

Surgical approach to facial trauma caused by work accident with a grinder: case report

Abordagem cirúrgica de trauma facial por acidente de trabalho com retificadora: relato de caso

DOI:10.34117/bjdv7n2-600

Recebimento dos originais: 10/01/2021

Aceitação para publicação: 26/02/2021

Lorena Mendes Almeida

Dentistry from the Federal University of Uberlândia

Institution: Federal University of Uberlândia

Address: Av. Pará, 1748 - Umuarama, Uberlândia - MG, 38405-320

E-mail: lorenamalmeida@outlook.com

Izabella Sol

Resident in Oral maxillofacial surgery at Hospital de Clínicas, Universidade Federal de Uberlândia

Institution: Federal University of Uberlândia

Address: Av. Pará, 1748 - Umuarama, Uberlândia - MG, 38405-320

E-mail: izabella.sol@hotmail.com

Cristóvão Marcondes de Castro Rodrigues

Resident in Oral maxillofacial surgery at Hospital de Clínicas, Universidade Federal de Uberlândia

Institution: Federal University of Uberlândia

Address: Av. Pará, 1748 - Umuarama, Uberlândia - MG, 38405-320

E-mail: cristovao-marcondes@hotmail.com

Daniela Meneses-Santos

Resident in Oral maxillofacial surgery at Hospital de Clínicas, Universidade Federal de Uberlândia

Institution: Federal University of Uberlândia

Address: Av. Pará, 1748 - Umuarama, Uberlândia - MG, 38405-320

E-mail: danyymeneses@yahoo.com.br

Luana Soares Vasconcelos

Resident in Oral maxillofacial surgery at Hospital de Clínicas, Universidade Federal de Uberlândia

Institution: Federal University of Uberlândia

Address: Av. Pará, 1748 - Umuarama, Uberlândia - MG, 38405-320

E-mail: luanasvasc@gmail.com

Vinicius Lima de Almeida

Resident in Oral maxillofacial surgery at Hospital de Clínicas, Universidade Federal de Uberlândia

Institution: Federal University of Uberlândia

Address: Av. Pará, 1748 - Umuarama, Uberlândia - MG, 38405-320

E-mail: viniciusl.dealmeida91@gmail.com

Jonas Dantas Batista

PhD in Oral maxillofacial surgery at the Pontifical Catholic University of Rio Grande do Sul - PUCRS

Institution: Federal University of Uberlândia

Address: Av. Pará, 1748 - Umuarama, Uberlândia - MG, 38405-320

E-mail: jonasdantasbat@gmail.com

Cláudia Jordão Silva

PhD in Oral maxillofacial surgery by the Faculty of Dentistry of Piracicaba - UNICAMP

Institution: Federal University of Uberlândia

Address: Av. Pará, 1748 - Umuarama, Uberlândia - MG, 38405-320

E-mail: cjordao1@gmail.com

RESUMO

A face é uma das regiões mais importantes do corpo e por meio dela o ser humano se expressa, demonstra sentimentos e se relaciona socialmente, além de realizar funções essenciais para sua sobrevivência como enxergar, falar, se alimentar, entre outras. O trauma facial penetrante é um agravo que acomete esta região corporal e, a depender de sua etiologia e gravidade, pode trazer grandes prejuízos à vítima, podendo ser até mesmo fatal. Tal evento acomete majoritariamente pessoas do sexo masculino, com idade entre 19 e 40 anos, suas principais causas são acidentes automobilísticos, agressões interpessoais e acidentes de trabalho. As características intrínsecas do objeto que ocasionou o trauma, como tamanho e forma, juntamente com a direção em que ele atinge a face, influenciam diretamente na gravidade do acidente e nas lesões causadas. É de extrema importância o rápido atendimento inicial, para estabilização do paciente; correto diagnóstico e tratamento das lesões em tecido mole e fraturas ósseas, para restabelecer a anatomia perdida e devolver função e estética à vítima, proporcionando qualidade de vida pós-trauma. Este relato de caso descreve um trauma facial em paciente de 40 anos, causado por acidente de trabalho com esmerilhadeira; abordando seu diagnóstico, tratamento e acompanhamento pós-operatório.

Palavras-chave: Mandíbula, Maxila, Acidente de trabalho, Osteossíntese, Cirurgia.

