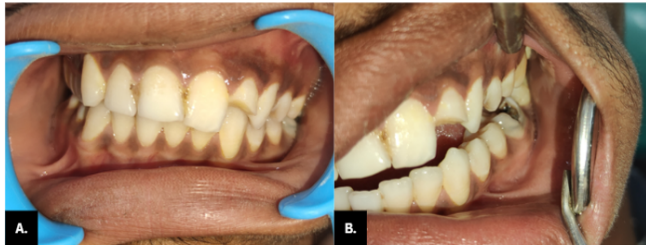


Figure 2: A. Intraoral view showing Ellis class 3 fracture with 22. B. Intraoral view showing RC-6 caries with 36.



Figure 3: A. Orthopantomogram view (OPG) showing reduced ramus height with deformed right condylar region. B. Lateral cephalogram (LC) showing reduced mandibular length and mandibular retrusion.



Figure 4: A. Coronal showing opacification of mastoid air cells on right side. B. Axial view showing opacification of mastoid air cells on right side.

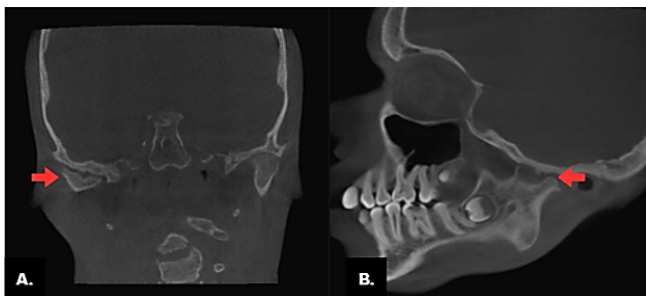


Figure 5: A. Coronal section showing irregular 'jigsaw-like' morphology of the condylar head. B. Sagittal CBCT section

showing decreased vertical height of the mandibular ramus on the right side.

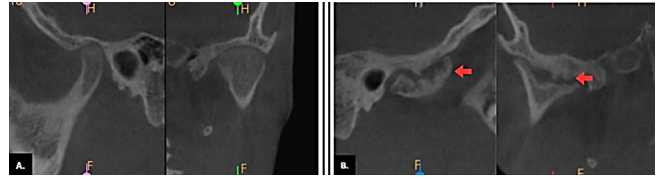


Figure 6: A. Imaging view of the TMJ demonstrating normal anatomical configuration of the left condylar head. B. Imaging view of the TMJ demonstrating altered anatomical configuration of the right condylar head with a characteristic jigsaw pattern.

