Case Report

Facial trauma with total maxillectomy and Z-pillar rehabilitation – Case Report

ABSTRACT

Aims: Facial trauma is one of the leading causes of mortality that affects young male adults. Its multifactorial etiology and the predominant causes are traffic accidents and physical aggression. Maxillectomy is a surgical procedure, partial or total removal of the jaw, either due to trauma or pathology (oral cancer). The surgical defect created can cause psychological, functional, and aesthetic disorders for the patient, making rehabilitation essential.
Presentation of Case: This case report is about a 45-year-old Caucasian patient who was a victim of facial trauma due to a traffic accident and underwent three hospital surgeries. Prosthetic rehabilitation was done using conventional implants anchored in zygomatic bones associated with the Z-pillar and the Facco Technique. It is a rehabilitative treatment option for total maxillectomy, as it restores aesthetics and function to the patient.
Discussion: Facial trauma represents almost 9% of emergency care in hospitals, and among the leading causes are car accidents, as occurred in the present Case Report. Maxillectomy is classified into three types (25): 1) with preservation of the orbital floor, 2) with loss of orbital support, and 3) with orbital exenteration and ethmoidectomy, as occurred in the Clinical Case Report of the present research.The Facco Technique was performed in three stages. Subsequently, the component's mini pillar was installed.
Conclusion: It can be concluded that conventional implants installed in the zygomatic bone and using the Z-pillar (Facco Technique) were a great option to rehabilitate patients who were victims of a car accident without a jawbone and reduced their treatment time. It also gave him a new chance to find his way back into society and improved his quality of life.

Keywords: Facial trauma. Jaw. Zygomatic bone.

1. INTRODUCTION

Facial trauma is the name given to any injury located on the face [1]. It is considered a public health problem in Brazil [2] and is among the leading causes of death and morbidity in the world, according to data from the World Health Organization (WHO) [3]. The etiological factors of facial fractures are multifactorial, but the most significant predominance is due to automobile accidents [4]. Studies show that the prevalence of facial trauma is higher in males [5] and young adults (18 and 40 years old) [6]; its diagnosis and treatment are carried out by the Craniomaxillofacial team [7].

Maxillectomies are classified into three types [8]: 1) preservation of the orbital floor, 2) loss of orbital support, and 3) removal of orbital contents and ethmoidectomy. The procedure results in significant aesthetic and functional defects; its consequences can be nasal speech, leakage of secretion from the nasal cavity, impairment of masticatory function, and aesthetic deformity, requiring surgical and prosthetic rehabilitation [9].

Rehabilitation is performed using the zygomatic pillar (Z-pillar) and the Facco Technique [10], which is designed and developed to reduce the difficulty of zygomatic anchorage techniques [11]. In this case, an intermediate capable of connecting the implant to the alveolar ridge was used due to the previously performed maxillectomy [12].

The Z-pillar technique consists of a zygomatic anchorage system composed of three parts [13]: a conical implant with a cone-morse connection, an initial piece of the Z-pillar, and the final piece of the Z-pillar to adjust the length of the prosthetic platform with a connection external hexagonal. The implant is installed in the zygomatic bone bilaterally [14], associated with the Z-pillar. The main advantage of this technique is the rehabilitation of edentulous jaws with no need for bone grafting, reducing the patient's treatment time [15].

