

Ankylosis Due Sequel of Fracture of the Mandibular Condyle

CASE REPORT

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Abstract

The Ankylosis of the Temporomandibular joint (TMJ) is a disorder of craniofacial complex that results in the merger between the condyle and the mandibular fossa, causing partial or complete immobilization of the mandible. The etiological factors are local and systemic inflammation, infection in the area of TMJ, rheumatic diseases and neoplasms, having the trauma as the main etiologic factor. The traumas are responsible for 31% to 98% of cases of ankylosis. The diagnosis is made from the anamnesis and imaging scans (computed tomography) pointing to the union of joint components. The treatment of ankylosis is a big challenge due the high rate of recurrence that can be affected by factors such as type of ankylosis, surgical technique, age of the patient, post-operative physiotherapy and systematic follow-up of the patient. The various forms of treatment require careful analysis of type of ankylosis if it is intra or extra-articular, unilateral or bilateral and if it is bony or fibrous, There is no consensus in current literature regarding the best treatment. The aim of this work is to present through the report of a clinical case, a surgical treatment of Unilateral Temporomandibular joint Ankylosis, due to sequel of condylar fracture with re-establishment of the stomatognathic functions in postoperative follow-up.

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Keywords

Ankylosis; Temporomandibular Joint; Treatment.

Introduction

The Ankylosis of the Temporomandibular joint (TMJ) is a disorder of craniofacial complex that results in the merger between the condylar and the mandibular fossa, causing partial or complete immobilization of mandible [1].

The ankylosis due to mandibular condyle fractures is a serious pathology, which may result in clinical commitment and affect the masticatory system. The inability of the mandibular movement causes significant functional changes, such as limitation of mouth opening (which could significantly compromise the mandibular growth), facial disfigurement, phonetic difficulties, chewing, swallowing, digestion, airway compromise and hygiene of the oral cavity, as well as emotional, social and psychological disorders. The boundary of the mandibular movement varies from a mild interference to a complete inability of mouth opening [2].

The ankylosis of the TMJ is classified into two types: intra-articular and extra-articular. The intra-articular is the fusion of the condyle, the disc and the complex of the mandibular fossa that occurs within the limits of the joint capsule, the extra-articular affects the coronoid process of mandible and adjacent structures. The classification according to Sawhney (1989), which is type I to IV, through the structure found ankylosed and a type of merged fabric [3]. It can also be classified as the type of material involved (osseous, fibrous or fibro-osseous) and as to the extent of fusion which can be partial or complete [4].

Among the predisposing causes there are local and systemic inflammatory conditions, infection in the region of TMJ, rheumatic diseases and neoplasms, having as the main etiologic factor joint trauma. The ankylosis of TMJ caused by trauma is responsible for 31% to 98% of cases in the population, but 30% result from aseptic trauma [5].

The diagnosis of ankylosis is difficult in the initial period, especially when the bone fusion is not evi-

dent radiographically. To eliminate possible pathologies similar to ankylosis, a careful anamnesis, and a clinical and radiographic examination are of fundamental importance. The differential diagnosis of ankylosis involves the arthrosis, the infectious, inflammatory and metabolic arthritis, benign bone tumors (osteoma, osteochondroma, etc), trauma and neoplasms [6].

A variety of surgical techniques have been proposed to control the ankylosis of TMJ. It have been described in the literature in Arthroplasty "gap", Interposition Arthroplasty, orthognathic surgery, Osteogenic Distraction (DO) and Total joint Reconstruction using alloplastic materials (joint replacement) or autogenic (bone, cartilage and auricular fat). With respect to a standard treatment for ankylosis correction there is no consensus in the literature. Among the majority of cases, these techniques should be used in combination to achieve satisfactory results [7].

The aim of this work is to present through the clinical case report, a surgical treatment of Unilateral Temporomandibular joint Ankylosis, due to sequel of condylar fracture with re-establishment of the stomatognathic functions in postoperative follow-up.

Case Report

Patient A.S. M, 36 years old, male, normosystemic, was referred to the service of oral and maxillofacial surgery and traumatology, reporting reduction of oral opening after facial trauma by motorcycle accident in which he was diagnosed with condylar fracture of the mandible under conservative treatment in the Hospital Regional do Cariri (HRC) in Juazeiro do Norte-CE. It was seen in the initial clinical examination a maximum mouth opening of 5 mm, with prejudice to the intraoral examination (**Figure 1**). The diagnosis was based on clinical assessment complemented with computed tomography (CT) of the TMJ for better detail of the region. The TC

Figure 1: Patient in front view with limitation of mouth opening of 5 mm, during the clinical examination.