ABSTRACT

The face is the one of the most important parts of the body and through it the human being expresses himself, manifestate feelings and acts socially, in addition to essential functions for his life such as seeing , speaking, eating . Penetrating facial trauma is a condition that affects this body part and, depending on its etiology and severity, can cause great damage to the victim , and can even be fatal. This event affects mostly male people, aged between 19 and 40 years, its main causes are car accidents, interpersonal aggressions and work accidents. The object characteristics that caused the trauma, such as size and shape, with the direction in which it hits a face, directly influence the severity of the accident and the caused injuries. Fast initial assistance is extremely important to stabilize the patient; correct diagnosis and treatment of soft tissue injuries and bone fractures, to restore lost anatomy and restore function and aesthetics to the victim, providing post-trauma quality of life. This case report is about a facial trauma in a 40-year-old patient after a work accident with a grinder; addressing its diagnosis, treatment and postoperative follow-up.

Keywords: Mandible, Maxilla, Accidents occupational, Fracture Fixation, Internal, Surgery.

1 INTRODUCTION

Penetrating facial traumas are dangerous and can be fatal, as noble structures are located in the region of the face, which if injured represent a threat to life ^{1,11}. This makes the treatment of this type of accident challenging and requires caution on the part of the care team, with an adequate initial approach that guarantees the stabilization of the patient, by maintaining vital signs essential ².

The correct diagnosis of fractures guarantees the establishment of an adequate treatment plan and a good prognosis ^{1,3}. In this step, a detailed physical examination should be performed, by palpation and observation of the facial anatomical structures, investigating changes in normal hard and soft tissues. Still, imaging exams, such as Computed Tomography, allow a better assessment of the case through the visualization of structures and possible injuries, also allowing comparison after the treatment has been performed ⁴.

Surgical intervention must be performed according to the characteristics of the wound: its cause and time elapsed until the first visit, its dimensions, compromise or not of noble structures and airways, degree of contamination and possibility of infection. The next steps are the fixation of bone fractures and outpatient follow-up until complete recovery. Adequate treatment is of significant importance, because when this type of injury is poorly managed, it can leave sequelae that directly interfere in the individual's social life, subjecting him to a marginalized social life that directly interferes with his work capacity and exclusion in work environment leads to economic prejudice ^{5,6}.

Studies indicate that male people, aged between 19 and 40 years, are the main victims of this type of injury and it is more common to have only one soft tissue injury per victim. Its causes are generally interpersonal aggressions and car accidents, but work accidents are also capable of generating significant trauma in the maxillofacial region ^{3,5,11}.

This article aims to report a case of an accident at work with a young male patient who suffered facial fractures associated with complex facial laceration.

2 CLINICAL CASE

Male patient, 40 years old, melanoderma, victim of a work accident by grinding machine on 08/06/2020 was taken to the Surgery and Traumatology service of the Hospital de Clínicas of the Federal University of Uberlândia - Minas Gerais - Brazil,

conscious, Glasgow Coma Scale 15 and not referring to systemic comorbidities or allergies.

On physical examination, extensive laceration and abrasions were found on the lower third of the face on the right side (Figure 1). In the intraoral clinical examination, avulsion of teeth 12, 14, 43 and 44 was observed; element 44 had transfixed the oral mucosa in the region of the lacerations on the face; coronary fracture of teeth 15 and 45; gingival lacerations in the region of the elements avulsionados and fractured (figurative 2). The tomographic examination revealed a fracture of the right parasymphysis, a dentoalveolar fracture in the first and fourth quadrants and a fracture of the right maxillary zygomatic pillar (Figures-3).

On the same day as the initial visit, the patient underwent general anesthesia to install Erich's bar, suture of intra and extraoral lacerations, multiple extractions of the fractured elements and maxillomandibular block. This approach was adopted aiming at a later approach to fix bone fractures.

An evaluation by the plastic surgery team was requested to discuss the cortico-lacerative wound and the possible postoperative complications of mandibular fracture correction. The opinion issued advised an early approach and the team made themselves available for a combined procedure after the fracture was approached, if necessary. He also guided the maintenance of a collagenase dressing until the date of the surgical procedure.