2. PRESENTATION OF CASE

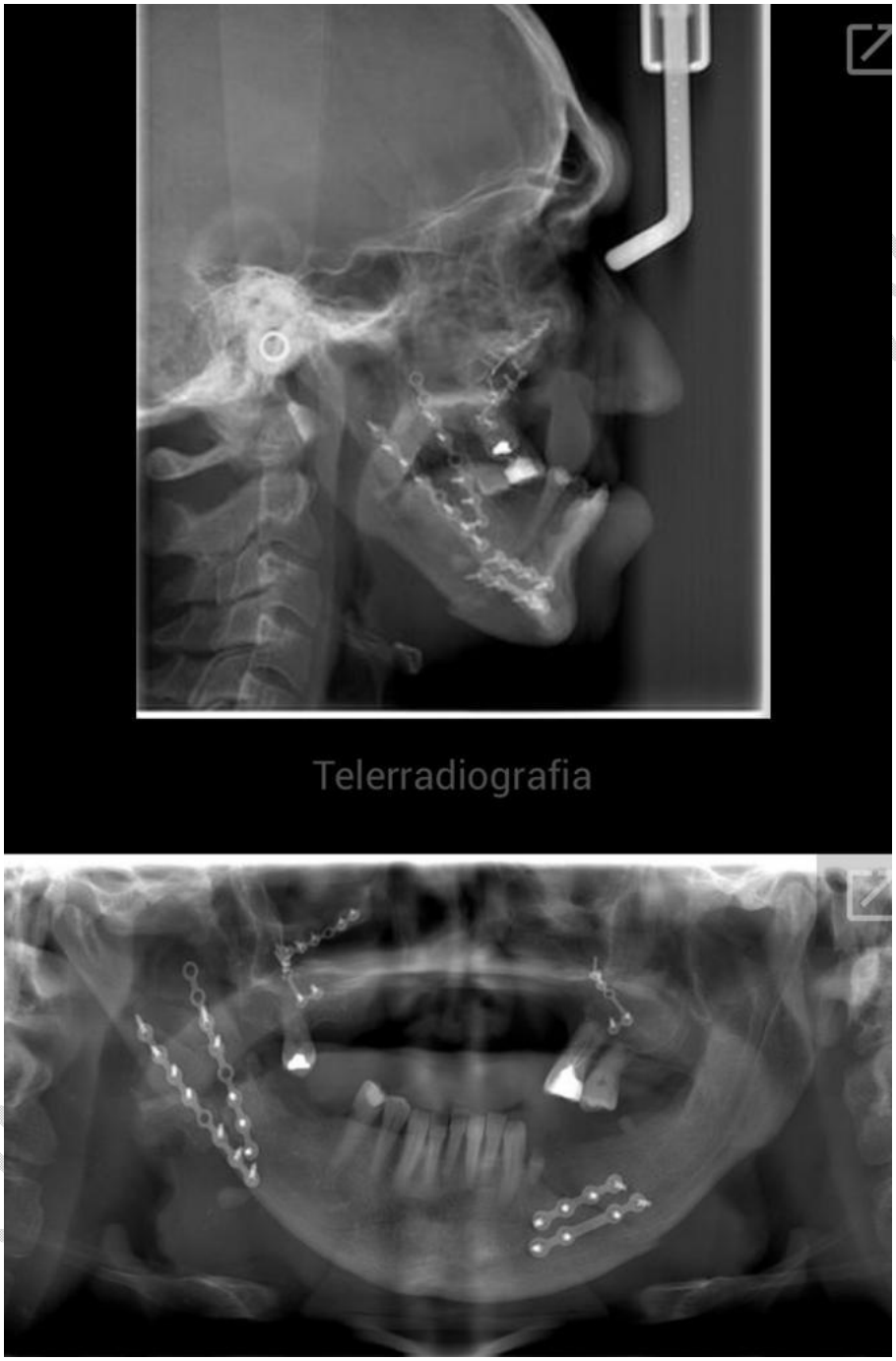
The patient was a truck driver in a traffic accident on Via Dutra in Volta Redonda, Rio de Janeiro, Brazil, in 2021. First aid was performed at the local hospital (hemostasis, facial sutures, reduction of face fractures, and maxillomandibular block) (Figure 1).

Figure 1 Emergency service (before x after surgery).

Source: Own Author

However, the maxilla was not fixed satisfactorily due to a lack of stable internal fixation material in the first hospital in Rio de Janeiro, Brazil (Figure 2), where he remained in theintensive care unit for a month and presented psychomotor agitation generated by the discontinuous use of amphetamines due to his profession (truck driver).

