CASE REPORT

IMPLANT-SUPPORTED PROSTHODONTIC REHABILITATION AFTER MAXILLARY DENTOALVEOLAR TRAUMA

Venus LoranEsfahani, Abbas Monzavi

ABSTRACT

Maxillofacial trauma from mechanical type of injuries might cause anatomic deficiencies in soft and hard tissues. Successful treatment for these patients might include preprosthetic surgery using osseointegrated implants to increase prosthesis support, retention and stability. This paper reports the management of dentolaveolar trauma in a 22 year old male following a road traffic accident with implant-supported prosthodontic rehabilitation.

Key words: Maxillary,Implant,Overdenture,trauma

Introduction

Traumatic injuries are generally caused by mechanical, chemical, electrical agents, heat and radiation. Motor vehicle accidents, firearms, and falls result in mechanical types of injuries. Patients with maxillofacial defects resulting from motor vehicle accidents might have numerous soft and hard tissue injuries ranging from neurologic involvement to avulsions and/or fractures of the temporomandibular joint, maxilla, mandible, teeth and supporting structures. These defects often result in the loss of alveolar processes, reducing potential prosthesis support and requiring bone and skin grafting. Patients with traumatic defects present with lack of sufficient tooth and bone support, which limit prosthesis retention. A stable and retentive prosthesis should be useful for the patient's well-being. The loss of alveolar bone processes and prosthodontic support might necessitate the treatment of patients with removable implant-supported prostheses which have many advantages, including increased retention, stability, patient satisfaction, and the preservation of existing hard and soft tissues. This paper reports the management of dentolaveolar trauma in a 22 year old male following a road traffic accident with implant-supported prosthodontic rehabilitation.

Case Report

A 22-year-old man was referred to Tehran University Faculty of Dentistry, Department of Prosthodontics for dental rehabilitation. The history reveals he had a motorcycle accident with laceration of the right side of the face and extensive soft tissue wounds. The traumatologic urgent rehabilitation had been performed in the Tehran University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery and the left optic nerve had been avulsed. Panoramic radiograph confirmed the presence of mandibular fracture. The patient’s chief concerns were in relation to esthetics, mastication and speech. Extraoral examination revealed left facial scar tissues involving the nose, lip and cheek and left ophthalmic prosthesis. Intraoral examination revealed complete loss of left maxillary teeth and right maxillary incisors along with the associated alveolar ridge and attached mucosa. The patient’s oral hygiene was not bad. The patient had an Angle class I occlusion and acceptable vertical dimension of occlusion on the left side. Temporomandibular joints were asymptomatic, and the associated muscles were not painful. Mouth opening was normal. After completion of the medical and dental history and clinical and radiographic examination, the patient received oral hygiene instructions. The absence of alveolar ridge and vestibule made it unfavorable to fabricate a conventional removable prosthesis. Therefore, to provide retention and meet the esthetic requirements, an implant-supported maxillary prosthesis was considered and the patient accepted the suggested treatment plan. Four implants were placed in this region using a two-stage surgical protocol, wherever the alveolar bone allowed, as near as possible to the alveolar ridge (Figure 1). The patient was referred for prosthetic rehabilitation after a 46-month period to allow for osseointegration. Preliminary maxillary and mandibular impressions were made with irreversible hydrocolloid.

A maxillary custom tray was prepared using autopolymerizing acrylic resin, with holes in implant areas. After removal of cover screws, impression copings with appropriate diameters were placed (Figure 2).

The maxillary impression was made with polyether impression material. Impression copings and implant replicas were inserted into the maxillary impression. The impression was poured with type IV stone. The patient had maximal intercuspation in the right maxillary region; therefore, centric occlusion record with record bases was obtained and the casts were transferred to a semi-adjustable articulator using a face bow transfer. Artificial teeth were selected and arranged on the record bases for a trial denture arrangement, evaluating fixture positions in relation to the dental arch (Figure 3). An arbitrary setting was used to set the articulator’s condylar elements, and a balanced occlusal arrangement was achieved for the denture. The patient had a canine-protected occlusion on the right side.

Following the transfer of the positions of the artificial teeth arrangement to the silicone index, implant bar abutments were placed on the fixtures and connected with two egg-shaped bars which were cast with a gold alloy (Figure 4). Metal frameworks were cast with base metal alloy. After cast bars and metal frameworks were tried in, the tooth positions in the silicone index were transferred to the cast; the artificial teeth were arranged and the wax trial denture was then evaluated intraorally. The denture was processed and finished. Retentive titanium clips were incorporated into the denture during processing (Figure 5). An acceptable esthetic and functional result was obtained after post-insertion denture evaluations.
and adjustments (Figure 6,7). The patient was instructed in hygiene procedures associated with the denture, insertion of the bars and insertion and removal of the denture; finally, routine maintenance recalls were scheduled. No functional difficulties occurred over the 24-month follow-up period.

**Discussion**

Dental implants improve retention, stability and function of prostheses in patients with large defects after traumatic injuries.\(^5\) Tissue defects might affect the desired position of implants. A removable implant-retained prosthesis for a maxillary defect is preferable when discrepancies exist between the implant location and desired tooth position of the definitive restoration. In addition, loss of prosthodontic support might result in the use of a removable prosthesis to achieve lip and cheek support and acceptable esthetics.\(^7-10\) The patient's ability to maintain oral hygiene is one of the main advantages of this treatment modality.

**Conclusion**

This clinical report presents a prosthetic rehabilitation of a patient following the traumatic loss of several maxillary teeth and supporting tissues. A large alveolar defect was managed using removable implant-supported prostheses which provide function, acceptable esthetic and patient satisfaction.

**Authors Affiliations**

1. Venus LoranEsfahani DDS, MD, Member of Kerman Oral and Dental Diseases Research Center, Assistant Professor, Department of Prosthodontics, Faculty of Dentistry, Kerman University of Medical Science, Kerman, Iran, 2. Abbas Monzavi DDS, MD, Associate Professor, Department of Prosthodontics, Faculty of Dentistry, Tehran University of Medical Science, Tehran, Iran.

**References**


**How to cite this article**


**Address for Correspondence**

Dr. Venus LoranEsfahani DDS, MD, Assistant Professor, Department of Prosthodontics, Faculty of Dentistry, Kerman University of Medical Science, Kerman, Iran. Email: v_loran@yahoo.com

**Source of Support:** Nil

**Conflict of Interest:** None Declared