TWIN OCCLUSION: A GUIDE FOR GLIDE IN MANAGING AN ATROPHIC FRACTURED MANDIBLE

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Abstract
Despite being a less common encounter for maxillofacial surgeons, the atrophic edentulous mandible fracture has more challenging traits. Given the unbalanced harmony of mandibular movements in these situations, creating functioning complete dentures is a highly ardous and laborious task.The present article describes the fabrication of a dual occlusion prosthesis to guide the mandible into its most functionally favourable position in a postoperative case with a long-term scarring and mandibular deviation to the affected side.

Key words: Atrophic edentulous mandible, mandibular fractures, twin occlusion

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INTRODUCTION

The atrophic edentulous mandible fracture though rarely encountered by maxillofacial surgeons, presents a more difficult set of characteristics given that it has more sclerotic bone and less bone volume for bony contact, both of which might hinder healing. This makes the management onerous requiring a customized treatment plan [1,2]
Fabrication of functional complete dentures for these cases is a very arduous and demanding endeavor as there is an imbalance in the harmony of mandibular movements[3]
This article highlights the functional rehabilitation of the atrophic edentulous fractured mandible using twin occlusion.

CASE REPORT

A 55-year-old male patient reported with a chief complaint of pain and swelling over his chin and inability to close the mouth after alleged history of road traffic accident. The patient was conscious but disoriented and presented with bleeding from mouth and nose. On extraoral examination: a diffused swelling over the left face extending supero-inferiorly from left infra orbital margins to lower border of the mandible and mediolaterally from left lateral border of nose to 4cm anterior to tragus and an ovoid swelling over the chin region measuring approximately 3-4cm diameter extending from the left commissure of the lip towards the lower border of mandible supero-inferiorly was noted(Fig 1).

Skin over the swelling appeared normal. Bilateral circumorbital ecchymosis was present. Subconjunctival hemorrhage was seen in the left eye. Deviation of the nasal septum and chin towards right were noted. Palpatory findings confirmed a Step deformity over the left infraorbital rim and presence of tenderness over the nose, bilateral zygomatic arch and lower 1/3rd of face and chin.

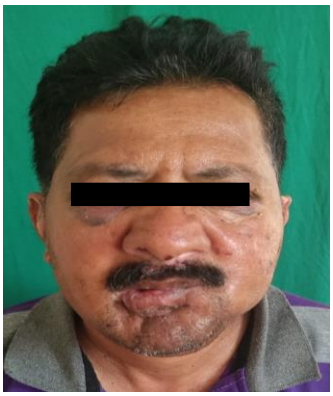

Fig 1- Extraoral diffuse swelling over the mandible with circumorbital ecchymosis

Intraorally he was completely edentulous, Coleman's and Guerin sign were present with lacerations in mandibular anterior region vestibular tenderness in right angle and left Para symphyseal region. There was Segmental mobility between 41 and 31, 35 and 36 with anterior open bite and deviation of tongue to the right side noted.
Orthopantomogram revealed inferior displacement and downward rotation of the fractured mandible.(Fig 2) Computed Tomography revealed Multisite fractures involving Right mandibular angle, Right parasymphysis, left body of mandible, Nasal bone and a Deviated nasal septum towards right. (Fig 3)

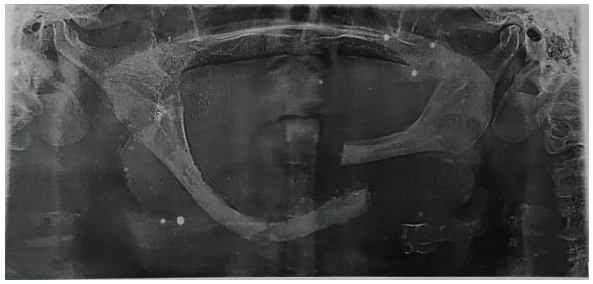

Fig 2- Pre operative orthopantomogram showing multisite fractures

Fig 3 -Pre operative 3D ct scan showing multisite fractures

Open reduction and internal fixation of maxilla and mandible was done with miniplates and screws. (Fig 4) Postoperatively habitual jaw deviation noted which was corrected prosthetically.

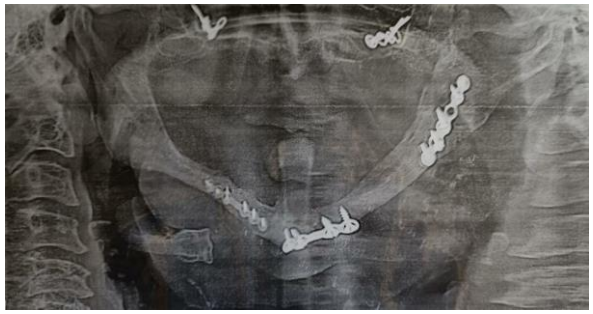

Fig 4 Post operative OPG showing open reduction and internal fixation of fractures with miniplates and screws

CLINICAL PROCEDURE FOR PROSTHETIC REHABILITATION:

Preliminary impressions were made with impression compound for maxilla and alginate for mandible (Fig 5a).