Figure 2: Three-dimensional reconstructions of the fusion of TMJ components, with side view left.



changes in the form of the left mandibular condyle with a suggestive image of fibro-osseous adhesion (**Figure 2 to 5**). There was no injury in the right TMJ. Through the clinical and radiographic findings, it was confirmed the diagnosis of ankylosis of left TMJ, type I by Sawhney (1986).

As for the data obtained in the anamnesis, it was highlighted the complaint of pain in the region of the left temporal muscle, limitation of mandibular movements, absence of auditory symptoms and lack of strength to chew. No damages were reported in other joints.

The surgical treatment proposed was the removal of ankylotic mass with the use of Al-Kayat approach associated to surgical techniques as Ipsilateral Coronoidectomy and Arthroplasty of TMJ.

Initially the patient was submitted to general anesthesia with nasotracheal intubation through the use of nasofibroscopy due the impossibility via

Figure 3: A three-dimensional reconstructions of the right TMJ without presence of ankylotic mass.



Figure 4: Axial view of TMJs showing a large bone mass on the left side.



Figure 5: Coronal section of TMJs, with asymmetric display between the TMJs, demonstrating the joint space reduction of left TMJ.

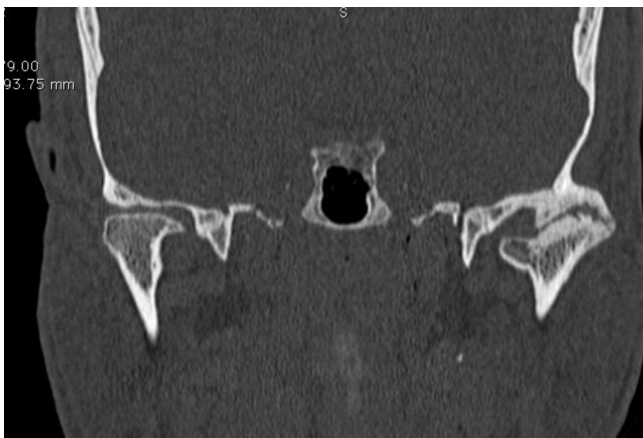


Figure 6: Pre-Auricular incision demarcation, with anterosuperior extension.



Figure 7: Pre-Auricular incision with temporal extension.



laryngoscopy. The location of incision was marked previously extending the temporal region in the area of the scalp until the lower edge of the earlobe with 8 cm of length (**Figure 6**). After marking the incision, it was performed local infiltration in the subcutaneous plane on the incision area of 2% lidocaine and 1:200,000 epinephrine to control hemostasis.

The access to TMJ was performed through pre-auricular incision with left side temporal extension (access Al-Kayat) (**Figure 7**), divulsing the plans,

Figure 8: Transoperative aspect of ankylosis with ankylotic mass exposure.

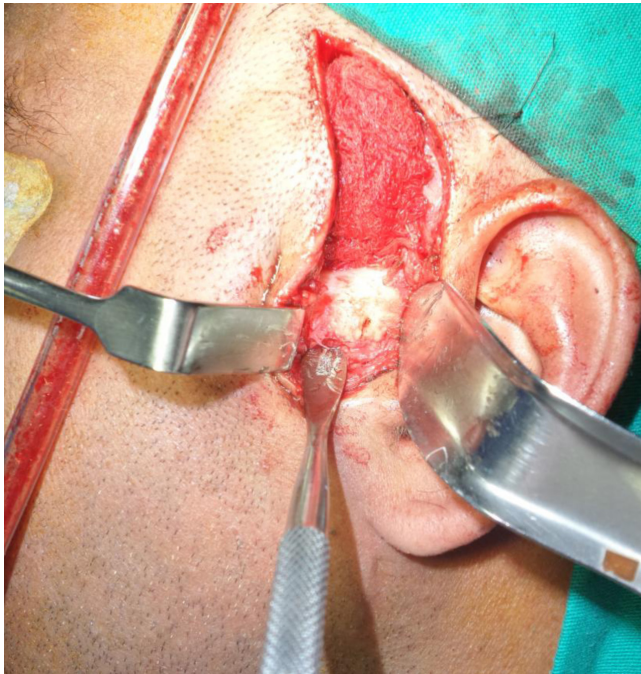


Figure 9: Transoperative aspect after removal of ankylotic mass and irrigation with saline solution 0.9% and cleaning of the operative wound.



where it was obtained the exposure to ankylotic mass (**Figure 8**).