After better conditioning of the soft tissues, the patient was again submitted to general anesthesia to fix the fractures. Intra-oral access was performed in the maxillary region (Figure-4A) and extra-oral access for mandibular body fractures (Figure 4B). The fracture of the zygomatic maxillary abutment was fixed with an L-shaped plate of the 2.0 system and the mandibular fracture was fixed with a straight plate with six holes and a straight plate with four holes of the 2.0 system (Figures 5 and 6). Debridement of the extraoral suture was performed without the need for new sutures, the dressing with collagenase was maintained and the patient received recommendations for cleaning and changing it once a day.

At hospital discharge, the patient received Amoxicillin 500mg every 8 hours for 7 days as home prescription, Dexamethasone 4mg every 12 hours for 3 days, Sodium Dipyron 500mg every 6 hours for 3 days and an extra wound dressing change - oral once a day.

On weekly outpatient visits, the patient presented a satisfactory evolution without pain complaints, stable occlusion, absence of surgical holiday dehiscence and with an adequate healing of the extra-oral wound without healing contractions, maintenance of adequate hygiene and the exchange of extra-oral dressings.

After sixty postoperative days, the patient underwent extra oral control radiographs (Figure-5), where an adequate consolidation of the fractures of the maxilla and mandible was found, the blunt cut of the face region was very satisfactory considering the conditions initials (Figure-6); then the e rich bar was removed and the patient was discharged on an outpatient basis.

3 DISCUSSION

The epidemiology of facial trauma indicates that your principal causes are traffic accidents, interpersonal violence; its main victims are men aged between 19 and 40 years. In addition, studies indicate that the jaw is one of the main affected regions of the face. In the case reported, there was a work accident caused by an instrument with a high capacity to perforate soft tissues, but it still corresponds to the epidemiology in terms of age and facial location most affected^{1,3,4,11}.

The wound face may be treated under anesthesia Local or general. The anesthesia site is used in the majority of cases, being the drug of first choice the hydrochloride of lidocaine at concentrations of 0.2%, without or with vasoconstrictor, which usually is epinephrine. The use of vasoconstrictors aims to reduce the bleeding, delay the absorption and prolonging the effect of anesthetic, and the techniques of blocking regional and infiltrative terminal the most adopted⁵.

A study published by Vieira *et al.* (2013)⁶ indicated that the occurrence of only one soft tissue lesion is more common in cases of facial trauma and the frontal region is more affected. This patient had only one lesion, but it was located in the region of the lower lip and chin, due to the direction in which the face was affected and the sharp nature of the instrument that caused the accident.

Several factors influence the damage caused by the trauma, among them are the intrinsic characteristics of the object that caused the injury. The grinder is a tool used to cut materials solids into smaller pieces, is therefore an object having a cutting blade with very sharp edges which work under a high number of revolutions per minute. When reaching a region of the face, this equipment can cause

serious damage to the victim and, depending on the location reached, even cause a fatality ^{7,8}.

In injuries accidental, as the present report, it is preferable to suture by points simple and separated, using points simply reversed the plans deep in order to avoid the tension of the suture end of the skin. For the plans deep, gives If preferably the wires absorbable, as the Monocryl ® 3-0 or 4-0, as they, in the skin, use -If wires nonabsorbable, as the Mononylon ® 5-0 and 6-0. The points of sutures must be performed near the edges of the wound and not should cause voltage tissue, which can result in ischemia and scarring perpendicular to the wound, by necrotic tissue in the area contained by the wire ⁹.

Still, it is important to highlight the possibility of infection and the occurrence of tetanus because the sharp objects are commonly contaminated and take microorganisms into the wound at the moment of impact. For this reason, there is a need to check the patient's vaccination history and establish drug prophylaxis to prevent infections ¹⁰. In this case, the patient received cefazolin 500 mg 3x day during the hospital stay and received tetanus vaccine due to lack of knowledge of the vaccination history.

4 CONCLUSION

The care home to victim facial trauma of piercing should be done by one team multidisciplinary and is essential to ensure good prognosis. The objective main of this service is to stabilize the patient, perform cleaning of wounds and suture the lacerations of tissue soft. The team of surgery maxillofacial should be able to perform the correct treatment of changes in the face, giving priority to the welfare of the patient in the execution of procedures to restore functionality and aesthetics of the areas affected.