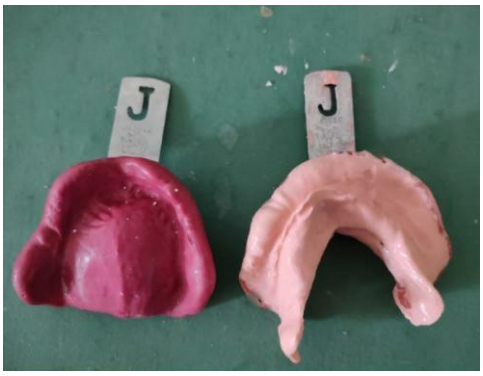

Fig 5a Primary impression of maxilla with impression compound and mandible with alginate

Custom trays were fabricated. Border moulding and secondary impressions were taken using green stick compound and zinc oxide eugenol impression paste respectively. (Fig 5b).

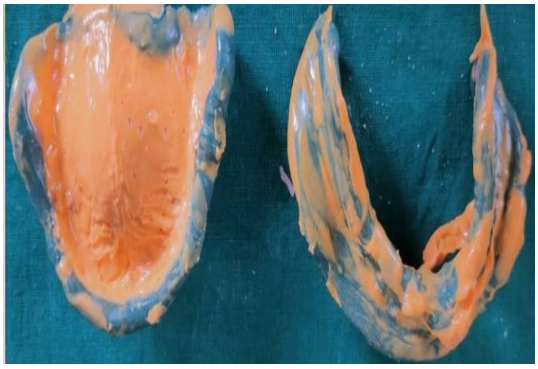

Fig 5b Secondary impression and border moulding

Master casts were obtained. Fabrication of denture base and occlusal rim was done. Articulation of the casts was done using a facebow transfer and maxillomandibular relations were recorded(Fig 6).

Fig 6 Facebow transfer with maxillomandibular relations

The type of teeth used were Acry rock (Ruthinium)on the ridge and palatally crossed linked acrylic (Premadent) which were grinded selectively to have lateral freedom of movement. A try in was done to verify the teeth arrangement and a final denture prosthesis with twin occlusion was fabricated (Fig 7). Patient was followed up for past 6months and showed considerable improvement. (Fig 8)

Fig 7 Twin occlusion prosthesis

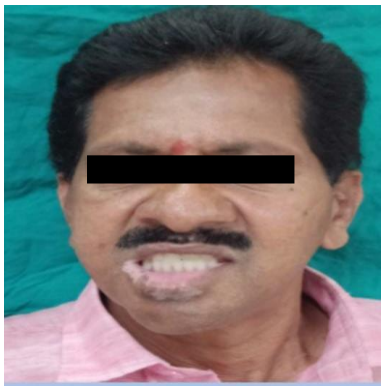

Fig 8 Follow up photograph post months

DISCUSSION

Fabrication of functional complete denture for edentulous patients with multiple fixations and plating is a complicated feat to manage. In present case, tissue in surgical region was scarred, uneven and movable in various degrees leading to mandibular deviation due to contracture of tissues. So, establishing proper occlusion and guiding the mandible into centric position although patient is previous denture wearer is complicated.[5]

In cases with CANTOR AND CURTIS CLASSIFICATION of class II,III,IV and V guide flange prosthesis would be treatment of choice but it is not possible in this case as patient is completely edentulous.[6]

These features makes the area unsuitable to be covered by an appliance and or receive loading. The frontal plane rotation occurs due to loss of proprioceptive sense of occlusion, which leads to uncoordinated and less precise movement of mandible.[7]

The basic objective of rehabilitation is training the mandibular muscles to stabilize the mandibular denture by providing an acceptable maxillary–mandibular relationship. To achieve this feat many prosthetic options are present like guiding flange, palatal ramp, twin occlusion. If we give a guide flange prosthesis in a completely edentulous case the untoward forces that act on the removable prosthesis due to deviation of the mandible can cause destabilisation. Therefore, in such cases a stabilising ramp or a second set of teeth is given on the palatal side. This prosthesis is called a complete denture with twin occlusion.

By giving monoplane premadent teeth on the palatal side on the contralateral side we aimed to provide a stable occlusal stop for the patient so that the prosthetic stabilisation will be achieved. On the peripheral side a set of Acryrock teeth were given which were selectively grinded according to the patient's masticatory forces and occlusal contacts. Acryrock teeth doesn't wear as easily thus, giving an advantage of patient's prosthesis gliding into a more acceptable position. This converts the prosthesis from a stabilising appliance to a semifunctional appliance giving the patient some kind of masticatory advantage as well.[8]

After insertion of prosthesis the patient could intercuspate mandibular teeth properly due to twin maxillary occlusal table on contra lateral side.

CONCLUSION

Along with early guiding therapy, customised physiotherapy, and patient involvement, a multidisciplinary team approach is necessary for a superior prosthodontic treatment outcome. The construction of a twin occlusion prosthesis is described in this paper in order to direct the mandible into its most functionally advantageous position following long-term scarring and mandibular deviation to the affected side. The patient's optimistic mental outlook on receiving treatment with supported physical therapy helped him overcome the restrictions of prosthetic rehabilitation, producing satisfactory results.

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