

Rehabilitation with implants simultaneously to mandible fracture treatment. Follow up of 18 months

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ABSTRACT

Objective: This study was reduction of a bilateral mandibular fracture through the installation of dental implants with immediate loading, re-establishing the stomatognathic function of the patient. **Case Report:** A 58-year-old male patient seek the emergency room from hospital after suffering a motorcycle accident. After physical and imaging examinations was diagnosed with bilateral mandibular fracture. The treatment of choice, once the patient was edentulous, was the reduction and stabilization of the fracture with the installation of 5 dental implants with immediate loading. After 1 year of postoperative follow-up, the facial contour along with the occlusion were reestablished. Radiographically, it was found the proper placement of plates and screws with correct baseline realignment and maintenance of implant-supported prosthesis. **Conclusion:** In this case report with follow-up of 18 months, the functional prosthetic rehabilitation and immediate aesthetic with immediate loading system, after reduction and fixation of mandibular fractures proved to be a good treatment option.

KEYWORDS

Dental Implants; Fracture; Mandible.

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INTRODUCTION

The mandible can be considered the strongest and largest facial bone, but it is more susceptible to fractures due to its prominent position, mobility and anatomic configuration. The mandibular bone fractures occurring twice as frequently as fractures of the midface because of the less bone support⁽¹⁾. These injuries are mostly related to a traumatic incident including traffic accident, interpersonal violence, sport injuries and falls⁽²⁾.

The maxillofacial fractures in the elderly has increased and show characteristics depending on its etiology, patterns and treatment modalities⁽³⁾. Edentulous patients may have a higher rate of fractures of the mandibular body, which probably is due to the reduction in height and bone vascularization⁽⁴⁾.

The treatment possibilities of mandible fractures can be surgical and nonsurgical⁽⁵⁾. Surgical procedure imply open reduction and internal fixation to restore masticatory function. Open reduction is indicated, especially in displaced fractures cases⁽²⁾

The objective of mandibular fracture treatment is to re-establish dental occlusion and masticatory function. However, in edentulous patient, it is difficult to re-establish dental occlusion, and dental implants have become a good treatment approach for that. In order to reduce the treatment time, as well as patient discomfort and postoperative care, the concept of immediate loading was developed to provide a good restoration of dentition after implant placement⁽⁶⁾. This kind of treatment provides a positive psychological effect on edentulous patient⁽⁷⁾.

A bone quantity and quality in the anterior area of the mandible can be considered as a region of high success rate in immediate implant loading and it is well documented in the literature the use of four implants placed between the mental foramen associated with the immediate loading using

a fixed full-arch implant-supported acrylic resin prostheses⁽⁸⁾.

The aim of this article is to document a reduction of a bilateral mandibular fracture and dental implants installation with immediate loading during the same surgical procedure, to re-establish the stomatognathic function of the patient.

CASE REPORT

A 58-year-old male patient was attended at the emergency room of Araçatuba's hospital two days after suffering a motorcycle accident. The patient denied suffering from diabetes, immunocompromised disease, osteoporosis or smoking habits. Extraoral physical examination showed right hemifacial swelling with mandibular movements limitations. Intraoral examination showed abnormal mobility in the right mandibular body area and left mandibular angle. Through imaging exams it was diagnosed fracture at right mandibular body and left mandibular angle (Figure 1 e 2).

The treatment option, taking into account the edentulous condition of the patient was open reduction and internal fixation followed by four dental implants installation with immediate loading.

Surgical procedures were performed under general anesthesia, with nasotracheal intubation, local infiltrative anesthesia was performed in the fractures areas, using 2% lidocaine associated with epinephrine 1: 200,000, for the purpose of hemostasis. Then a trapezoidal paracrestal incision was made to expose the right mandibular body.