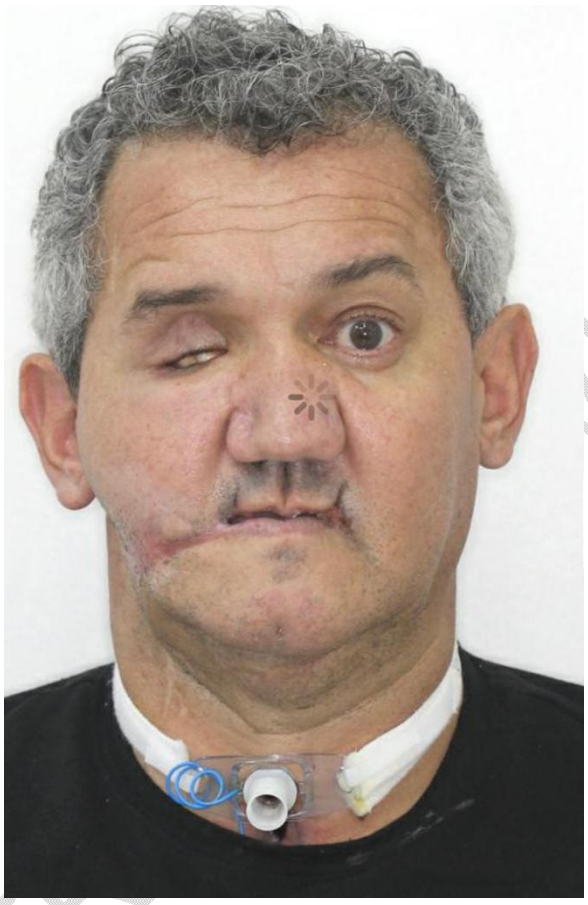
Figure 2 Unsatisfactory fixation of the jaw.



Source: Own Author

After, he was transferred to Hospital Santa Bárbara, in Santa Bárbara d'Oeste, São Paulo, Brazil, near his residence. Upon examination by a new Craniomaxillofacial team, tissue necrosis and loss of the maxilla were found, due to inadequate fixation, as well as arthrosis of the left mandibula para symphysis, pseudarthrosis of the nose (without the stability of fixation), misalignment of the orbits, and loss of the right eyeball (Figure 3).

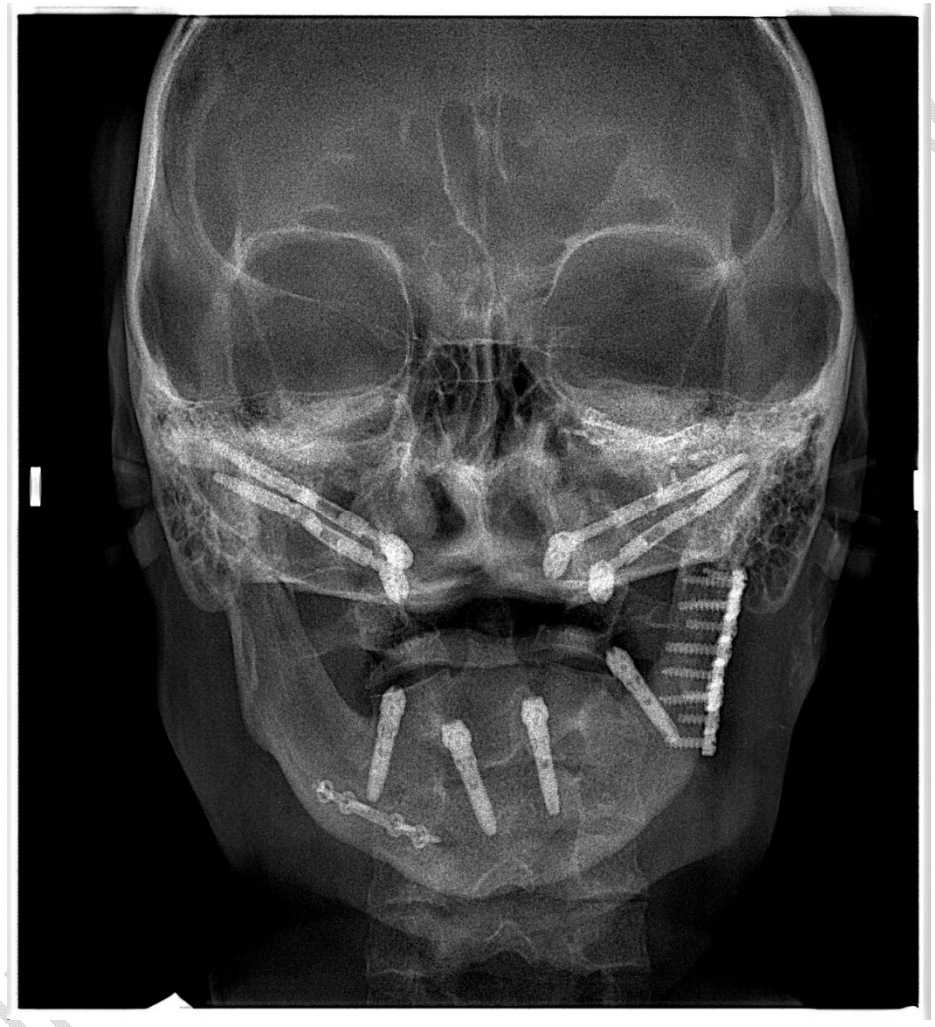
Figure 3 Arthrosis of the left mandibula para symphysis, pseudarthrosis of the nose (without the stability of fixation), misalignment of the orbits, and loss of the right eyeball.



