

Surgical Resolution of TMJ Ankylosis and Late Mandibular Pseudoarthrosis after Facial Trauma. A Case Report

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Received: May 26, 2021; Published: July 01, 2021

Abstract

Objectives: The objective of this article was to report a case of a pseudoarthrosis in the mandibular body associated with TMJ ankylosis and to describe the conduct followed in an attempt to jointly resolve existing problems.

Case Report: A 46-year-old male patient was seen at the Oral and Maxillofacial Surgery outpatient clinic of Hospital Municipal São José in the city of Joinville/SC, reporting difficulty opening his mouth. In the interview, he also reported having suffered facial trauma 4 years ago, with a mandibular fracture and installation of a plate and screws in the region. Clinical examination showed a maximum mouth opening of 15 mm. As well as radiographic images, there is an ankylosis in the TMJ on the right side associated with pseudoarthrosis in the ipsilateral mandibular body. A surgical resolution for both problems was proposed concurrently.

Final Considerations: At the end of the surgery, the mandibular movement was returned with a fat tissue interpositional arthroplasty and the pseudoarthrosis was solved with an autogenous bone graft and the use of a 2,4 mm system reconstruction plate. The patient is followed up, without complications.

Keywords: Temporomandibular Joint Disorders; Ankylosis; Arthroplasty; Pseudoarthrosis; Bone Grafting

Abbreviation

TMJ: Temporomandibular Joint

Introduction

Ankylosis of the temporomandibular joint (TMJ) is a condition severely deforming and disabling for the patient. It can be defined as being the fusion of the condyle of the mandible with the articular fossa of the temporal bone. This merger is fibrous at an earlier stage of the disease and may be bony at a later stage disease, in which the anatomical characteristics of the region are lost [1]. This formation can cause loss of function of the mandibular joint, with limited mouth opening, partial or total impairment of masticatory capacity, swallowing, speech and oral hygiene [2]. The main causes of TMJ ankylosis are trauma or fractures condylar with displacement of the articular disc [3], followed by infections in the TMJ region [4]. When TMJ ankylosis occurs before or during the growth

phase, the patient may be affected by micrognathism and narrowing of the airways with consequent respiratory difficulty [2]. Children are at high risk of developing this complication, as they have a high osteogenic potential, especially in intracapsular condylar fractures with hematoma formation [1].

The forms of treatment described in the literature are gap arthroplasty, interpositional arthroplasty and total TMJ reconstruction with alloplastic and autogenous material [5]. Ankylosis recurrence is the most reported problem after the arthroplasty [4]. This is mainly due to the fact that the patient does not follow the postoperative guidelines and does not perform physical therapy correctly [6]. Another factor that can cause a new ankylosis in the same place is the contact between the two bone surfaces after arthroplasty, so it can be prevented by making osteotomy cuts procedures, creating adequate spaces and using materials to fill the gap formed in

arthroplasty [7]. Adipose tissue is one of the materials that can be used for filling gap during arthroplasty. As the abdominal adipose tissue showed a better result in the period of 1 year after the arthroplasty, in relation to the pediculate oral adipose tissue, presenting less retraction of the interposed tissue, detected in magnetic resonance exams [8].

We can classify the ankylosis according to the tissue involved (fibrous; fibro-osseous, bony and cartilaginous), with extension (complete and incomplete), with the structures involved (true, when the condyle fuses with the articular fossa and false when the coronoid process fuses with the temporal bone, maxilla or zygoma, and the relationship with the articular capsule (intra and extra-capsular) [1].

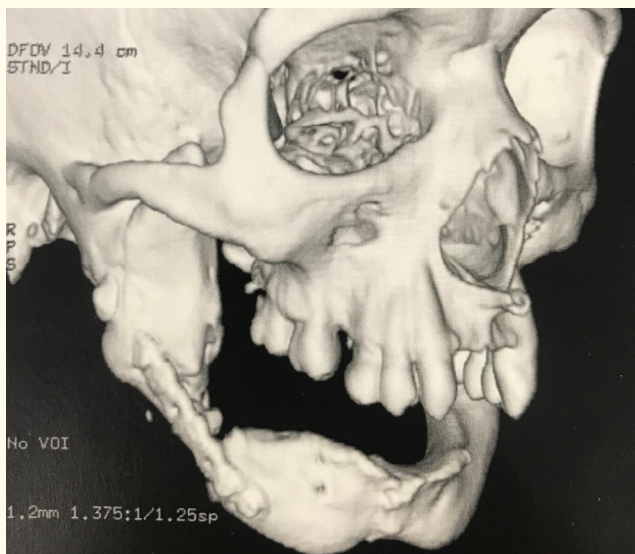


Figure 1: Ankylosis in the right TMJ, reconstruction plate and pseudoarthrosis in the mandibular body.