Then four implants (Conexão Sistema de Próteses, Arujá, São Paulo, Brasil) of 4.1x11.5mm were installed between the mental foramen, and 1 implant of 4.1x10mm was installed in the right mandibular body posterior to the fracture line, all of them with installation torque of 60 N/cm. Then the reduction and fixation of mandibular fractures was performed. The right



Figure 1. Preoperative - extra oral clinical aspect.



Figure 2. Preoperative - radiographs of the patient with a right mandibular body fracture and left mandibular angle fracture.

mandibular body fracture was fixed with 2 straight plate with 8 holes each and 16 screws, one in the tension area and one in the compression area; and left mandibular angle fracture was fixed with 1 straight plate with 4 holes and 4 screws. (Figure 3)

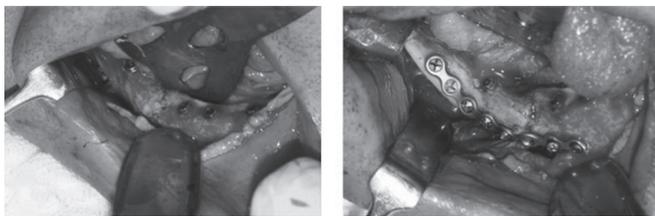


Figure 3. Trans operative – (Right). Dental implants installation; (Left) Adaptation and placement of reconstruction plate for mandibular fracture fixation.

Multifunctional transfer molding was performed after surgical suture, using a pre-fabricated guide and the index confection. Followed by the sequence of try out and preparation of implant prosthesis.

To determine dental occlusion scheme was previously evaluated the location of the implants, tissue volume dimensions, facial morphology, the intermaxillary relationship, taking into consideration the previous dental prostheses of the patient

The postoperative care included, hypercaloric and hyperproteic liquid diet and prescriptions followed the standard protocol with antibiotics (amoxicillin 500 mg every 8 hours), anti-inflammatory (ibuprofen 300 mg every 6 hours), and analgesic (acetaminophen 500 mg every 8 hours). On the third day after surgery a implant-supported prosthesis was installed, with 20 N torque.

On the 7th day post-operative, it was observed restoration of facial contours as well as the previous patient's occlusion. Radiographically was seen correct baseline realignment bone, as well as the maintenance of implant-supported prostheses.

After 6 and 18 months' post-operative the mandibular function was

maintained as well as aesthetics. Radiographically, it was observed correct contour and bone like formation in the fracture region. (Figure 4, 5 e 6)

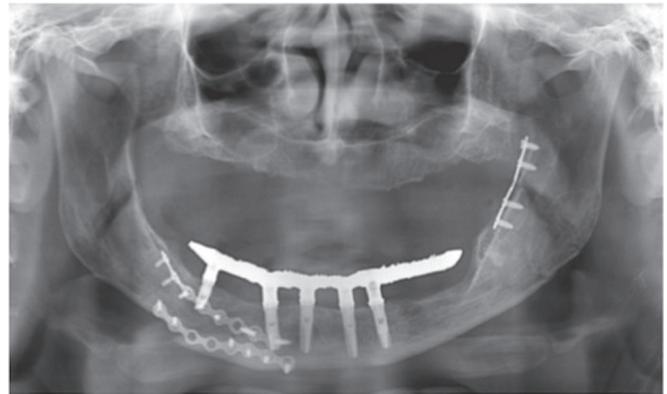


Figure 4. Six months' post-operative - Radiograph examination revealed proper plate and screws placement with correct basal realignment.

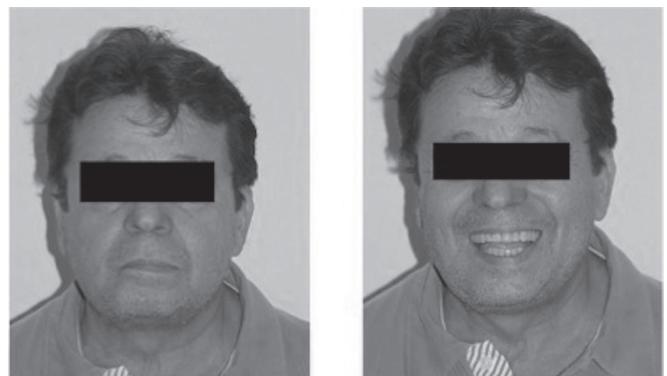


Figure 5. 18 months' post-surgery, bone and soft tissue healings were noted and no signs of mobility and/or infection in the mandibular and occlusal maintenance were observed.