Source: Own Author

The procedures adopted were removal of the maxillomandibular block and all previous fixation material; reduction of the sequelae of fractures with 2.4 plates (jaw body) in four surgical stages: 1) extraction of lower dental remnants; 2) placement of osseointegrated implants in the maxilla and mandible (inferior protocol), ocular enucleation and, 4) placement of mesh to support the globe eyepiece. The implants were positioned in the right and left zygomatic bone, using conventional 4x17mm morse cone implants, with 80N locking and Implacil Z-arm® – FACCO technique (with movement above 180°) (Figure 4).

Figure 4 Osseointegrated implants in the maxilla (FACCO technique) and mandible (inferior protocol).



Source: Own Author

3. DISCUSSION

Trauma appears in third place [16] as the leading cause of death worldwide, behind only cardiovascular diseases and cancer. However, when separated by age group, between 20 and 40 years old, trauma starts to lead to the statistics [17]. Facial trauma represents almost 9% of emergency care in hospitals [18], and among the leading causes are car accidents [16, 18-20], as occurred in the present Case Report. The association of alcohol, drugs, dangerous driving, and urban violence is increasingly related to the etiology of trauma [20-21].

The greater the tissue destruction of the face, the greater the sequelae, and consequently, for a good prognosis, multidisciplinary and integrated care is necessary to restore aesthetics and function [17]. Prosthetic rehabilitation restores

the physical separation between the oral and nasal cavities, normalizes speech and swallowing, and supports the lips and cheeks. It must be performed after the healing period, four to eight weeks [22].

Traumas represent the leading causes of death, as well as disability, throughout the world [23], and facial traumas are the most devastating types found in hospitals [24].

Maxillectomy is classified into three types [25]: 1) with preservation of the orbital floor, 2) with loss of orbital support, and 3) with orbital exenteration and ethmoidectomy, as occurred in the Clinical Case Report of the present research. The first form of maxillectomy can be further divided into low or high, depending on the extent of the osteotomy, respectively, below or above the infraorbital foramen.

Post-surgical jaw defects predispose the patient to nasal speech, fluid leakage into the nasal cavity, impaired masticatory function, and, in some patients, varying degrees of aesthetic and psychological deformity [21, 25].

The present case was rehabilitated with conventional implants (morse cone implants) anchorage in the zygomatic bone. The Facco Technique [10] was performed in three stages: conventional implant, intermediate 18-mm-long piece, and 15-mm-long piece to define the height of the external hexagon-type prosthetic platform [10]. Subsequently, the component's mini pillar was installed.

4. CONCLUSION

It can be concluded that conventional implants installed in the zygomatic bone and using the Z-pillar (Facco Technique) were a great option to rehabilitate patients who were victims of a car accident without a jawbone and reduced their treatment time. It also gave him a new chance to find his way back into society and improved his quality of life (Figure 5).

Figure 5 Pré final prosthetics rehabilitation.

Source: Own Author

CONSENT

The patient has informed consent for this case report to be published.

All authors declare that the patient gave written informed consentto publish this case report and accompanying images.

A copy of the written consent is available for review by this journal's Chief Editor.

ETHICAL APPROVAL

All authors declare that all experiments have been examined and approved by the Centro de Pesquisas Odontológicas São Leopoldo Mandic SS Ethics Committee, CAAE number 73491423.7.0000.5374and have, therefore, been performed following the ethical standards laid down in the 1964 Declaration of Helsinki.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

As a result, the author declares that no generative AI technologies such as large language models (ChatGPT, COPILOT, etc.) and text-to-image generators were used during the writing or editing of this manuscript.

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ABBREVIATIONS

WHO: World Health Organization.