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Customized gunning splint for para sagittal palatal split with right alveolar fracture- A case report

Gurminder Singh[1], Vibhu Ranjan Sahni[2], Damanpreet Kaur[3], Jasneet Kaur Dhaliwal[4], Ramandeep Singh Gambhir[5]

[1]Professor, [2]Senior Lecturer, [3,4]PG Student, [5]Reader, Dept. of Public Health Dentistry, Gian Sagar Dental College & Hospital, Rajpura, Punjab

***Corresponding Author:**
Email: raman2g@yahoo.com

Abstract

Road accidents, industrial accidents and engaging in sporting activities are responsible for most fractures of the midface. A careful history, oral and facial examination and radiographs are imperative whenever any fracture is suspected. Treating edentulous or partially dentate patients of maxillary /mandibular fracture with gunning splints is the standardized procedure followed. For the elderly patients it becomes difficult to do open reduction surgery due to various complications and compromised medical conditions. The complication rate of infection or mal-union is higher as compared to fractures in younger dentulous patients. The present article discusses a case where a patient who had met a road accident was treated with gunning splint which was customized suiting the prevailing condition as only few teeth were present at the time of trauma.

Keywords: Alveolar fracture, Splint, maxilla, Immobilization

Introduction

Treating partially dentate or edentulous patients for fixation of fractured maxilla / mandible poses a challenge for the operator in case of elderly patients.[1,2] Immediate concern should be to monitor the vital signs and clear the airway for any obstruction, any presence of foreign bodies, luxated, missing or fractured teeth, malocclusion or pain.[3] Often the immediate reduction of the fractured site is not helpful due to the compromised medical condition of the patient due to old age.[2] The chances of mal-union are higher compared to fractures in younger dentulous patients. The appropriate positioning of the maxilla requires clinical evaluation of the zygomatic regions, paranasal area and nasolabial angle. Final determination of the appropriate position of the maxilla and mandible follows the overall examination of the facial profile by the surgeon.[4]

Case Report

A 60 year old patient reported to the dental college with a complaint of swelling of the midface resulting from a road accident. The patient was examined by a team of oral and maxillofacial surgeons in the Department of Oral and Maxillofacial Surgery. The examination revealed swelling present on the right side of the face extending from infraorbital margin to the corner of the mouth. Laceration was present on the lower lip. Apart from this, there was no periorbital or sub-conjunctival ecchymosis. Intraoral examination revealed limited mouth opening and avulsed upper central and lateral incisors. In the maxillary arch 18,17,26,27 were the only teeth present. The only teeth present in the mandibular arch were 37,36 44,45,47 and 48. There was a split in the mucosa which was extending from 14 region to the soft palate along with a laceration on the right buccal mucosa (Fig. 1). Hematoma was present on the floor of the mouth. The patient was later diagnosed as having parasagittal fracture of the palate of the right side and right Le-fort 1 fracture. The patient was moderately built and conscious. After initial first aid and cleaning of the wounds the patient was referred to the Department of Prosthodontics for the fabrication of splint for the purpose of stabilizing the fractured segment.

As the fractured segment was hanging loose and the mouth opening was limited, it was decided to block the loose palatal segment with a gauze in order to make the initial impressions with alginate (irreversible hydrocolloid) impression material (Dentsply Zelgan Plus) (Fig. 2). This was done to prevent the flow of alginate into the fractured site. Subsequently, a mandibular impression was also made with alginate. A cast was obtained and a heat cure splint was fabricated. The molars on both the sides were engaged with clasps for retention (Fig. 3). A mandibular splint was designed with stoppers which would occlude with the maxillary splint and help keep that splint in place. Two vertical stops were made at 35 and 46 area (Fig. 4). The height of the stops were eventually adjusted in the patients' mouth at the time of insertion and joined with the opposite splint with self cure acrylic. The stops pushed the maxillary splint in its designated place holding the fractured palatal segment thus promoting secondary healing (Fig. 5). The face of the patient was tightly wrapped with a bandage to discourage patient from opening mouth. Sufficient opening was present at the anterior segment for facilitating feeding of the patient. The patient was evaluated after one month and the team

of oral and maxillofacial surgeons performed closed reduction of the fractured site.

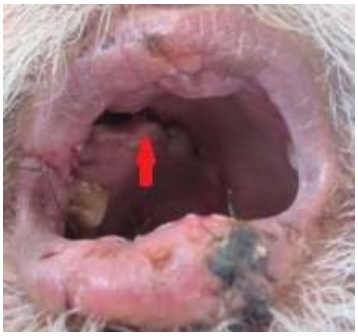

Fig. 1: Split in the mucosa extending from 14 region to the soft palate

Fig. 2: Impression of the fractured segment blocked with a gauze to prevent the flow of hydrocolloid into the defect

Fig. 3: Maxillary splint engaging the molars on the either side of the arch

Fig. 4: Vertical stops made on the mandibular splint

Fig. 5: Both the splints in position. The mandibular stops are holding the maxillary splint in position

Discussion

Thomas Brain Gunning presented the gunning splint for the immobilization of the edentulous or partially edentulous jaw segments after reduction.[1] Immobilization is carried out by attaching the upper splint to maxilla by para-alveolar wiring and lower splint to the mandibular body by circumferential wires. Inter-maxillary splinting can be done by connecting two splints with wire loops or elastic bands.

The palatal fractures are classified into six types namely: I, anterior and posterolateral alveolar; II, sagittal; III parasagittal; IV, para-alveolar; V, complex and VI transverse.[6] This case was classified into type III. Road and industrial accidents along with sport activities are the major causes of fractures of the face. A careful history, oral and facial examination and complete radiographic survey are imperative whenever any fracture is suspected.[4] The treatment options should be evaluated according to the patient's need and appropriate case selection with the dental team by careful treatment planning and interdisciplinary cooperation.[5] Gunning splints can be applied intraorally in varying situations. These intraoral splints require anchorage to the remaining teeth and /or to the inferior border of the mandible.[3]

In the above mentioned case it was required to stabilize the mobile palatal segment initially to achieve secondary healing before the final reduction could be done. The gunning splint made in the mandibular segment had two vertical stops which kept the upper splint in its place thus immobilizing the fractured palatal bone. The patients existing teeth can be used to give an approximate vertical dimension.[7] A wrap around the chin and the head kept the patients mouth closed with an opening in the anterior region for feeding purpose.

Conclusion

As the elderly population continues to increase, maxillofacial surgeons are faced with management of more difficult injuries in this group of patients.[8] In almost all cases of the fracture of the maxilla / mandible a satisfactory union of the fractured segments can be obtained with Gunning splint. These splints can be customized according to the prevailing condition of the

patients mentioned in the above case. Instead of doing para-alveolar wiring in the maxilla and circumferential wiring in the mandible, the existing teeth were used for anchorage as is done in the cases of removable partial dentures. After approximating the jaws a tight bandage was wrapped around the patients head and chin immobilizing the jaws.

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