

# Temporomandibular Joint Ankylosis – A Sequelae To Neonatal Septic Arthritis

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**Abstract:** Temporomandibular Joint (TMJ) ankylosis is the pathological osseous or fibrous fusion of the condyle of the mandible with the mandibular fossa of temporal bone. The etiology of TMJ ankylosis includes previous trauma, infection, arthritis and previous TMJ surgery. The Temporomandibular Joint (TMJ) ankylosis in children is rare and the exact causes remain unclear. Trauma is well known as the most common factor in TMJ ankylosis particularly in childhood followed by infection. Septic arthritis of the TMJ is extremely rare in young infants. TMJ ankylosis as a complication of infection is a known but extremely rare condition, with only a few cases reported to date. Here we present a rare case of TMJ ankylosis in a 6 year old male child which was believed to be a consequence of undiagnosed septic arthritis of TMJ in the neonatal period.

**Keywords:** TMJ ankylosis, septic arthritis

## 1. Introduction

The word Ankylosis has a greek origin meaning crooked or bend referring to stiff joints. Temporomandibular joint (TMJ) ankylosis is the pathological osseous or fibrous fusion of the condyle of the mandible with the mandibular fossa of temporal bone.<sup>1</sup>The etiology of TMJ ankylosis include previous trauma, infection, arthritis and previous TMJ surgery. Of these, the most common cause is previous trauma, followed by infection.<sup>2-5</sup>

The Temporomandibular Joint (TMJ) ankylosis in children is rare and the exact causes remain unclear. Trauma is well known as the most common factor in TMJ ankylosis particularly in childhood.<sup>6-10</sup>Hypomobility resulting from ankylosis is an extremely disabling affliction which causes difficulty in mastication, digestion, speech, and oral hygiene. Ankylosis occurring in a child can also cause severe facial disfigurement with long term psychological implications decreasing the quality of life.<sup>11</sup>Here we present are case of TMJ ankylosis in a 6 year old male child possibly secondary to neonatal septic arthritis.

## 2. Case Report

A 6- year- old male child was brought to the department of Oral Medicine and Radiology by his parents with chief complaint of difficulty in mouth opening noticed since the age of one year. Parents also reported difficulty in speech, mastication and oral hygiene practices.

Relevant past medical history revealed that the child was born out of an uncomplicated pregnancy via caesarean section. He was a full term child who weighed 2.6kg with no syndromic associations. However, during the neonatal period, by about 12 days, the child was diagnosed to have septic arthritis of right knee joint. Medical reports were suggestive of heavy growth of pseudomonas and scanty presence of Staphylococcus aureus in pus culture and sensitivity tests. Following, the child was treated with arthrotomy, antibiotics, intravenous immunoglobulin and

exchange transfusion for thrombocytopenia. An external fixator was placed spanning the right knee joint. He was hospitalized for 4 months and recovered well. Difficulty in mouth opening was noticed by parents around the age of 1 year. But they hadn't made any consultations and there was no reported history of facial trauma or fall.

General examination showed evidence of a normal growth pattern, with average height and weight of 115cm and 20kg respectively. He had an unassisted equinus gait with apparent shortening of right lower limb with flexion deformity of knee and equinus at ankle. Wasting of thigh muscles with puckering of the skin over lateral aspect of right knee was observed.

Extra-oral examination revealed facial asymmetry, with roundness and fullness of right side of the face and flattening and elongation of left side, with deviation of the mandible towards the right side on mouth opening. He also possessed a receded chin with a convex side profile. Movement of the right temporomandibular joint (TMJ) not palpable via the external auditory canal. Intraoral examination revealed restricted mouth opening of approximately 5 mm and grossly decayed teeth 74 and 84. Based on clinical examination child was subjected to radiographic evaluation. Panoramic radiograph was of poor diagnostic quality due to the movement of child during exposure. Further imaging with CBCT scan showed obliteration of right TMJ space with bony deposition. The normal relationship of condylar head to glenoid fossa was found in left TMJ, with abnormal condylar head morphology. Thus based on clinical and radiographic findings final diagnosis of right sided true ankylosis possibly secondary to neonatal septic arthritis was considered. Then the patient was referred to department of Pedodontics and oral and maxillofacial surgery for further management.