Another classification is Sawhney's: Type I: the condyle is present and has only fibrous adhesions. Type II: there is bone fusion and the condyle is remodeled, with the medial pole intact. Type III: there is the presence of an ankylotic block (mandibular branch fused to the zygomatic arch), but the medial pole remains intact. Type IV: ankylotic block with alteration of the region's anatomy (fusion of mandibular ramus at the base of the skull) [1]. The ankylosis present in this reported case can be classified as a bone an-



Figure 2: Ankylosis in the right TMJ, reconstruction plate and pseudoarthrosis in the mandibular body.

kylosis, complete, true and extracapsular. It is type IV according to Sawhney's classification [1].

Aim of the Study

The aim of this article was to report a case of a pseudoarthrosis in the mandibular body associated with TMJ ankylosis and to describe the conduct followed in the attempt to jointly solve the existing problems.

Case Report

A 46-year-old male patient, leucoderma, was seen at the outpatient clinic of the São José Municipal Hospital in the city of Joinville/SC by the buccomaxillofacial surgery and traumatology. He reported having suffered facial trauma 4 years ago, with a mandibular fracture and the surgical installation of a plate and screws. During the clinical examination, the patient showed a reduced mouth opening of 15 mm and difficulty in pronouncing the words correctly. It was also evident that the right mandibular branch remained fixed during the mouth opening movement, causing the suspicion of a mandibular body fracture on this same side.

When evaluating the radiographic and tomographic images, the existence of an ankylosis of the TMJ on the right side was found,

which limited or prevented the movement of the mandibular branch (Figure 1 and 2). Another radiographic finding was the lack of bone continuity between the branch and ipsilateral mandibular body and the existence of a reconstruction plate with 5 screws coinciding with the bone defect. Characterizing, in this way, a pseudoarthrosis in the region of the right mandibular body (Figure 1 and 2).

For surgery, nasal intubation with the aid of fibro-laryngoscope video was indicated due to the narrowing of the airways caused by retrognathism. At first, bone tissue was collected in block (cortical and medullary), measuring 4 cm x 2 cm and particulate bone tissue (medullary) from the anterior iliac crest region, to be used in mandibular reconstructions (Figure 3). The bone was found in a saline container until it was used in the reconstruction. In the same incision used to collect bone tissue, abdominal adipose tissue was also obtained. This fat was stabilized in the TMJ region after removal of the ankylotic bone mass (Figure 3).

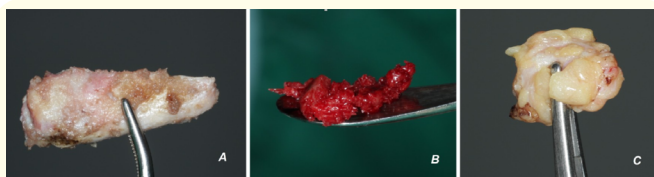


Figure 3A-3C: (A) - block bone graft removed from the iliac crest.
 (B) - particulate bone graft removed from the iliac crest.
 (C) - abdominal adipose tissue.

Subsequently, the region of the right mandibular body was submitted to a submandibular access so that the pseudoarthrosis region could be better visualized. With the divulsion of the soft tissue and fibrous tissue, the reconstruction plate and the screws existing in the region were removed, the bone stumps were reanatomized for the installation of a new reconstruction plate. The medial portion of the branch and distal of the body were then stabilized with plate and screws of the 2.4 mm system (Neoortho). Then, the block bone graft was fixed and stabilized on the same plate with screws from the same system. The particulate bone removed from the iliac crest filled the existing gaps (Figure 4).

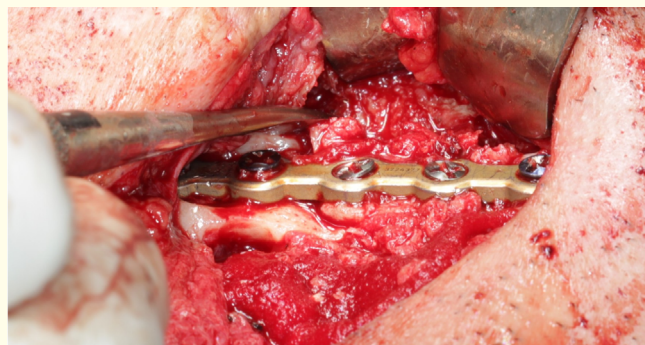


Figure 4: Mandibular reconstruction with 2.4 mm plate and screws in the installation phase and autogenous bone grafts in block and particulate.

A preauricular access [9] was used for the right TMJ (Temporo-mandibular Joint) region. The incision was demarcated with a specific sterile pen along the length of the ear, taking advantage of a natural crease, at the junction of the facial skin with the helix of the ear, up to its top, including an anterior extension, obtaining a hockey stick shape. The skin and subcutaneous connective tissues were incised with n.15 blade up to the superficial layer of the temporal fascia following the reference drawn. The upper region of the incision (above the zygomatic arch) was dissected about 2 cm anterior to the superficial layer of the fascia of the temporal muscle. In this way, the flap could be retracted previously without tension. Divulsion was performed after the incision in an avascular plane, between the external acoustic cartilage and the glenoid lobe of the parotid gland to the same plane as the previous dissection. In continuity, a horizontal incision in the superficial layer of the temporal fascia close to the zygomatic arch, served to access a periosteum detacher, which was used for blunt dissection. The intermediate tissues were incised vertically just in front of the external auditory canal to the depth of the periosteum detacher.