Figure 6. At 18 months' post-operative, radiograph examination revealed proper plate and screws placement with correct basal realignment and good healing process, without signs of infection

DISCUSSION

The size of the alveolar crest is determined by the presence of teeth; this means that in the absence of teeth alveolar bone resorption will occur. In edentulous patient, the replacement of natural teeth for a denture does not interrupt the bone resorption process, this results, among others, increasingly difficult stabilization of the prostheses⁽⁹⁾.

The use of dental implants are accepted as a safe and predictable method to assist in cosmetic and functional rehabilitation in patients with edentulous jaws ⁽¹⁰⁾. However, in patients with severe resorption or mandibular fracture, local vascularization may be compromised, the indications for implants should be well evaluated in these patients⁽¹¹⁾. In patients with mandibular fracture, open reduction and internal fixation of

the fracture may further compromise local vascularization⁽¹²⁾.

Although the literature reports a decrease vascularization within the edentulous jaws, in special in bone fracture areas, which could present an unfavorable prognosis in cases of open reduction and internal fixation procedures, resulting in impairment of implant placement. In the case described, it was performed open reduction and internal fixation of a bilateral mandible fracture during the same surgical time, installation of implants and immediate loading prostheses, showing that this type of approach is possible.

A fact that may have contributed to the success of the treatment is the effect of immediate loading which allows the transmission of masticatory forces to the bone, and this promotes endosteal stimulation, and it can promote osteogenesis. Moreover, it stimulates the formation of new blood capillaries at the surgical site, favoring vascularization⁽¹³⁾.

Edentulous jaw fracture treated with open reduction and internal fixation with plates and screws, could be difficult, especially if longer plates and reconstruction plates are used, since the difficulty of adapt and stabilize the denture, due to this fact, the use of complementary therapy is acceptable to assist prostheses stabilization⁽¹²⁾. In view of this fact, the placement of dental implants in fractured jaws treated with plates and screws is completely correct, and the best approach to the resolution of this case.

In one case report, Romanos (2009)⁽¹⁴⁾ demonstrated the success of treating a mandible fracture using a splint bar with implants on both sides of fracture, since this bar was fixed to implants, it promoted a rigid immobilization of fracture. Along with this therapy was prescribed antibiotics and soft diet. This fact is a justification to the success of the treatment applied to the right side of the mandible fracture of the described case, because an implant was installed after the fracture line and was

joined this implant with the others installed before the fracture line with a metal bar, helping on the stability and healing of the fracture.

Immediate loading of implant supported prostheses, needs a well-adjusted occlusion to prevent implants overload, which often leads to biomechanical complications. Implants overloading prevention helps to ensure long-term stability of implant-supported prostheses⁽¹⁵⁾. In our case, the occlusal adjustment was made with great care, distributing the masticatory forces, because treatment failure could not lead only to implant loss, but lead to the failure of the entire treatment, jeopardizing the fracture stabilization.

CONCLUSION

Functional prosthetic rehabilitation with dental implants and implant-supported prostheses with immediate loading system simultaneously with open reduction and fixation of mandibular fractures proved to be a good treatment option in this case, restoring function and aesthetics of the stomatognathic system.

CONFLICT OF INTEREST AND FUNDING SOURCE

None

CLINICAL RELEVANCE

On this article it is shown a bilateral mandibular fracture reduction simultaneously to dental implants with immediate loading, to re-establish the masticatory function of the patient.

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