

Temporomandibular joint ankylosis caused by mastoiditis: Presentation of a rare case and literature review

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الانصاق هي كلمة يونانية تعني مفصل متصلب ، التصاق المفصل الفكي الصدغي هو تحديد جزئي أو كامل لحركة المفصل الفكي الصدغي بواسطة النسيج العظمي أو الليفي . هناك العديد من المسببات والتي تساهم في التصاق المفصل . منها: عمر المريض ، رض الفك السفلي ، تلف لقرص المفصل ، ودوام عدم تثبيت الفك السفلي بعد الكسر . قرص المفصل يمكن أن يتلف نتيجة للعرض ، للالتهاب ، أو بسبب نمو ورم خبيث . أسباب وعلاج التصاق المفصل الفكي الصدغي شرحت بشسكل مفصل في العديد من المؤلفات ، والتي تشير إلى أسباب الرئيسية للانصاق هي الرض والالتهاب . ستعرض هنا حالة نادرة لانصاق المفصل الفكي الصدغي لدى طفلة كان سببه الالتهاب المتكرر للأذن الوسطى والحشاء .

والعلاج تألف من استئصال المفصل المتصلق نثائي الجانب واستعاضة اللقمتين المستأصلتين بتطعيم لقمي والتداخل على العضة الصدغية بالتطعيم . نتائج العلاج كانت مقبولة وناجحة وإمكانية فتح الفم بمقدار ٣-٢ سم بعد سنتين من المداخلة الجراحية .

Ankylosis is a Greek word meaning a stiff joint. Temporomandibular joint ankylosis is the development of complete or incomplete limitation of movement of the temporomandibular joint by bone or fibrous tissue. There are many predisposing factors that contribute to ankylosis, including age of the patient, trauma to the mandible, damage to the articular disc and duration of immobilization following fracture of the mandible. The articular disc can be damaged by trauma, infection or neoplasm. The etiology and treatment of temporomandibular joint ankylosis have been well documented in the literature, with trauma and infection being the leading causes. A rare case of temporomandibular joint ankylosis in a young girl is presented. It was an infection sequela following otitis media and mastoiditis.

Treatment consisted of resecting the ankylosed joint, bilateral coronoidectomy and replacement of the resected condyle with a costochondral graft and an interpositional temporalis muscle graft.

Treatment outcome was satisfactorily successful with a mouth opening of 3.2 cm two years following the surgery.

Case Report

A seven-year old Saudi girl was admitted to the Riyadh Dental Center because of limitation of mouth opening which started when she was two years old. Her father said that she had an abrupt onset of fever at the age of 18 months and a concomitant swelling of the left post-auricular region after contracting measles. She then developed progressive restriction of mouth opening. At first presentation, the maximum inter-incisal distance was 10 mm with deviation of the mandible to the left side with opening of about 3-4 mm (Fig. 1). There was no history of trauma and no scar was visible in the mental or submental region. A post-auricular scar indicated that she was treated for acute mastoiditis (Fig. 2). Radiographic examination (ortho-pantomograph, CT scan-axial and coronal) showed a deformed, mushroomed left condyle with both coronoid processes elongated (Fig. 3).

The patient was taken to the operating room

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Fig. 1. At initial presentation, the maximum inter incisal distance was 10 mm with a significant deviation of the mandible to the left side on opening.

where a left condylectomy and coronoidectomy were performed through an Alkayat & Bramly approach including stripping of the muscles attached to the left ramus and angle of the mandible. The contralateral coronoid process was

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Fig. 2. Post auricular scar indicating previous treatment for acute mastoiditis.

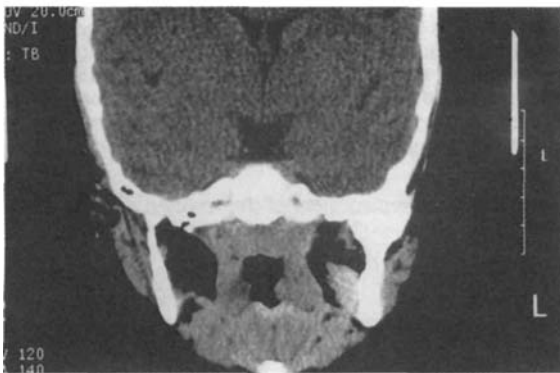


Fig. 3. Coronal cut of CT scan showing a deformed, mushroom shaped left condyle.



Fig. 4. Intra-operative view showing maximum inter incisal opening (46 mm) after resection of the left condyle and both coronoid processes.

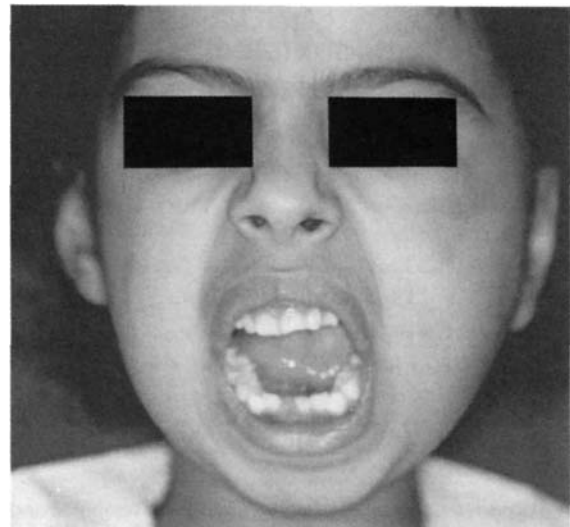


Fig. 5. Passive mouth opening of 32 mm eighteen months post surgery.

resected through an intraoral approach. An intraoperative interincisal distance of 46 mm was achieved (Fig. 4). A costo-chondral rib graft was fixed with wires to replace the resected left condyle. An interpositional temporalis muscle graft was used to aid in preventing re-ankylosis. The post-operative period was uneventful and the patient was discharged from the hospital on the sixth post-operative day with a passive mouth interincisal opening of 35 mm. Eighteen months later, her mouth opening was 32 mm with slight deviation (less than 2 mm) of the mandible to the left side while opening (Fig. 5).

