Temporomandibular Joint Ankylosis in Children

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ABSTRACT

Ankylosis of the temporomandibular joint (TMJ) is a clinical manifestation with multiple etiologies that interferes with the growth of the affected condyle, owing to its fusion with both the glenoid cavity and the skull base with a limitation of mandibular movement, occlusion or forced semi-occlusion, speech and feeding difficulties, and facial asymmetry. Diagnosis and treatment of these oral manifestations are complex, involving several health practitioners such physicians, dental surgeons, physiotherapists, and psychologists. The purpose of this paper is to report a case of a 3-year-old female who presented with limited mouth opening and facial deformity due to birth trauma, which resulted in right TMJ ankylosis and consequently affected the child's growth and 'social' life.

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Ankylosis of the temporomandibular joint (**TMJ**) is a rare condition in which partial or complete immobilization of the mandible[1] occurs because of fusion between the mandibular condyle and skull base.[2,3] It is observed in all age groups.[4] TMJ ankylosis is commonly associated with trauma, infections, and non- or poorly treated condylar fractures.[5-8] Ankylosis is classified as fibrous or osseous. The former involves hinge-like and painless movements, whereas the latter involves immobilization since the condyle is fused to the temporal bone. Unilateral vertical movements of the opposite, nonaffected joint can occur, allowing a reduced mouth opening of that side.[2]

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Trauma resulting from obstetrical forceps,[9] car accidents,[6] and falls[3,6,10] are the major causes of temporomandibular changes in children, consequently affecting their deglutition, mastication, speech, appearance, and oral hygiene.[1] Symptoms generally include a birdlike facial appearance,[3,10] poor mandibular growth,[1,8] facial asymmetry,[1,10] difficulty ingesting solid food,[2] reduced mouth opening, and dental malocclusion.

Diagnosis of TMJ ankylosis can be made through clinical evaluation and computerized tomography (**CT**), magnetic resonance imaging, and panoramic radiography so that condylar deformity, joint space obliteration, and new bone formation can be shown.[1,11] Surgical intervention, the treatment of choice,[7] should be done immediately after diagnosis of ankylosis, followed by postsurgical physiotherapy.[12,13] The goal is to prevent bone neoformation and trismus in the joint region and to restore impaired function, improve aesthetics, and promote psychological well-being.[1,3] The objective of the present study is to describe the oral alterations resulting from TMJ ankylosis in a very young child and the ensuing treatment.

CASE REPORT

A 3-year-old Caucasian girl was brought to the pediatric dentistry clinic of a public faculty in Rio de Janeiro, Brazil, because, according to her mother, the child had a "twisted face." The mother stated that the child had been born weighing 9.92 lb and that the delivery had been complicated and lengthy, causing a fracture of the baby's left clavicle. As a result, the child was hospitalized for 1 week for observation. After hospital discharge, the mother said, the baby cried and often rejected her bottle, thus not feeding properly. For this reason, she returned to the hospital with the baby. Radiographs of the baby's clavicle were taken, but no abnormal finding was observed. Crying during feeding finally stopped when the child was 5 months old.

Figure 1. Asymmetric facial expression of the patient.

Figure 2. Initial mouth opening.

Before her daughter was 1 year old, the mother noticed that the child had difficulty ingesting food because of her reduced mouth opening. This persistent problem required food to be mashed and brought to the child's mouth in small amounts. Regardless of such measures, the mother reported that the child became tired of chewing. The mother supplements the child's diet with a feeding bottle in the morning and evening in addition to providing milk with chocolate powder in the afternoon. The child, however, expressed the desire to "have her teeth treated in order to become more beautiful and to be able to bite a banana."

There was no report of trauma or infection affecting the face following hospital discharge. The child was found to be healthy and within the normal height range (3.084 ft), despite the lower body weight (24.26 lb) for her age. Mandibular retrognathia, double chin, and short neck (Figure 1) were also observed. The mandible was deviated toward the right, with a reduced mouth opening (0.39 in; Figure 2), midline deviation, crossbite on the left side, and marked overjet. The diagnosis of TMJ disorder was confirmed by CT exams (Figure 3), which showed a compact, osseous mass of unilateral ankylosis in the condylar region and glenoid fossa, as well as a prolonged coronoid process. Dental examination revealed carious lesions on the occlusal surfaces of the primary mandibular first molars and maxillary second molars.

The mother was instructed not only about the diet and oral hygiene after meals and at bedtime, but also was given dental floss and a special toothbrush suitable for the child's small mouth opening. The primary teeth were restored by using the atraumatic restorative technique (**ART**).

The child was referred to an oromaxillary surgeon who, after performing a clinical examination and reviewing the radiographs, indicated the need for corrective surgery and ordered preoperative tests (complete blood count, coagulation tests, chest radiograph, and electrocardiogram). The patient was also referred to a pediatrician, who noted from the blood count the presence of anemia and prescribed ferrous sulphate as well as a meal schedule and diet.

Arthroplasty with temporal muscle interposition was the treatment of choice, which was carried out under general anesthesia and nasotracheal intubation. One day after surgery, physiotherapy was initiated with warm and cold compresses, mouth opening, and lateral mandibular movements to overcome TMJ hypomobility and to prevent relapse. The patient was put on a soft diet for the first 4 days, followed by solid foods. Seven months after surgery, the child was found to have a 1.18-in mouth opening (Figure 4). The mother reported that a wide variety of foods, including solids, was being ingested, as the child's weight reached 27.56 lbs.

