

Bilateral fracture of the mandibular condyle: a challenge in surgical management

Fratura bilateral do côndilo mandibular: um desafio no manejo cirúrgico

Fractura bilateral del cóndilo mandibular: un reto en el manejo quirúrgico

ABSTRACT

Fractures of the mandibular condyles are one of the facial traumas that cause the most impact on patients. They represent a therapeutic challenge and require adequate surgical planning because they involve an area rich in noble structures. The treatment aims to restore the patient's occlusion and mandibular movements. **Objective:** The aim of this paper is to describe the surgical management of a complex fracture of the mandible involving the symphysis and condyles bilaterally. **Case Report:** Female patient, a victim of a motorcycle accident, was admitted to the public reference service in CTBMF presenting occlusal dystopia, trismus, and sinking in the pre-auricular region. A facial tomography was requested, which showed a bilateral fracture of the mandibular condyle and symphysis. After stabilization of the general condition, the patient was released for osteosynthesis of the mandibular fractures. The procedure was performed under general anesthesia and nasal intubation. Proceeded with retromandibular accesses for reduction and fixation of the mandibular condyles and intraoral access for osteosynthesis of the fracture of the symphysis. The patient evolved without complications, with a good mouth opening, and without sequelae of the trauma both in the aesthetic and functional scope. Condyle fractures are challenging due to their unique anatomy, presenting several muscular, neurovascular, and cartilaginous structures that result in complex biomechanics. **Conclusion:** Open reduction with stable functional fixation with plates and screws is very well indicated for the treatment of low fractures of the mandibular condyles, being imperative for an adequate anatomical reduction and three-dimensional condylar repositioning. **Keywords:** Trauma; Fractures; Osteosynthesis.

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RESUMO

As fraturas dos côndilos mandibulares constituem um dos traumas de face que mais causam impacto ao paciente. Representam um desafio terapêutico e exigem um adequado planejamento cirúrgico por envolver uma área rica em estruturas nobres. O tratamento visa restaurar a oclusão do paciente e os movimentos mandibulares. **Objetivo:** O objetivo deste trabalho é descrever o manejo cirúrgico de uma fratura complexa de mandíbula envolvendo sínfise e côndilos bilateralmente. **Relato de Caso:** Paciente do gênero feminino, vítima de acidente motociclístico, deu entrada no serviço público de referência em CTBMF apresentando distopia oclusal, trismo e afundamento em região pré auricular. Foi solicitada tomografia de face que evidenciou a fratura bilateral de côndilo mandibular e sínfise. Após estabilização do quadro geral, o paciente foi liberado para osteossíntese das fraturas mandibulares. O procedimento foi realizado sob anestesia geral e intubação nasal. Procedeu-se com acessos retromandibulares para redução e fi-

xação dos côndilos mandibulares e acesso intraoral para osteossíntese da fratura da sínfise. Paciente evoluiu sem complicações, boa abertura bucal, sem sequelas do trauma tanto no âmbito estético quanto funcional. Fraturas de côndilo são desafiadoras devido a sua anatomia ímpar, apresentando diversas estruturas musculares, neurovasculares e cartilaginosas que resultam numa complexa biomecânica. **Conclusão:** A redução aberta com fixação funcional estável com placas e parafusos é muito bem indicada para o tratamento de fraturas baixas de côndilos mandibulares, sendo imperativo uma adequada redução anatômica e reposicionamento tridimensional condilar. **Palavras-chave:** Trauma; Fraturas; Osteossíntese.

