

# The use of mini plates for intermaxillary fixation in a severely comminuted mandibular fracture with bilateral condylar fractures

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## ABSTRACT

Intermaxillary fixation (IMF) is an integral technique utilized by maxillofacial surgeons to appropriately reduce and relate maxillary and mandibular fractures to both one another and the facial skeleton. This case report reviews the management of a comminuted mandibular fracture including inoperable bilateral condylar fractures that precluded the use of convention IMF techniques necessitating an alternative technique. This was achieved in the form of modified bony plates extending intraorally. Postoperative review showed favorable results with occlusion and range of motion comparable to the premorbid function and no unforeseen complications.

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## INTRODUCTION

Intermaxillary fixation (IMF) is a technique utilized in maxillofacial surgery to relate the maxilla and mandible in three dimensions of space. Various techniques and methods have been described and utilized in the literature, which include arch bars, IMF screws, hybrid IMF, orthodontic brackets/buttons, islet wires, embrasure wires, and gunning splints.<sup>[1-4]</sup> Its applications typically include trauma, orthognathic surgery, and maxillofacial reconstruction, and it serves as an invaluable technique in correctly positioning the maxilla and mandible relative to each other and the facial skeleton. There are factors involved in all of the above-mentioned techniques which can limit its usage, such as in settings where there are insufficient dentition and comminuted dentoalveolar segments, precluding the use of teeth or alveolar bone

as anchorage points for IMF. This paper reports on a case where traditional methods of IMF were unable to be applied due to the nature of the injury, and a novel method was utilized to ensure effective postoperative IMF.

## CASE REPORT

A 33-year-old male was airlifted to Fiona Stanley Hospital, Western Australia, with mandibular trauma after being struck in the face with a boating winch. He sustained bilateral condylar neck fractures, comminuted body, and symphyseal fractures with multiple dentoalveolar segment fractures [Figure 1]. The height of the bilateral condylar fractures contraindicated open reduction and

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internal fixation. The partially dentate mandible with comminuted dentoalveolar fractures precluded the placement of arch bars. Furthermore, the nature of the fractured segments did not allow for the placement of IMF screws as no solid segment was available superior to the depth of the mandibular vestibule.

The mandible was reconstructed through an external approach and placement of a 2.0 reconstruction plate (DePuy Synthes™, MatrixMANDIBLE Recon) along the inferior border with bicortical locking screws to establish anatomical reduction. Further bicortical screws were used to reduce and secure the sagittal fractures through the mandible and reestablish alveolar width. Unsalvageable teeth were removed, and the fractured mandibular incisor dentoalveolar segment was splinted with 25-gauge circumdental wire.

To achieve IMF to treat the bilateral condylar fractures (which were unable to be treated with open reduction internal fixation due to the size of the segments), two “L-” shaped bone plates (DePuy Synthes™, Compact 2.0 Combi) were placed on the stabilized mandibular symphyseal segment with the vertical arm emerging through a transmucosal stab incision made in the sulcus [Figures 2 and 3]. The most superior hole of each plate was transected to allow for easy application of elastics. In the maxilla, four 8 mm IMF screws (DePuy Synthes™, IMF Screw Set) were placed between the right and left first premolars. Anterior elastic IMF was sufficient to guide the mandible into centric occlusion and prevent the development of a Class 2 anterior open bite. The patient was placed in IMF utilizing heavy elastics for the first 2 weeks postoperatively and was then switched to guiding elastics for a further 4 weeks, which were removed by the patient during the day to facilitate mouth-opening exercises. He was prescribed chlorhexidine 0.2% mouthwash to use three times a day and simple analgesics. At 8-week postsurgery, the patient maintained a Class I occlusion and reestablishment of his preexisting overbite and overjet. His maximal interincisal opening was 40 mm. The bone plates were removed at 8-weeks postsurgery, and there were no complications associated with healing or fixation infection.

## DISCUSSION

IMF remains an integral technique in maxillofacial surgery in both the intraoperative setting as well as postoperatively. While there is a wide range of commonly utilized techniques to aid in establishing fixation, each has their own contraindications and limitations. This case report describes an alternative option to achieving adequate IMF. The use of bone plates extending through the mucosa appears to be both an effective and safe

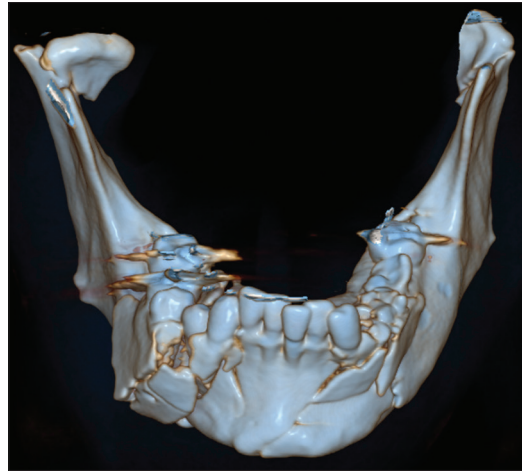


Figure 1: Preoperative mandible



Figure 2: Left bony plate



Figure 3: Postoperative computed tomography

option without the need for additional equipment and should be considered in cases where traditional forms of IMF are unable to be performed.

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### Conflicts of interest

There are no conflicts of interest.

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