REFERENCES

1. Moura MTF, Daltro RM, Almeida TF. Facial trauma: a systematic review of the literature. *Rev Odonto*. Sep / Dec 2016; vol. 21, n. 3, pp. 331-337. ISSN 1413-4012.
2. Trials S, Geraldo AHPS, Oku AT, Junior WP. Facial trauma: Stab wounds. Case report. *Dentistry Journal of the University of the City of São Paulo*. 2017 Sep-Dec, 29 (3): 305-11 doi: 10.26843 / ro_unicidv2932017p305-311
3. Carvalho TBO, Cancian LRL, Marques CG, Piatto VB, Maniglia JV, Molina FD. Six years of facial trauma care: an epidemiological analysis of 355 cases. *Bras J Otorrinol* 2010; 76 (5): 556-74
4. Silva HR, Melchiorretto EF, Batista OS, Colombo MCSS. Epidemiological profile of dental and facial trauma in Curitiba. *Arch Oral Res* 2011; 7 (3): 267-73. doi: 10.7213 / aor.v7i3.23096
5. Bar-Meir E. et al. Nitrous Oxide Administered by the Plastic Surgeon for Repair of Facial Lacerations in Children in the Emergency Room. *Plast Reconstr Surg*. 2005. 117. (5) 1571-1575 DOI: 10 .1097 / 01.prs.0000206298.71083.
6. Vieira CL, Araujo DCC, Ribeiro MLS, Laureano Filho JR. Treatment of injuries long in the face resulting from trauma. Report of case. *Braz. J. Hea. Rev.*, Curitiba, v. 3, n. 3, p. 5321-5330 may./ jun. 2020 . doi: 10.34119 / bjhrv3n3-107
7. soft tissue injury in trauma patients maxillofacial -facial. *Rev Cir Traumatol Buco-Maxilo- fac* 2013; 13 (1): 89-96.
8. Vieira, CI; Araujo, DCC; Ribeiro, MLS, Laureano Filho, JR. Injury of tissue soft in patients victims of trauma buco -maxilo-facial. *Rev. cir . traumatol. buco - maxillofacial* . 2013 , 13 (1) 97-104.
9. Patel KG, Sykes JM. Management of soft-tissue trauma to the face. *Operative Techniques in Otolaryngology - Head and Neck Surgery* 2008; 19 (2): 90–97
10. Rhee P, Nunley MK, Demetriades D, Velmahos G, Doucet JJ. Tetanus and trauma: a review and recommendations. *J Trauma*. 2005 May; 58 (5): 1082-8. doi: 10.1097 / 01.ta.0000162148.03280.02.
11. Júnior, FCSS; Soares, FAF; Filho, WSS; Batista, EV. Clinical and epidemiological characteristics of patients with facial trauma: na integrative literature review. *Brazilian Journal of Development*. Vol 6, No 10 (2020). 2020, October. DOI:10.34117/bjdv6n10-133

FIGURES



FIGURE 1: Extraoral image showing the lacerations and abrasions in soft tissue in the region of the lower third of the face and the transfer of the element.