RESUMEN

Las fracturas de los cóndilos mandibulares son uno de los traumatismos faciales que más impacto provocan en los pacientes. Representan un reto terapéutico y requieren una adecuada planificación quirúrgica porque involucran una zona rica en estructuras nobles. El tratamiento tiene como objetivo restaurar la oclusión y los movimientos mandibulares del paciente. Objetivo: El objetivo de este artículo es describir el manejo quirúrgico de una fractura mandibular compleja que involucra la sínfisis y los cóndilos bilateralmente. Caso Clínico: Paciente femenina, víctima de accidente de motocicleta, ingresó al servicio de referencia pública en CTBMF presentando distopía oclusal, trismo y hundimiento en región preauricular. Se solicitó una tomografía facial, que mostró fractura bilateral de cóndilo y sínfisis mandibular. Tras la estabilización del estado general, el paciente fue dado de alta para osteosíntesis de las fracturas mandibulares. El procedimiento se realizó bajo anestesia general e intubación nasal. Se procedió con accesos retromandibulares para reducción y fijación de los cóndilos mandibulares y acceso intraoral para osteosíntesis de la fractura de sínfisis. Paciente evolucionó sin complicaciones, buena apertura bucal, sin secuelas del traumatismo tanto en el ámbito estético como funcional. Las fracturas de cóndilo son un desafío debido a su anatomía única, presentando varias estructuras musculares, neurovasculares y cartilaginosas que resultan en una biomecánica compleja. Conclusión: La reducción abierta con fijación funcional estable con placas y tornillos está muy bien indicada para el tratamiento de las fracturas bajas de los cóndilos mandibulares, siendo imprescindible una adecuada reducción anatômica y reposicionamiento tridimensional del cóndilo. **Palabras clave:** Trauma; fracturas; Osteosíntesis.

INTRODUCTION

Maxillofacial trauma has a multifactorial etiology, including traffic accidents, falls, assaults, sports injuries, and firearm injuries. Males continue to be the most prevalent, largely due to their greater tendency to be exposed to risk factors and work activities, with alcohol consumption often associated.¹

The mandible is one of the facial bones with the highest prevalence of fractures. The condylar process is its most fragile area, usually fractured by indirect trauma when the symphysis is reached. This combination of mandibular fractures is considered one of the most common.²

Clinical findings include pain, crepitation, swelling in the TMJ region, hematoma, otorrhagia, depression in the condyle region, anterior open bite, in cases of bilateral condyle fracture, and restriction in mandibular movements. The diagnosis is clinical, complemented by radiographic examinations and computed tomography.³

The therapeutic management of these fractures is a controversial issue and lacks consensus among surgeons, despite its high prevalence. Specifically, the management of bilateral condylar fractures of the mandible is considerably more challenging compared to unilateral fractures. The therapeutic approach choices are usually closed reduction with maxillomandibular locking or open reduction with internal fixation.⁴

Unsatisfactory management of condylar fractures can result in several chronic problems for patients, including malocclusion and deviation of the mandible when opening the mouth, in addition to limitation of mouth opening including the development of ankylosis. In addition, muscle spasms, osteonecrosis, and facial asymmetry have been noted as possible complications.⁵

This work aims to report a case of symphysis fracture associated with a bilateral fracture of the mandibular condyle. The surgery was performed to reduce and fix the bone fragments to reestablish the functions of the patient's stomatognathic system.

CASE REPORT

Female patient, melanodermic, victim of a motorcycle accident, was admitted to the reference public service in oral and maxillofacial surgery in the metropolitan region of the state of Bahia - Brazil.

Upon initial maxillofacial physical examination, a cut-blunt wound was noted on the lower lip, extending to the intra-oral region, occlusal dystopia, trismus, and depression in the pre-auricular region bilaterally.

There was loss of consciousness at the time of the trauma due to the associated TBI. After stabilization of the condition and the first consultation, following the hospitalization, laboratory and imaging tests were performed.

Upon examination of the face tomography, there was a fracture of the mandibular symphysis associated with a bilateral fracture of the condyles

(Figure 1). After evaluation and release from the other specialties, the patient underwent a surgical procedure for the reduction and osteosynthesis of facial fractures after two days of hospitalization. Procedure performed in a surgical center under general anesthesia and nasotracheal intubation. We proceeded with retro-mandibular accesses and intra-oral access to expose the facial fractures (Figura 2).