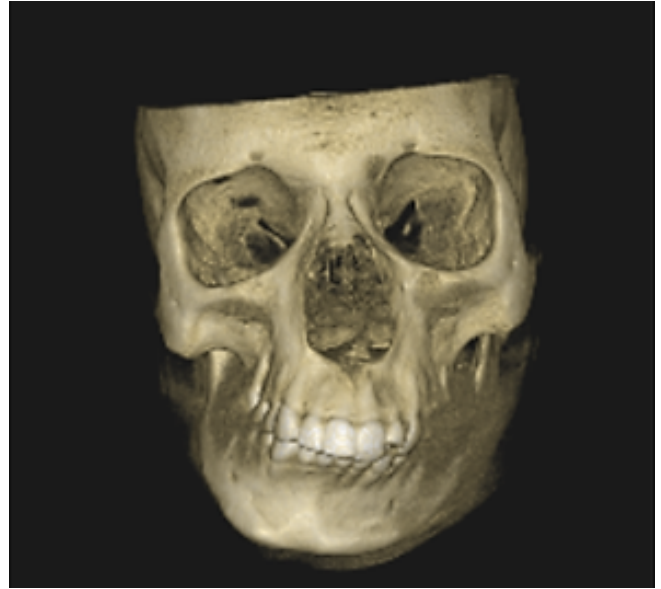


Figure 7: 3D CBCT view showing facial asymmetry over right side of jaw region

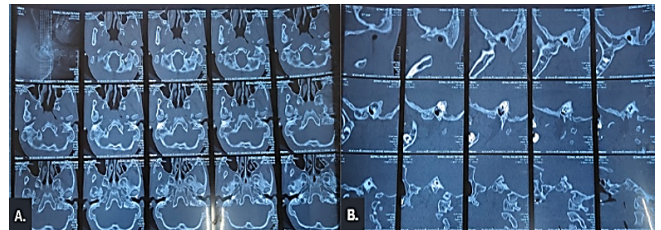


Figure 8: A. Axial view in HRCT temporal bone showing opacification of mastoid air cells. B. Sagittal views of HRCT temporal bone showing altered condylar morphology and mastoid air cells opacification.

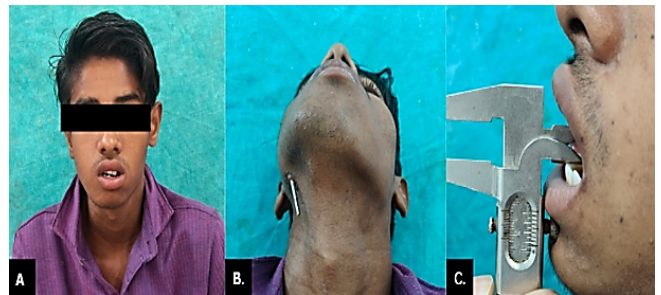


Figure 9: Post-operative follow up photos A: Frontal view showing improved facial profile. B: Submental view demonstrating reduced prominence of the antegonial notch. C: Measurement of mouth opening showing increase from 10 mm to 12 mm.

Intraoral examination revealed caries with 36 and Ellis class 3 fracture with 22. Periodontal examination revealed a fair periodontal status, with satisfactory oral hygiene and no signs of active periodontal pathology. (Figure 2) A noticeable deviation of the mandibular midline toward the right side was observed. Based on the clinical findings, a provisional diagnosis suggestive of right-sided temporomandibular joint ankylosis was made with differential diagnosis of unilateral condylar hyperplasia and post infection degenerative joint disease.

For further evaluation, radiographic investigations including orthopantomogram (OPG) and lateral cephalogram (LC) were performed. The OPG demonstrated an ill-defined, deformed right condylar region with obliteration of the joint space and reduced ramal height. The lateral cephalogram revealed mandibular retrusion, reduced mandibular length, and posterior positioning of the chin, indicating mandibular growth deficiency secondary to long-standing TMJ pathology, consistent with right temporomandibular joint ankylosis. (Figure 3)

For a detailed assessment of the joint and to determine the extent of ankylosis, a full-face cone-beam computed tomography (CBCT) scan was performed. The CBCT revealed irregular erosion and deformity of the right condylar head and glenoid fossa with loss of joint space and an intervening fibrous interface producing a characteristic “jigsaw” appearance, consistent with right TMJ fibrous ankylosis (Sawhney Type III). Associated findings included marked reduction of right ramal height (32.1 mm vs. 50.6 mm on the left), elongation of the right coronoid process, a prominent antegonial notch, and deviation of the chin to the right, indicating long-standing mandibular growth deficiency. Opacification of the right mastoid air cells was also noted, suggesting chronic mastoiditis as a possible etiological factor. (Figure 4, 5, 6, 7)

High-resolution computed tomography of the temporal bones demonstrated sclerosis and soft-tissue opacification of the mastoid air cells with extension into the middle ear cavity via the mastoid auditus and antrum, resulting in opacification of the epitympanum, mesotympanum, and hypotympanum. The ossicular chain and inner ear structures were intact, with no evidence of cholesteatoma, suggestive of chronic mastoiditis. (Figure 8)

Auditory brainstem response testing revealed that right ear peak could not be obtained till 95dBnHL and left ear peak could be obtained till 95dBnHL. Suggesting profound sensorineural hearing loss in the right ear and severe hearing loss in the left ear.

