

Urgent surgical approach for comminuted mandible fracture and considerations regarding airway risk. Case report

Abordagem cirúrgica urgente para fratura cominutiva da mandíbula e considerações sobre o risco das vias aéreas. Relato de caso

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Abstract

Introduction: Jaw fractures are one of the most common sites of maxillofacial injuries. The location of the jaw makes it very vulnerable to direct impacts. The purpose of treatment is to restore aesthetic function. **Case Report:** The purpose of this report is to present a case of comminuted mandible fracture in a young male patient, treated urgently due to the need for maintenance of the airways, where fracture osteosynthesis surgery was submitted. **Conclusion:** The initial assessment of these trauma patients should follow the Trauma Life Support protocol, and structural damage should be investigated. **Introduction:** Jaw fractures are one of the most common sites of maxillofacial injuries. The location of the jaw makes it very vulnerable to direct impacts. The purpose of treatment is to restore aesthetic function. **Case Report:** The purpose of this report is to present a case of comminuted mandible fracture in a young male patient, treated urgently due to the need for maintenance of the airways, where fracture osteosynthesis surgery was submitted. **Conclusion:** The initial assessment of these trauma patients should follow the Trauma Life Support protocol, and structural damage should be investigated.

Keywords: Fractures Comminuted. Intubation Intratracheal. Mandible.

Resumo

Introdução: As fraturas de mandíbula são um dos locais mais comuns de lesões maxilofaciais. A localização da mandíbula a torna muito vulnerável a impactos diretos. O objetivo do tratamento é restaurar a função estética. **Relato de Caso:** O objetivo deste relato é apresentar um caso de fratura cominutiva de mandíbula em paciente jovem do sexo masculino, atendido com urgência devido à necessidade de manutenção das vias aéreas, onde foi submetido cirurgia de osteossíntese da fratura. **Conclusão:** A avaliação inicial desses pacientes com trauma deve seguir o protocolo do Suporte de Vida no Trauma, e devem ser investigados danos estruturais.

Palavras-chave: Fraturas Cominutivas. Intubação Intratraqueal. Mandíbula.

INTRODUCTION

Mandible fractures are one of the most common sites of maxillofacial injuries^{1,2}. The location of the mandible makes it very vulnerable to direct impacts^{2,3}. Within the mandible, the most prevalent sites are mandibular angle, condylar region, symphysis, body, ramus, and coronoid process⁴. The main promoters of this kind of injury is assault, motor vehicle accident, and fire weapons^{1,4,5}. The incidence shows that males are more stricken than females and most patients are from the early adult life (18-25 years)⁵.

The kind of impact can dictate the damage to the bone². Low-energy impacts usually conduct to a linear fracture line, with no displacement. High-energy impact, such as car accidents or fire weapon projectiles, can lead to complex, displaced, and comminuted fractures³. The goal of treatment is to re-establish patient dental occlusion⁵. The initial evaluation of

these trauma patients has to be according to the Trauma Life Support protocol and damage to other structures should be investigated, such as C-spine injury and styloid process fracture, and active hemorrhage^{6,7}.

The objective of this case report is to show a case of comminuted mandible fracture in a young male patient, treated as an emergency due to the need to maintain the patient's airway.

CASE DESCRIPTION

A male patient, 25 years, was brought from the emergency service to the Uberlândia Federal University Hospital due to an automobile accident. At the time of admittance, there was no loss of conscience and he was wearing a cervical collar with active bleeding in the face. His airway was compromised

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due to the abundant blood loss and the patient has had trouble breathing, so emergency intubation was done. Clinical examination showed multiple lacerations, intra and extra oral bleeding, epistaxis, bilateral periorbital edema and hematoma, dentoalveolar fragment, and maxilla mobility. The patient underwent an initial computed tomography exam that showed a comminuted fracture of the mandible, and a Le Fort I and II fracture (Figure-1A, B and C). The fractures were stabilized and the open wounds were sutured. To avoid infection, 7 days of antibiotic therapy was performed.

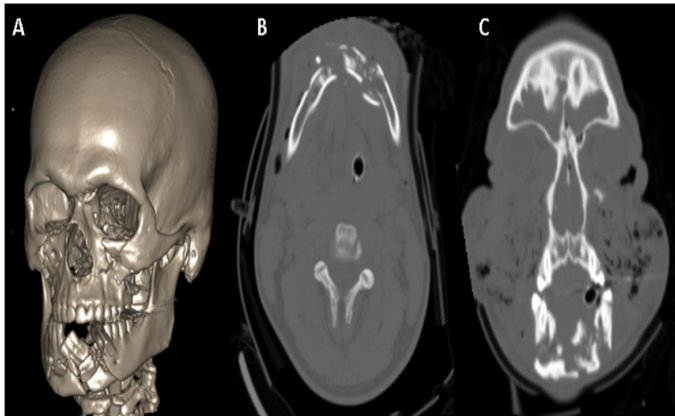


Figure 1- (A) 3D computed tomography reconstruction showing comminuted anterior mandible fracture (B) Axial section of computed tomography window for bone tissue showing the comminuted fracture of the mandible. (C) Coronal section of computed tomography window for bone tissue showing the level of mandibular involvement