Figure 1 - 3D Tomography showing mandibular fractures

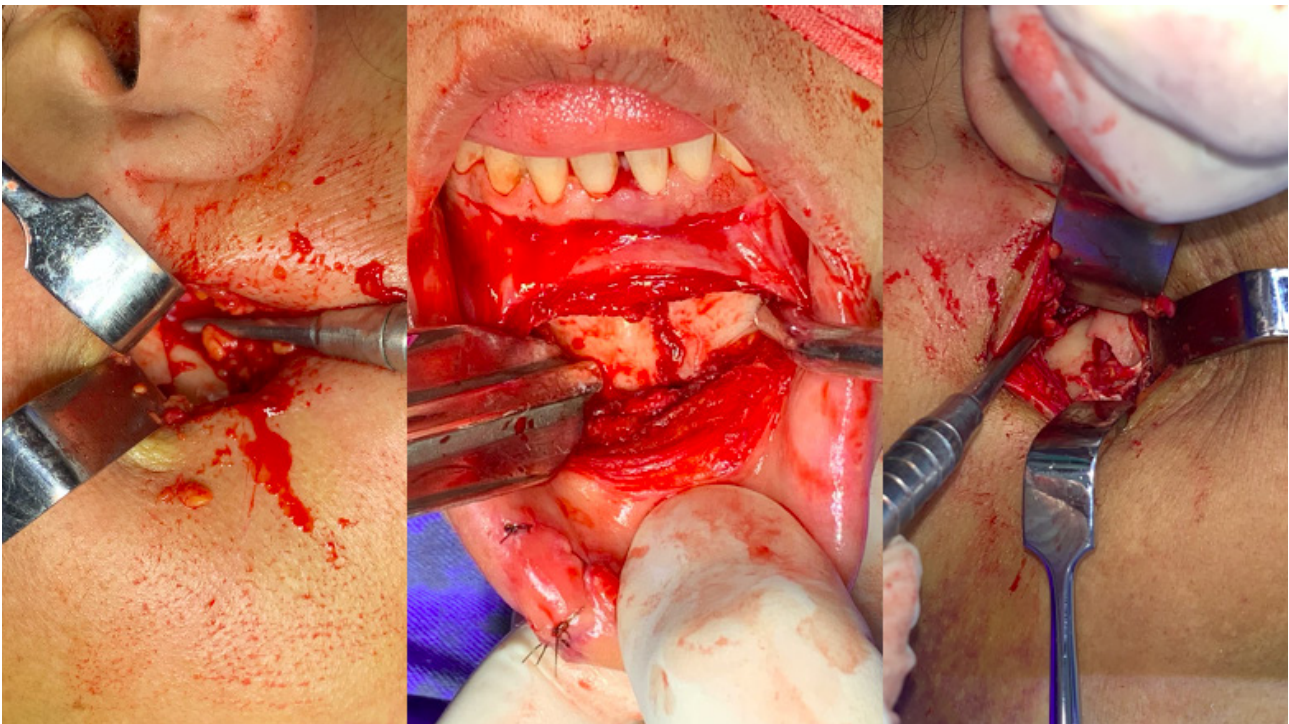


Figure 2 - Surgical approaches performed to access mandibular fractures.

This was followed by a maxillomandibular block after exposure to the fractures. For osteosynthesis, a 2.0 titanium fixation system was used. Each mandibular condyle was fixed with 02

straight divergent plates and monocortical screws. Two straight titanium plates were also used for the reduction and fixation of the mandibular symphysis fracture (Figure 3 and Figure 4).