## 3. Discussion

Temporomandibular joint ankylosis may be partial or complete, bony or fibrous fusion of condylar head to base

of skull.<sup>12</sup> It is a disabling condition which causes impairment of speech, difficulty in mastication, poor oral hygiene, facial disfigurement with a severe psychological burden. Trauma {13-100%} is the most common etiological factor for TMJ ankylosis.<sup>13</sup> It is also associated with local or systemic infection {10 -49%} or systemic disease {10%}, such as ankylosing spondylitis, rheumatoid arthritis, and psoriasis.<sup>13</sup> It can also occur as a result of TMJ surgery.<sup>13</sup> Here we had reported a case of 6 year old child with TMJ ankylosis that was believed to have been a consequence of an undiagnosed septic arthritis of the TMJ in the neonatal period.

Septic arthritis of the TMJ is extremely rare in young infants.<sup>14-18</sup> TMJ ankylosis as a complication of infection is a known but extremely rare condition, with only a few cases reported to date. This could be because of the fact that TMJ ankylosis associated with undiagnosed septic arthritis may remain so and get categorised as idiopathic.

Septic arthritis is a purulent joint infection caused by invasion of microorganisms into the joint space either through the haematological spread from a distant infective foci or post iatrogenic joint inoculation.<sup>19, 20</sup> The latter can occur either due to traumatic joint exposure to a microorganism or contiguous odontogenic, ear or skin infections.<sup>19, 21</sup> Since the joint synovium is highly vascular and has no limiting basement membrane, it is more vulnerable to infection through haematological spread.<sup>21</sup> Septic arthritis usually affects the knee and the hip; while smaller joints like TMJ are affected much less frequently.<sup>22</sup> Septic arthritis of the TM joint most often occurs in adult males, with an average age of 36 years, but it has also been reported in infants and children.<sup>14, 17, 21</sup> The most common presenting clinical features include trismus, pain, swelling and erythema. In neonates and young infants, presenting features are non-specific requiring a high degree of clinician suspicion to elucidate the diagnosis.

Delayed management of TMJ septic arthritis can lead to irreversible damage of the joint structure with subsequent long-term complications like ankylosis. Joint infections initiate an inflammatory response in the host which leads to synovial hyperplasia and subsequent intra-articular abscess formation.<sup>20</sup> This results in increased intraarticular pressure with subsequent diminished joint blood flow, ischaemia and necrosis of the cartilage.<sup>20</sup>

Mandibular condylar cartilage act as the center of greatest growth in the craniofacial complex, and is associated with morphogenesis of maxillofacial skeleton and temporomandibular joint function. So, in growing age, pathology of TMJ affects condylar development, jaw function and the total morphology of face. In our case the child presents with significant facial asymmetry and trismus, which are the typical features of unilateral joint ankylosis. He also had a relevant past medical history of septic arthritis of right knee joint which might have been a source of infection for dissemination into right TMJ or dissemination from an unknown primary infective foci which lead to secondary involvement of right knee joint and right TMJ.

The most common isolated organisms from infected TMJ joint are Gram-positive *Staphylococcus aureus* and *Staphylococcus saprophyticus*. Other causative organisms are *Streptococcus* species, *Neisseria* and *Haemophilus influenza*. Gram-negative bacilli are found in 20–50% of neonates, intravenous drug users and the immunocompromised. In some cases, less common microorganisms such as *pseudomonas aeruginosa* have also been isolated. The causative organism may infect the joint by haematogenous spread from a contiguous infection, by penetration injury of the joint space or following a blunt trauma of the joint. In this case, the exact pathogen responsible for TMJ septic arthritis could not be identified since infection went undiagnosed. However, the pus culture from right knee joint suggested the presence of *pseudomonas* and *staphylococcus aureus*.

Surgical management of TMJ ankylosis is still a major challenge in children. Different surgical techniques have been employed such as gap or interpositional arthroplasty and wide excision of the ankylotic mass with varying methods of reconstruction. However, no single method has produced uniformly successful results. Based on current literature, the ideal treatment option of costochondral graft reconstruction following interpositional arthroplasty was indicated in children, especially in cases of significant facial deformity.<sup>23</sup> The most common surgical complications are limited mouth opening and reankylosis. Temporary paresis of facial nerve, anterior open bite and Frey's syndrome are also have been reported.<sup>24</sup>



**Figure 1:** Facial asymmetry with roundness and fullness of right side of the face and flattening and elongation of left side.