When exposing the ankylated region (Figure 5A), the external auditory canal and the zygomatic arch were used as reference points to direct the osteotomy. This approach was necessary to avoid compromising anatomical structures in the region.

The first bone sections were made with an oscillatory saw. One in the horizontal direction just below the zygomatic arch, measur-

ing 1.5 cm in width and depth and the other joined, with the same measure, declining to the rear by 45 degrees. With the help of a drill no. 703 for straight and chisel pieces, a bone "block" corresponding to the condyle head, with a height of 2 cm, was removed, forming a gap at the TMJ site (Figure 5B). After verifying that the mandible had been completely separated from the base of the skull, the gap formed by the arthroplasty (Figure 5C) was filled with adipose tissue previously removed from the abdominal region (Figure 5D). The adipose tissue was stabilized with a polyglactin 9' 4-0 thread (Vicryl - Ethicon) in the zygomatic arch and the closure of the surgical wound was initiated. The sutures were performed in planes, with the internal tissues coaptated with polyglactin 910 4-0 thread (Vicryl - Ethicon) and the skin with 6-0 nylon thread (Procare).

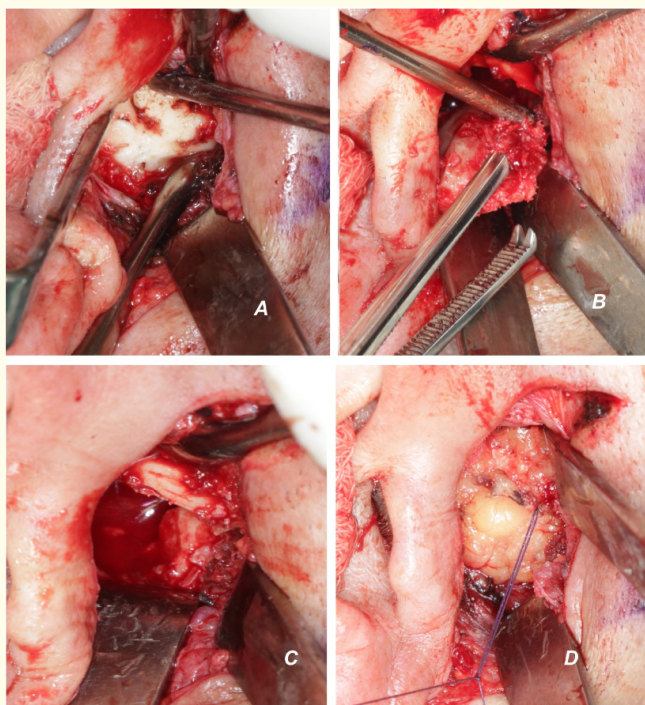


Figure 5: A - Exposure of the ankylated area. B - Removal of the ankylotic bone block. C - GAP. D - Interposition and stabilization of adipose tissue.

The patient remained hospitalized for 24 hours, receiving guidance on postoperative care, physiotherapy and medication. The patient started as physiotherapy while still in the hospital bed, 24 hours after surgery and after hospital discharge he was referred for physical therapy during the first 15 days. After that, he was instructed to do the weekly for the next 6 months.

Postoperative medication was Amoxicillin 500 mg (one capsule every 8 hours for 10 days), Ketoprofen 100 mg (one tablet every 12 hours for 10 days) Dexamethasone 4 mg (one tablet in the morning for 5 days), Paracetamol 500 mg + Phosphate of Codeine 30 mg (one tablet every 6 hours for 10 days).

In this case report, postoperative ultrasonography was not used to assess the adipose tissue grafted in the Temporomandibular Joint.

Results and Discussion

In this case, the integrated work with a multidisciplinary team was important, including Oral and Maxillofacial Surgeons, Orthopedists, Physiotherapists Anesthesiologists and the Nursing Team.

With the surgical resolution of the problems of ankylosis and pseudoarthrosis (Figure 6), the patient gradually resumed the mandibular movements and was instructed to undergo physical therapy as a way to prevent TMJ re-ankylosis. Prosthetic rehabilitation will be planned after bone consolidation of the grafted site.



Figure 6: 60-day postoperative period

The returns for postoperative follow-up occurred in 15, 30, 45 and 60 days with satisfactory evolution, reduction of pain and edema, with no complications. The mouth opening after 60 days was 29 mm.

The patient reported pain in the graft donor site when walking, but it was not something limiting, therefore without the need for any specific treatment.

Conclusion

The correct diagnosis of existing problems, planning based on scientific evidence and the techniques used, were able to restore the function of the masticatory system. In this way, a mandibular movement closer to normality was obtained, with consequent improvement in phonation, breathing and chewing.

Conflict of Interest

The author declares no conflict of interest.

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Volume 4 Issue 7 July 2021

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