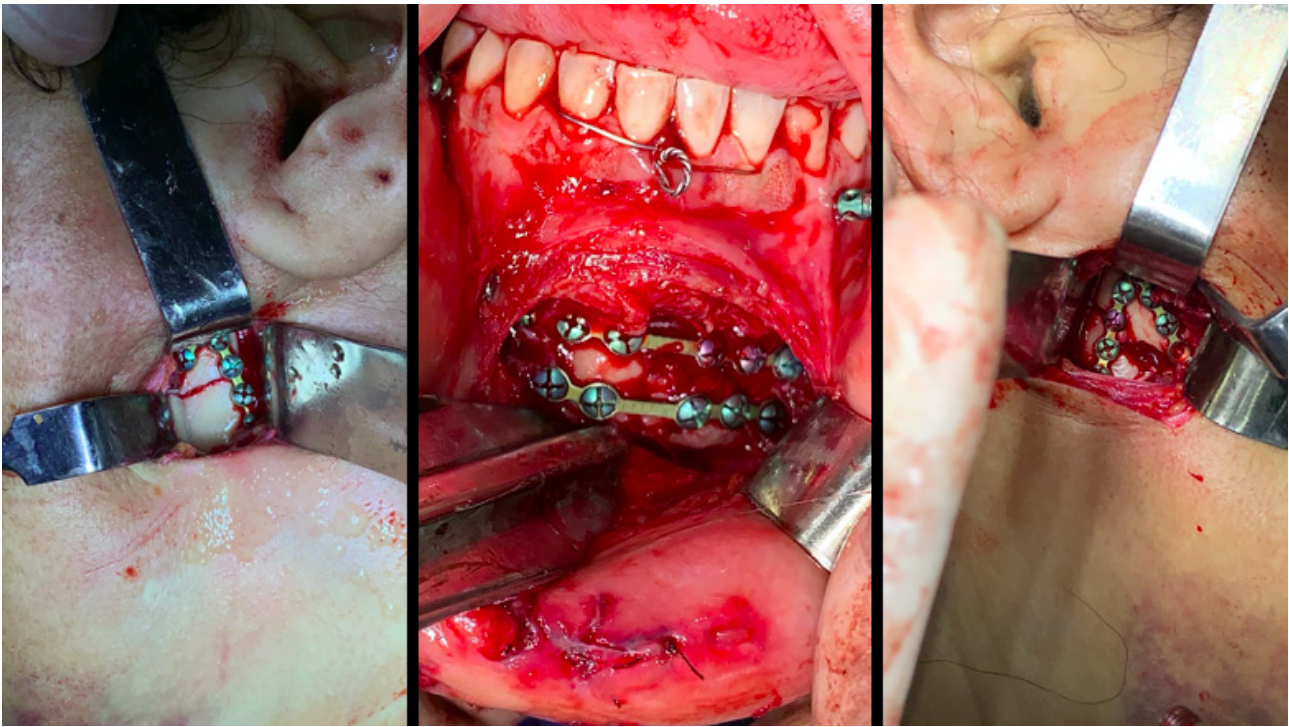


Figure 3 - Surgical approaches performed to access mandibular fractures with osteosynthesis material already fixed.

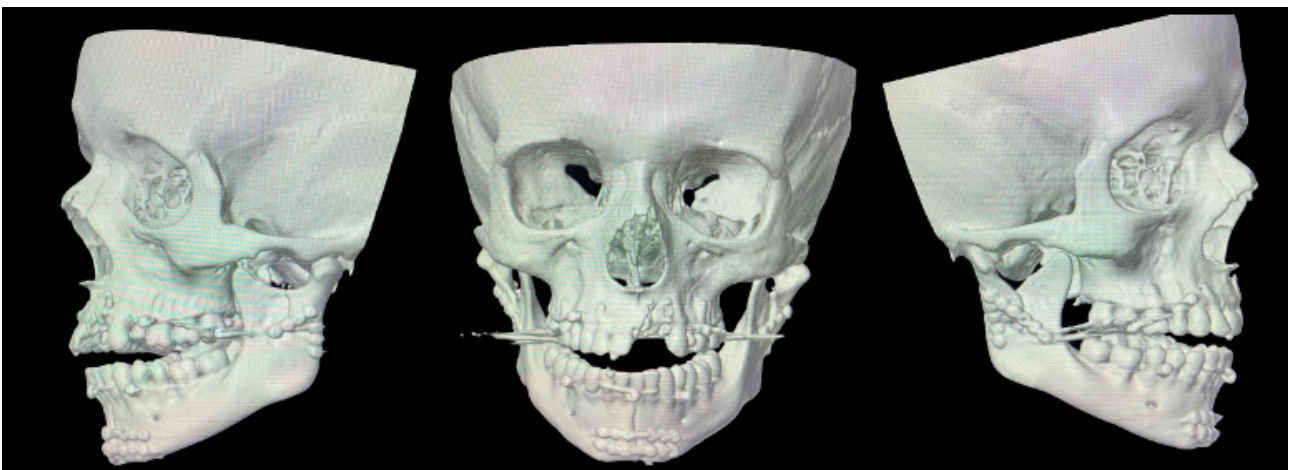


Figure 4 - 3D Postoperative tomography showing osteosynthesis of mandibular fractures.