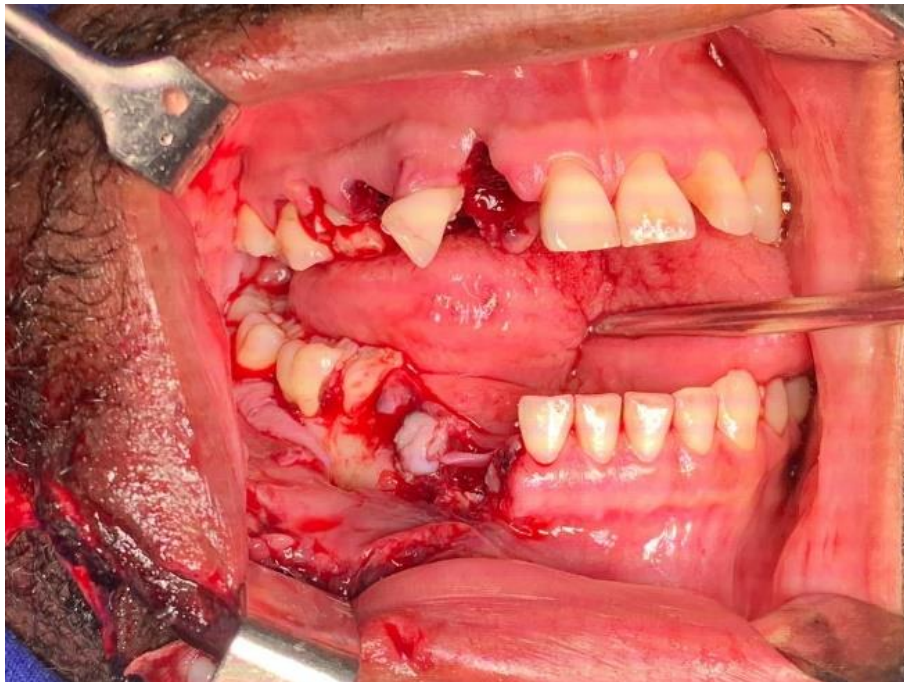


FIGURE 2: Intraoral image showing dental avulsions and fractures and lacerations in gingival tissue.

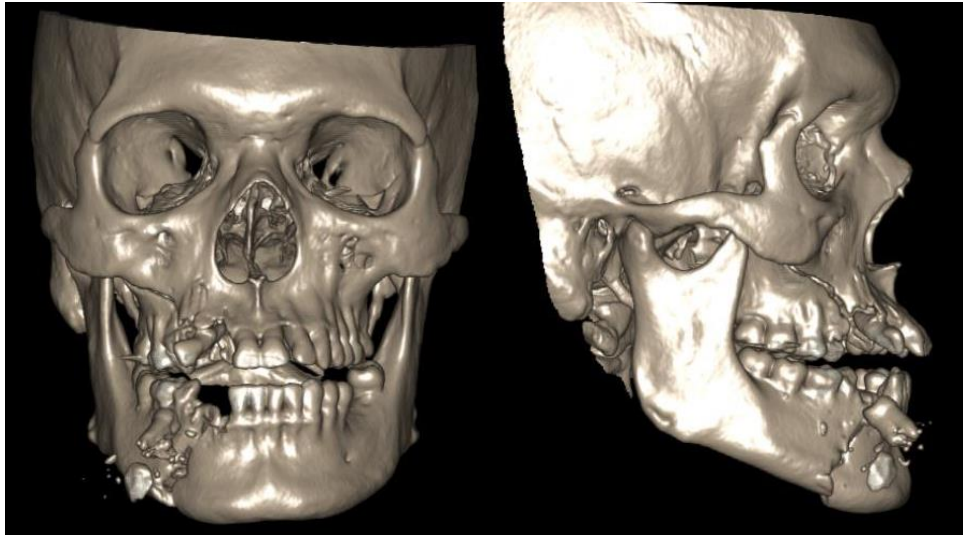
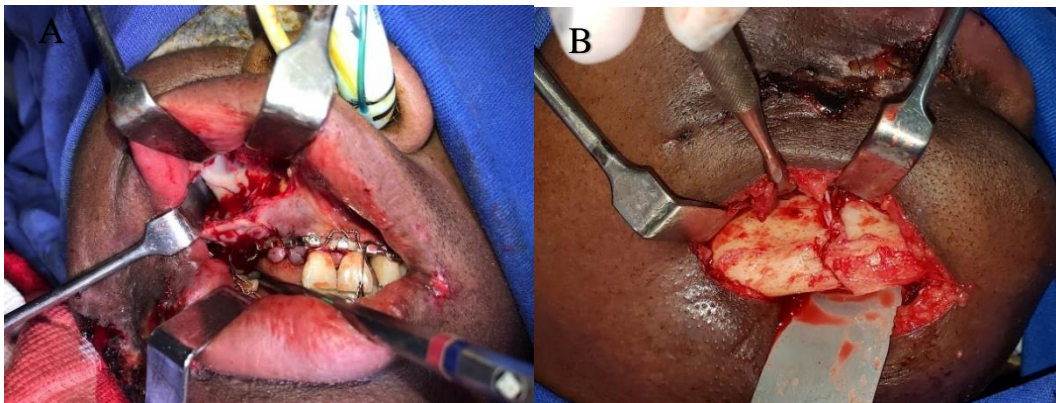


FIGURE 3: Computed tomography 3D reconstruction showing fracture of the right mandibular body and right maxilla



FIGURES 4: Trans-surgical images showing fracture in the right zygomatic maxillary pillar and fracture of the right mandibular body, respectively.



FIGURES 5: Postoperative extra-oral radiographs after fixation of facial fractures.



FIGURES 6: Scar appearance of laceration after four months of follow-up.