Discussion

Temporomandibular joint ankylosis is a relatively rare condition in the Western world, however higher incidences have been reported in developing countries. It is a serious condition that affects speech, dental health, masticatory function and can cause significant secondary growth deformities if untreated.¹³

A classification of ankylosis was proposed by Kazanjian⁴ in 1938 that divided the disorder into true and false ankylosis. True ankylosis can be caused by a variety of conditions, with trauma and infection being the most common. Infections which may lead to temporomandibular joint ankylosis include osteomyelitis, actinomycosis, rheumatoid arthritis, diphtheria, typhoid, tonsillitis, mastoiditis, suppurative arthritis, measles, scarlet fever and otitis media.⁵

Straith⁶ has classified joint inflammation into

those secondary to blood stream infection, those secondary to local inflammatory processes and to primary inflammation of the joint. Otitis media is a common complication of measles in children and it is a secondary infection by hemolytic streptococci. It is reportedly more likely to affect the temporomandibular joint if there is an obstruction to the exit of pus, such as aural polyps, cholesteatoma, or impacted cerumen of keratosis obturans. Bellinger⁸ has pointed out that suppurative arthritis arising in the joint, frequently creates an exit into the external auditory meatus where it may be misdiagnosed as otitis media. Since only a thin plate of bone separates the middle ear from the glenoid fossa, it seems reasonable that otitis media can involve the joint if there is a barrier to the pus exiting the middle ear.

Mastoiditis and osteomyelitis of the temporal bone or mandible also are contributing factors to the development of temporomandibular joint ankylosis. Infections can spread from mastoiditis in three different ways: direct extension, thrombophlebitis and hematogenous dissemination. The bony walls of the pneumatized space of the mastoid are important barriers to the spread of infection. In the child, dense barriers of bone may not be developed enough to prevent the spread of infection.⁷ However, these infections are in a state of decline as a result of the development of more effective antibiotics. Kieth⁹ and Wright and Moffet¹⁰ have emphasized that growth and maturation changes are not completed in the temporomandibular joint until the second decade of life. Between six months and two and one half years, the articular tubercle and glenoid fossa take on a mature appearance but the articular eminence does not complete its mature S-shape morphology until six to seven years of age.⁹ They also found that the tympanosquamosal fissure remains open medially and is divided into petrosquamosal and petrotympanic fissures by the presence of the tegmen tympani. This could explain how the spread of infection from the middle ear and mastoid reaches the temporomandibular joint. In addition, Moffet¹¹ stated that the tympanic plate does not complete its ossification until approximately five years of age, thus providing a pathway for the direct extension of infection from the middle ear.

In a series of 44 cases of temporomandibular joint ankylosis, Topazian⁵ reported that 19 cases were associated with inflammation and four of

them with otitis media. He pointed out that the incidence of trauma as an etiologic factor ranged from 26% to 75%, whereas the incidence of infection ranged from 44% to 68%. Straith⁶ in 1948 reported 16 cases of ankylosis in which six cases were associated with otitis media and mastoiditis. Heggie³ in a review of 24 cases of ankylosis stated that seven cases were caused by infection. Sleewaegen¹² reported that two of his five cases were caused by inflammation, one of them being osteomyelitis and the other otitis media. One case of neonatal septicemia causing ankylosis has been reported by Kennet.¹³ Finally, Haidar¹⁴ reported eight cases of ankylosis, all of which were caused by trauma to the temporomandibular joint.

References

1. Miller GA, Page HI and Griffith CR. Temporomandibular joint ankylosis: Review of the literature and report of two cases of bilateral involvement. *J Oral Surg* 1975; 33:792.
2. Williams JL, Rowe and Williams. *Maxillofacial Injuries* (2nd ed.). Churchill Livingstone Vol. 1, 1994, 440.
3. Heggie AA. Concepts in the management of temporomandibular ankylosis. *Ann R Australas Coll Dent Surg* 1996; 13:132-5.
4. Kazanjian VH. Ankylosis of the temporomandibular joint. *Am J Orthod* 1938; 24:1181.
5. Topazian RG. Etiology of ankylosis of the temporomandibular joint: Analysis of 44 cases. *J Oral Surg* 1964; 22:227.
6. Straith CL and Lewis JR. Ankylosis of the temporomandibular joint. *Plast Reconstr Surg* 1948; 3:464.
7. Faerber TH, Ennis RL and Allen GA. Temporomandibular joint ankylosis following mastoiditis: Report of a case. *J Oral Maxillofac Surg* 1990; 48(8):866-70.
8. Bellinger DH. Temporomandibular ankylosis and its surgical corrections. *J Am Dent Assoc* 1940; 27: 1563.
9. Kieth DA. Development of the temporomandibular joint. *Br J Oral Surg* 1982; 20:217.
10. Wright DM and Moffet BC. The post-natal growth of the human temporomandibular joint. *Am J Anat* 1974; 141:235.
11. Moffet B. The morphogenesis of the temporomandibular joint. *Am J Orthod* 1986; 52:401.
12. Sleewaegen N et al. Five cases of temporomandibular joint ankylosis in children. *Acta Stomatol Belg* 1971; 68:95.
13. Kennet S. Temporomandibular joint ankylosis: The rationale for grafting in the young patient. *J Oral Surg* 1973; 31: 744.
14. Haidar Z. Ankylosis of the temporomandibular joint: Causes and management. *J Oral Med* 1986; 41:246.