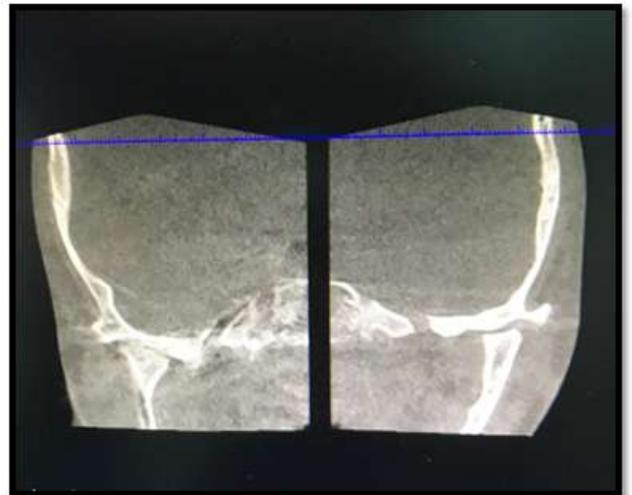
**Figure 2:** Wasting of thigh muscles with puckering of the skin over lateral aspect of right knee.



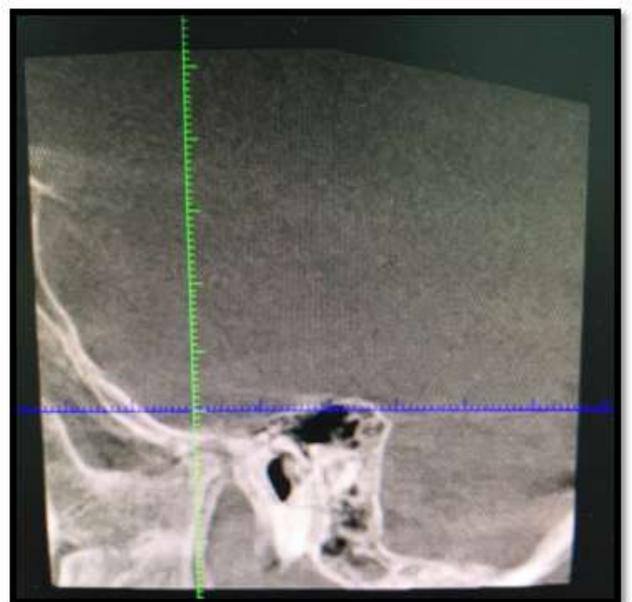
**Figure 3:** Apparent shortening of right lower limb with flexion deformity of knee and equinus at ankle.



**Figure 4:** Deviation of the mandible towards the right side on mouth opening.



**Figure 5:** Coronal section shows obliteration of right TMJ space with bony deposition



**Figure 6:** Sagittal section shows continuity of right condylar head with mandibular fossa.

#### 4. Conclusion

TMJ ankylosis can present as a consequence of undiagnosed septic arthritis of the TMJ in neonatal period. Septic arthritis of the TM joint can be caused by haematogenous spread of distant joint infection or from an unknown infective foci. It is an uncommon condition but early recognition is crucial. Delayed diagnosis and improper management can lead to devastating functional and aesthetic complications in children. So it is essential to rule out the possibility of dissemination of infection into TMJ, in cases with septic arthritis of any joint or any distant septic foci. A multidisciplinary team approach consisting of Pediatric surgeon, Pedodontist and Oral and Maxillofacial surgeon should be considered for the management of such cases.