After osteosynthesis of the fractures, hemostasis was performed with electrocautery, abundant irrigation with 0.9% saline, and synthesis by planes with vicryl 4.0 in the musculature and intra-oral access, closing the skin with nylon 5.0 for the retromandibular accesses. Compressive dressing with gauze, micropore, and bandage was applied and maintained for 72 hours.

The patient remained hospitalized in the unit until the 3rd POD. During this period, she was using antibiotic therapy with Cefazolin 1g 06/06h, analgesia, and venous anti-inflammatory, being discharged the next day, with an oral prescription. On the 10th postoperative day, all skin sutures were removed, with no phlogistic signs. The patient continues to be followed up, progressing without complications, with total regression of the edema,

good mouth opening, reproducible and satisfactory dental occlusion, without sequelae of the trauma both in the aesthetic and functional scope.

DISCUSSION

In general, the literature seems to reach a consensus regarding etiology, sex, age, fracture patterns, and clinical and radiographic findings of mandibular fractures. Nogami et al ⁶ in their study, pointed out that mandible fractures as the most prevalent. In cases with a single mandible fracture, the symphysis was the most affected site, while in those with multiple fractures, the association of bilateral symphysis and condyle fractures was the most common.

Al-Bokhamseen, Salma, and Al-Bodbaj⁷ in a 2019 study reported that traffic accidents and falls were the main causes of facial trauma, with a higher prevalence in young males. In view of this, the present reported case is in agreement, with the causality of the trauma, age, and fracture pattern similar to those described in the literature, differing only in sex.

The most frequently found signs and symptoms are pain, limitation of mandibular movements in general, occlusal disarrangement, loss of ramus height uni or bilaterally, bone mobility, crepitus, and TMJ changes.^{8,12,3} In the present case, the patient presented pain, occlusal dystopia, trismus, and loss of ramus height bilaterally, with depression in the TMJ region. Condylar fractures associated with symphyseal or parasymphyseal fractures represent a case of challenging resolution and the choice of surgical or non-surgical treatment for fractures of the condylar process is still a controversial issue in the field of oral and maxillofacial traumatology.^{12,9}

Sriraam and Vignesh³ state that conservative therapy remained the main mode of treatment of mandibular condyle fracture for many years. This is now overshadowed by surgical therapy due to increased surgical experience and the advent of new technological advances in both instrumentation and radiological diagnosis. Open reduction and internal fixation help in faster restoration of form and function, so the patient is rehabilitated in a shorter period of time. In the present reported case, an ORIF surgical approach (open reduction with internal fixation) was chosen for all fractures, using a titanium 2.0 fixation system.

For Ramos et al⁹, an important factor is the fixation sequence, since reducing and fixing the symphysis initially may compromise the correct fixation of the condyle, especially when this anatomical structure is fixed with a single plate. This is justified by the fact that condylar fixation prior to symphysis fracture restores mandibular width and properly repositions the mandible. In the case addressed in the present report, maxillomandibular blocking was performed after exposure of the fractures, and the mandibular condyles were fixed with straight plates and monocortical screws, with the aim of stabilizing the fractured stumps and minimizing the possibility of failure of the fixation system. Finally, straight titanium plates were used for the reduction and fixation of the mandibular symphysis fracture.

Al-Moraissi et al.¹⁰ and Rozeboom et al.¹¹ say that the surgical approach with extraoral access presents a higher risk of post-surgical complications, with a high incidence of facial nerve and

attached parotid gland injury, with the presence of permanent scarring in the pre-auricular and submandibular region, occurrence of Frey's syndrome, salivary fistula, sensory disturbances of the auricular nerve and sialoceles, with higher cost and length of stay for the patient. In the reported case, retro-mandibular access was used, but the patient evolved without complications and without sequelae, both in the aesthetic and functional scope. The choice of the best treatment method must be made on a case-by-case basis and according to the surgeon's experience.¹²

CONCLUSION

It is a fact that treatments for mandibular condyle fractures are challenging, considering the complexity of the trauma, especially when associated with other types of fractures. In the case presented, in addition to the bilateral fracture of the condyle, the patient had a fracture of the symphysis, which made the conduct to be adopted to restore her occlusion and the transverse dimensions of the mandibular arch more cautious.

When performing good surgical management, the chances of the patient developing sequelae of the trauma are reduced, having a good prognosis in the aesthetic and functional scope.

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