The ankylosed region was exposed and the soft tissues were displaced with the aid of the MOLT-Type Periosteal Elevator. The ankylosed region was prepared for the osteotomy, with the aid of a number 701, 702 drill bit and spherical drill bit for elimination of sharp edges, under high rotation and abundant irrigation with saline, proceeding to Ipsilateral Coronoidectomy (**Figure 9**). It was not installed any interposition or graft material.

After verification of the maximum mouth opening of 50 mm, the subcutaneous tissues were sutured by planes with Vicryl® suture 4-0 in the internal planes and with suture Nylon suture 5.0 in simple stitches on the skin (**Figure 10**). A vacuum drain was installed to prevent infections, bruising and swelling. The patient was kept 48 hours with the mouth opened with the help of a mouth opener. The patient was referred to physiotherapy team, where he started the sessions of motor physiotherapy with wooden sticks to stimulate the mouth opening.

Figure 10: Suture.



Figure 11: Mouth opening of 45 mm after 6 months of postoperative.

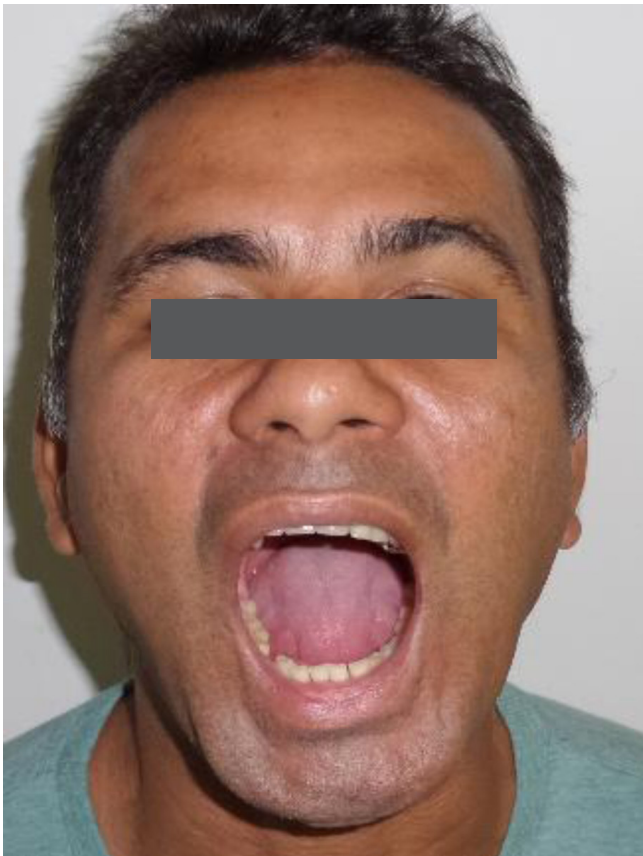


Figure 12: Post-surgical tomography.



After 8 days of surgery, the patient returned to suture removal service and postoperative assessment, where there was an oral opening of 45 mm (**Figure 11**), and there was no impairment of the functions of the facial nerve. Two years after surgery, the patient presented maintained and stable occlusion, without signs of re-ankylosis, proven by postoperative computed tomography (**Figure 12**).

Discussion

Ankylosis of the TMJ is a complication of the cranio-facial complex that involves the intracapsular union of condyle to the temporal joint surface with fusion of bones (osseous ankylosis) or calcification of ligaments (fibrous ankylosis) [8].

It has its main classification according to Sawhney that is named in four types. The type I, the condyle remains and has only fibrous adhesions; the type II, presents an osseous fusion and the condyle is refurbished, however the medial pole keeps intact; type III, it presents itself ankylosed, as the branch of mandible merged with the zygomatic arch, however the medial pole is intact. The type IV, the TMJ presents a total anatomical change due ankylosed structures [9].

The trauma still constitutes the etiological factor predisposing the TMJ ankylosis, however many causes and treatments of this condition have been well documented in the literature [10].