2.1. Final diagnosis

Right temporomandibular joint bony ankylosis secondary to chronic otitis media with mastoiditis

2.2. Treatment and follow-up

A staged surgical approach was planned to release the ankylotic mass, correct mandibular deficiency and facial asymmetry, and prevent re-ankylosis. Under general anesthesia, surgical release of the right TMJ was performed with excision of the ankylotic mass and

placement of interpositional material. This was followed by placement of a mandibular distractor, and distraction osteogenesis was initiated after an appropriate latency period. Gradual distraction was carried out at a controlled rate until satisfactory mandibular lengthening and facial symmetry were achieved, followed by a consolidation phase. Postoperatively, aggressive physiotherapy was instituted to maintain joint mobility. On follow-up, the patient showed significant improvement in mouth opening, mandibular function, and facial symmetry, with stable occlusion, satisfactory bone consolidation, and no evidence of recurrence. (Figure 9)

3. Discussion

Septic arthritis of the temporomandibular joint (TMJ) is an uncommon but potentially serious complication of acute otitis media (AOM) and mastoiditis in children, which can progress to ankylosis if not promptly recognized and treated.⁹ Recent pediatric studies have demonstrated that TMJ septic arthritis may arise from acute mastoiditis, with imaging frequently revealing joint effusion or adjacent abscesses, and some affected children developing ankylosis within months to years after the initial infection.^{10,12}

Early clinical diagnosis can be challenging, as signs such as preauricular swelling, pain, or trismus may be subtle or absent initially, necessitating high clinical suspicion and targeted imaging.¹⁰ Case reports emphasize that children with otogenic TMJ involvement often require a combination of antibiotic therapy and, in select cases, surgical drainage to control infection and prevent further joint damage.^{11,13}

Anatomical factors in children, such as incompletely ossified glenoid fossa and thin temporal bone partitions, may facilitate contiguous spread of infection from the mastoid to the TMJ, making the pediatric population particularly vulnerable.¹⁰ Previous studies on TMJ ankylosis secondary to ear suppuration have reported that persistent post-infectious inflammation may lead to progressive fibrous adhesion and eventual bony fusion of the temporomandibular joint.⁴ Published literature further demonstrates that TMJ infection-related pathology may present with considerable clinical variability, ranging from acute septic arthritis to delayed manifestations such as progressive limitation of mandibular movement without overt signs of active infection.^{15,17} Imaging findings reported in cases of otogenic TMJ involvement include joint effusion, early condylar surface irregularities, and inflammatory changes within the joint space, supporting the concept that structural damage may precede clinically evident ankylosis.^{16,18} Systematic reviews have highlighted the importance of early recognition of limited mouth opening, mandibular tenderness, and imaging findings to initiate timely multidisciplinary management and reduce the risk of permanent joint sequelae.^{13,14}

Given these considerations, clinicians managing pediatric mastoiditis should maintain a high index of suspicion for TMJ involvement, perform appropriate imaging studies, and coordinate care among otolaryngologists, oral and maxillofacial surgeons, dentists, and physiotherapists to prevent long-term functional impairment and growth

disturbances.^{10,12}

4. Conclusion

TMJ ankylosis is an unusual and rare complication of otitis media and mastoiditis that occurs predominantly in young children due to immature or dehiscent anatomical barriers facilitating the spread of infection. Early infection in infancy or childhood can adversely affect mandibular growth and joint function, potentially leading to significant functional and psychological disabilities if not promptly recognized and managed. Chronic otologic infections, including acute otitis media and mastoiditis, may produce secondary effects on the TMJ, with imaging sometimes revealing joint effusion or preauricular collections before ankylosis develops. Delayed recognition of otogenic TMJ involvement is a critical factor that can lead to progressive dysfunction and long-term morbidity. This case highlights the importance of interdisciplinary vigilance; persistent or recurrent ear disease should prompt clinicians to consider adjacent maxillofacial complications to ensure timely and effective management. The clinical presentation is often subtle and can be easily overlooked, emphasizing the need for comprehensive history-taking, careful clinical examination, and targeted imaging to prevent permanent joint sequelae.

5. Source of Funding

None.

6. Conflict of Interest

None.

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