After stabilization, the patient was submitted to a surgical procedure of open reduction and internal fixation of the fractures. Under general anesthesia, we installed a maxillomandibular fixation so the occlusal pattern could be preserved. Then, the infra-orbital fractures were accessed, reduced, and fixed with semi-lunar plates of the 1.5 system. The zygomatic and canine pillar was accessed intraorally, reduced, and fixated next. In the maxilla fracture, the 2.0 system L-plate was used to perform fixation. The comminuted jaw fracture was accessed and simplified using the 2.0 system (Figure 2A and 2B). Then we build a template to bend the reconstruction plate. It has seventeen holes; we used two locking screws of 12mm, three standard screws of 12mm, and four standard screws of 14mm (Figure-2C). After the open reduction and internal fixation were done, we removed the maxillomandibular fixation and the patient was carried to the recuperation site.

The patient remained three days in the intensive care unit, showed significant improvement, being referred to the infirmary. At discharge, amoxicillin 500mg three times a day for 7 days, dexamethasone 4mg twice a day for 3 days, and dipyron sodium 500mg three times a day for 3 days was prescribed. The patient remained on periodic outpatient visits for sixty days, progressing satisfactorily, without complaints. Soon after the final postoperative radiography was performed (Figure-3A and 3B), the patient was referred for outpatient discharge.



Figure 2(A) Trans-operative, the comminuted fracture accessed. (B) Trans-operative, the simplification of the fracture using load-sharing plates. (C) Trans-operative, after the installation of the reconstruction plate.

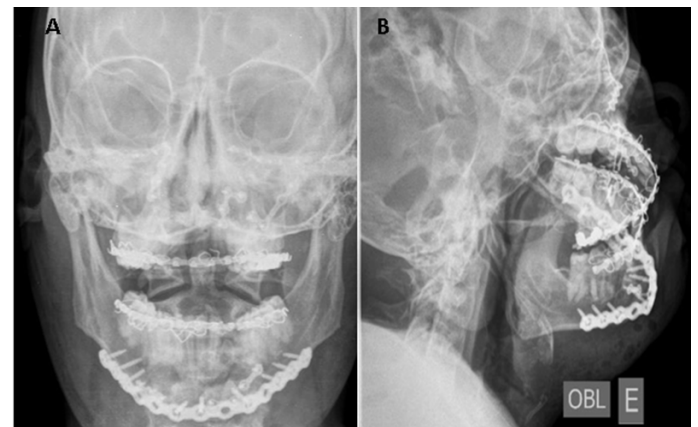


Figure 3 – (A) Antero-posterior radiography of the face. (B) Left oblique radiography of the mandible.

DISCUSSION

In mandible fracture management, the surgeon has to be aware of some potential complications. The first one is freeing the airway^{4,8}. Due to bleeding and edema, is quite often the loss of airway integrity^{1,4,8}. To solve this issue, early oral intubation should be considered. If there is too much bleeding or anatomical difficulty, the tracheostomy can be the best technique^{4,8}. In the case reported, our patient showed active bleeding difficulty to breath, so early intubation was performed. This procedure protected the airway, helped its maintenance, and favor care during hospitalization. Other situations that always have to be investigated are spinal cord injury, cervical spine fractures, styloid fracture, and vertebral artery injuries^{6,7}.

3 Predator preferences: a key to effective biological control design

The lower third of the facial injuries were previously associated with these traumas. These situations are serious and can cause high mortality, neurological morbidity⁶. For these analyses, an initial computed tomographic has become the gold standard for fracture evaluation and diagnosis⁵. We did not identify any of the previously described situations in our patient.

There are two common approaches for mandible fractures. The conservative method in which the patient has nonsurgical management and the open reduction and internal fixation of the fractures^{2,5,7}. For the conservative approach, the fractures have to be stabilized without accessing the fragment, often achieved with long use of maxillomandibular fixation and cooperation of the patient^{3,9,5}. In comminuted cases, the lack of fragment stabilization could lead to infection and chronic inflammation, difficulting the healing process³. The open reduction and internal fixation approach evolve a surgical procedure to access the bone and fixate the fragments using wires, screws and plates^{3,5,10}. This method provides better restraint of the

fragments, avoids the long use of maxillomandibular fixation, and lowers the healing time^{1,3}.

In this case, we treated the patient with the open reduction and internal fixation method. First, we used load-sharing fixations in the comminuted site to link and fixate the comminuted bone fragments; avoiding movement between them. After this, the load-bearing reconstruction plate fixates the mandible as a whole permitting the correct stabilization of the fracture. The patient left the surgical center without maxillomandibular fixation and had no post-operative complications.

COMPLIANCE WITH ETHICAL STANDARDS

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