The primary clinical sign of this pathology is the chronic mandibular hypomobility, in view of the asymptomatic character of the disease. The diagnosis is confirmed by Imaging tests, by using TC because of its high resolution image, full view of the region, highlighting differences between tissues of different density, possibility to define the type and extent of the lesion, reveals the anatomical limits preserved or with alterations, having thereby important application in surgical planning [11].

The differential diagnosis of ankylosis is difficult, especially in the initial phase. It involves the arthro-

sis, the inflammatory, infectious and metabolic arthritis, the benign bone tumors, trauma and neoplasms [12].

The surgical approach is a way to treat a patient with TMJ Ankylosis, but there is no consensus in the literature as to the best surgical treatment technique. It has been employed different techniques, including Simple Arthroplasty, Interpositional Arthroplasty, joint reconstruction with acrylic or titanium prostheses and resection of the ankylotic block [13].

The technique used was simple Arthroplasty, which is the oldest surgical technique used in the treatment of TMJ, as well as being more simple and low cost. It has as main advantage the reduction of surgical time and low morbidity, because it does not require donor area. While the disadvantages associated with this technique include failure in removing all ankylotic mass, formation of a pseudoarticulation, with shortening of the mandibular branch and elevation of recurrence rates [14].

However, in this case, the technique used was the simple Arthroplasty in order to reduce the disadvantages of the use of interposition materials, as development of foreign body reaction to non-biocompatible materials, surgical time and greater need for donor area [15].

The interposition material used in Arthroplasty presents advantages as autogenous nature, resilience, adequate blood supply, proximity of the joint, as well as to provide a transfer of vascularized tissue for the joint region and to prevent recurrence. However, there are disadvantages, as the donor area morbidity and unpredictable reabsorption of the autogenous used [16].

Currently the Arthroplasty is not the preferred choice because of recurrence. The common objective of these surgical techniques is fully or partially to remove the ankylotic mass [17].

Ma J (2015) observed the postoperative results of Arthroplasty in *gap* and Interposition Arthroplasty, and showed that 53% of cases of recurrence were treated through Arthroplasty in *gap* [18].

Manganello-Souza and Mariani (2003) reported that 9 patients operated of ankylosis with Arthroplasty technique and the reconstruction of the TMJ with autogenous costochondral grafting showed good results. These authors reported that, over the course of 53 months of postoperative follow-up, they observed only 1 case of recurrence [19].

Another technique widely used is the Coronoidectomy which is effective for the intraoperative and postoperative increase stabilizing the mouth opening. It is recommended under conditions where there are chances of trismus due to temporal muscle spasm [20].

These techniques have as therapeutic objectives to relieve pain, to allow the condylar growth, to improve the oral amplitude, to restore the anatomy, the occlusal function and pathology removal [21].

Success in the operative treatment of ankylosis is independent of the technique used, there is a consensus in the literature that the achievement of physical therapy intensive and constant is critical to successful treatment [22].

The postoperative period includes a long period of Physiotherapeutic Rehabilitation with the aim of preventing bone neoformation in articulation, trismus, atrophies and muscular spasms, normalize the function of opening mouth and chewing of the patient, considering that in these cases the musculature involved presents characteristic atrophic by disuse [23].

During the transoperative, it was obtained a mouth opening of 50 mm, where the Coronoidectomy was held in order to assist in the mandibular release. In the case reported, it was showed an acceptable oral immediate opening of 50 mm and late of 45 mm. The result was satisfactory, with no postoperative complications or recurrence during the period of monitoring [24-30].

Conclusion

It can be concluded from this study that, the etiology of TMJ ankylosis is quite diverse, requiring a detailed clinical examination to investigate its origin, being the most commonly reported trauma factor. Among the tests for image, the computed tomography is essential for the diagnosis. The treatment is surgical, being the Arthroplasty without interposition the least invasive technique and requires less surgical time. The postoperative period is more comfortable to the patient because there is no need of grafting, reducing the risk of injury in noble structures. The technique presents some disadvantages such as the risk of posterior and anterior open bite in cases of unilateral and bilateral ankylosis, respectively, in addition to the risk of long-term reankylosis. It is essential to the early and intense physiotherapy to obtain good results. The most frequent complications, after treatment of ankylosis, are limited mouth opening and reankylosis, and occlusal disorders may also occur.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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