DISCUSSION

This article reports the case of a 3-year-old girl who presented with reduced mouth opening and facial deformity, suggestive of TMJ ankylosis—a diagnosis later confirmed

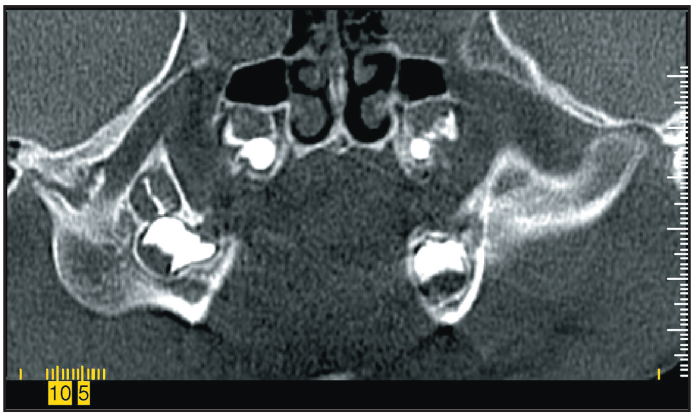

Figure 3. Computerized tomoghaphy showing the right ankylosis.

Figure 4. Clinical aspect 7 months after surgery.

by the medical history, clinical exams, and radiography. Fracture of the baby's left clavicle probably resulted from the fetal anterior shoulder dystocia, an extremely serious, unpredictable, and relatively rare event. During this obstetric emergency, the shoulders are delivered through downward traction, with the fetal head is held with 2 hands to liberate the anterior shoulder.[14]

The left clavicular—as well as the condylar—fracture might have occurred during this maneuver because of the 2-handed grasp. The condylar fracture was not diagnosed; consequently, no treatment was instituted with resultant ankylosis. Because certain pathologies develop slowly and present similar signs, they may be diagnosed erroneously and treated as ankylosis. Among these are Jacob's disease, condylar osteochondroma, chondroblastoma, granulomatous lesions, and condylar lesion,[15] all presenting as a mass in the condylar region and all idiopathic (having no history of trauma, as does TMJ ankylosis).[16-20]

Ankylosis of the temporomandibular joint, if diagnosed during the first months of life, is considered a congenital condition by some authors,[9,21-24] even when caused by trauma during childbirth, as reported in this article. It is not truly congenital.[25] Such a condition is observed prenatally in syngnathia, a rare disorder in which the mandible is fused to the zygomatic complex, thus resulting in TMJ ankylosis.[26] A literature review of true congenital TMJ ankylosis revealed only 8 cases.[13]

Two studies, one about mandibular fracture (N=37)[27] and the other about facial skeleton fracture (N=40),[28] both dealing with children younger than 11 years old, showed TMJ ankylosis in only 1 patient. The second study presented the highest incidence at 10 years of age.[28] The low incidence of TMJ ankylosis in children younger than 5 years, which seems to involve a few cases of osseous fracture, may be due to close parental supervision, limited physical activity, and great osseous resilience compared to older children.[5,6] In the present case, however, trauma occurred during childbirth and resulted in condylar fracture—an event neither diagnosed nor treated, thus causing ankylosis.

As for surgical techniques used in similar cases, include arthroplasty with distraction osteogenesis,[8] arthroplasty with graft, arthroplasty with interposition, and excision and reconstruction of the joint using autogenous and plastic material.[7] In the present case, the technique chosen for treating the fibrous ankylosis was arthroplasty with interposition of a temporal muscle flap between the condyle and glenoid cavity, thus both reducing surgical morbidity and forming a physical barrier to minimize the risk of recurrence.[1,3,7,9,10,13,29]

Newborns gain weight rapidly, doubling during the first 5 months and tripling in the first year of life.[30] Because of the TMJ ankylosis, the patient had difficulty ingesting food, which might have contributed to the below-average weight at age 3 (24.26 lbs), according to percentile levels (10%) established by the National Center for Health Statistics for age and gender. The child's weight increased considerably 7 months after surgery as a result of qualitative and quantitative changes in the diet.

This child having TMJ ankylosis, a reduced mouth opening, and poor oral hygiene resulting in carious lesions, which agrees with the findings of Erol et al.[10] Because conventional methods using high-speed rotation devices were found difficult to perform, it was decided to treat this patient with the ART technique. Aesthetic issues, such as facial asymmetry and insufficient mandibular growth, should be also considered, particularly for those patients younger than 18 years of age with a history of trauma.[10]

These findings corroborate complaints by both child and mother regarding the presence of a "twisted face." The child felt ashamed of her appearance, so her mother, worried about possible harassment by colleagues, decided not to enroll her in school. Clearly, such difficulties can result in serious social damage to the child. In addition to the aesthetic improvement after surgery, her self-esteem

was boosted because of better masticatory function and nutritional status. Quality-of-life studies of individuals with oral disorders such as those reported here reveal the effect they have on the daily life of these children and their families.[31,32,33] If ankylosis had been diagnosed immediately after the trauma been properly treated, the patient would not have suffered the impairments reported herein and her growth and social life would not have been so severely impaired.

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