#### References

- [1] Nitzan D.W.; Bar-Ziv B; Shteyer A. Surgical management of temporomandibular joint Ankylosis Type III by relating the displaced condyle and disc J. Oral Maxillofac. Surg. 1998 56: 1133-1138
- [2] Yew et al. BMC Pediatrics (2015) 15:169
- [3] Loveless TP, Bjornland T, Dodson TB, Keith DA. Efficacy of temporomandibular joint ankylosis surgical treatment. J Oral Maxillofac Surg. 2010;68(6):1276–82.
- [4] Zhi K, Ren W, Zhou H, Gao L, Zhao L, Hou C, et al. Management of temporomandibular joint ankylosis: 11 years' clinical experience. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2009;108(5):687–92.
- [5] Elgazzar RF, Abdelhady AI, Saad KA, Elshaal MA, Hussain MM, Abdelal SE, et al. Treatment modalities of TMJ ankylosis: experience in Delta Nile, Egypt. Int J Oral Maxillofac Surg. 2010;39(4):333–42.
- [6] Guven O. Fractures of maxillofacial region in children. J Craniomaxillofac Surg 1992;20:244-247.
- [7] Ztan HY, Ulusal BG, Aytemiz C. The role of trauma on temporomandibular joint ankylosis and mandibular growth retardation: an experimental study. J Craniofac Surg 2004;15:274-282.
- [8] El-Sheikh MM, Medra AM, Warda MH. Bird face deformity secondary to bilateral temporomandibular joint ankylosis. J Craniomaxillofac Surg 1996;24:96-103.
- [9] BorObakan C. L'utilisation du condyle acrylique dans l'ankylose temporo-maxillaire. Rev Stomatol Chir Maxillofac 1968;69:600-603
- [10] Posnick JC, Goldstein JA. Surgical management of temporomandibular joint ankylosis in the pediatric population. Plast Reconstr Surg 1993;91:791-798
- [11] Hegab A, ElMadawy A, Shawkat WM. Congenital maxillomandibular fusion: a report of three cases. Int J Oral Maxillofac Surg. 2012;41(10):1248–52.
- [12] Kaban LB, Bouchard C, Troulis MJ. A protocol for management of temporomandibular joint ankylosis in children. J Oral Maxillofac Surg 2009; 67:1966-78.
- [13] Vasconcelos BC, Porto GG, Bessa Nogueira RV, Nascimento MM. Surgical treatment of temporomandibular joint ankylosis: follow up of 15 cases and literature review. Med Oral Ptol Oral Cir Bucal. 2009;14:34-8.
- [14] Parmar J. Case Report: septic arthritis of the temporomandibular joint in a neonate. Br J Oral Maxillofac Surg 2008;46:505-6.
- [15] Gayle EA, Young SM, McKenna SJ, et al. Septic arthritis of the temporomandibular joint: case reports and review of the literature. J Emerg Med 2013;45:674-8.
- [16] Leighty SM, Spach DH, Myall RW, et al. Septic arthritis of the temporomandibular joint: review of the literature and report of two cases in children. J Oral Maxillofac Surg 1993; 22:292-7.
- [17] Amos MJ, Patterson AR, Worrall SF. Septic arthritis of the temporomandibular joint in a 6-year-old child. J Oral Maxillofac Surg 2008; 46:242-3.
- [18] Raymond Chuk et al. Septic arthritis of the temporomandibular joint in an infant. Clinics and Practice 2015; 5:736
- [19] Ohl CA, Forster D. Infectious arthritis of native joints. In: Bennett E, Dolin R, Blaser M, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 8th ed. Philadelphia, Pennsylvania, USA: Saunders, 2015. Pp. 1302–17.
- [20] Cai XY, Yang C, Zhang ZY, Qiu WL, Chen MJ, Zhang SY. Septic arthritis of the temporomandibular joint: A retrospective review of 40 cases. J Oral Maxillofac Surg 2010; 68:731–8.
- [21] Lynn MM, Mathews CJ. Advances in the management of bacterial septic arthritis. Int J Clin Rheumatol 2012; 7:335–42.
- [22] Trimble LD, Schoenaers JA, Stoelinga PJ. Acute suppurative arthritis of the temporomandibular joint in a patient with rheumatoid arthritis. J Maxillofac Surg. 1983; 11:92–5.
- [23] Elgazzar RF, Abdelhady AI, Saad KA, Elshaal MA, Hussain MM, Abdelal SE, et al. Treatment modalities of TMJ ankylosis: experience in Delta Nile, Egypt. Int J Oral Maxillofac Surg. 2010;39(4):333–42.
- [24] Erol B, Tanrikulu R, Gorgun B. A clinical study on ankylosis of the temporomandibular joint. J Craniomaxillofac Surg. 2006;34(2):100–6