■ *Case Report*

# Efficacy of intermaxillary fixation screws

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**Abstract**

Intermaxillary fixation (IMF) is a technique which is basically used for management of fracture.This includes IMF screws and various dental wirings. However IMF may not be advantageous in case of edentulous or partially dentulous patients. The purpose of this article is to report a case of unilateral parasymphyseal and zygomatic arch fracture managed successfully by IMF screws and to list the difficulties faced during the surgery.

**Keywords:** intermaxillary fixation, intermaxillary screws, zygomatic and parasymphyseal fracture

## Introduction

IMF Screws forms to be the fundamental treatment of treating the patients with maxillofacial injuries. For a treatment to be successful especially for mandibular fractures it totally depends upon reduction, temporary IMF with correct registration of occlusion. The origin of immobilization started in Greece[1] where fractured mandible used to be bandaged. Since then various modifications have been brought. IMF with bone screws was used first in 1981.[2]

## Case report

A 20 year old male patient reported to the Department of oral and maxillofacial surgery, I.T.S Dental College and Hospital with the Chief complaint of pain in right side of lower jaw tooth back region since day 1. History of present illness reveals that the patient had trauma 18 hours ago for which he reported to the general practitioner who gave him dressing and medication. Clinical examination reveals swelling present on the right side of face extending from Mid-Parasymphyseal region to posterior border of Ramus and outer Canthus line to lower floor of mandible since then. Step deformity is clinically present. TMJ movements were deranged. Tenderness was present on right side of parasymphyseal region and on right side of zygomatic region. Orthopantamogram (OPG) showed fracture line in between right central and lateral incisor running to lower border of mandible. Also fracture line is present on right side of zygomatic arch.

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## Armamentarium

Instruments which were used in this procedure were surgical drill, IMF screws (11 mm, 2 mm length stainless steel), stainless steel wire, power driven micromotor drill, No. 206 bur, self holding screw driver.

## Procedure

Primary stabilization was first attempted on day 1 which was successful as the patient had favourable fracture. In the next appointment patient was given local anaesthesia in order to perform IMF.

Incision was given lateral to canine root and the mucosa was reflected with the help of periosteal elevator. With the help of micro motor, a drill was made in the alveolar bone. The holes were made lateral to canine root, 5mm superior in case of maxilla and 5mm inferior in case of mandible. In total four screws were placed in each quadrant respectively. The determination of hole was done preoperatively by clinical assessment and OPG. Screws were placed with keeping utmost care while not to damage the mental foramina and away from root prominence of canine. The drills were placed 90 degrees from the roots of adjacent teeth. The screws were placed after the drill was made with the help of

self threading screw. Before tightening the wires, the correct occlusion has to be established.

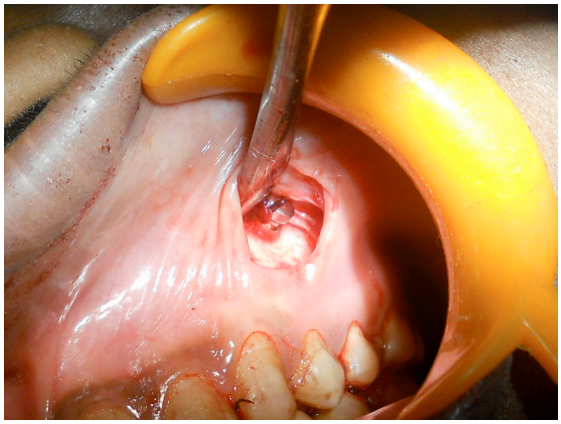
After the four screws were placed, 26 gauge stainless steel wire was taken and threaded through the head of screws in both upper and lower jaw in order to attain IMF.

Patient was recalled after 3 days for re-evaluation. Investigation of post operative OPG was done to ensure the proper placement of screws and to evaluate the condition after the procedure.

Regular follow up weekly was performed until the fracture healed completely.

**Figure 1**: OPG showing fracture line in between right central and lateral incisor running to lower border of mandible and is also present on right side of zygomatic arch.

**Figure 2:** IMF screws placed 5mm superior and lateral to canine root, 90 degrees from the roots of adjacent teeth



## Discussion

Intermaxillary fixation is an important step to be performed for treatment of mandibular fractures. This helps to restore the normal form and function of the individual. Various treatment modalities have been

**Figure 3:** OPG showing four IMF screws through which stainless steel wire was threaded.

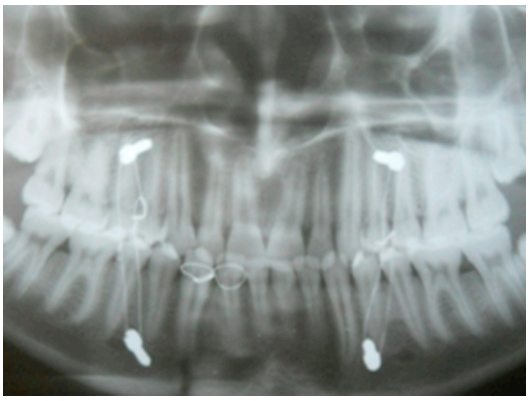
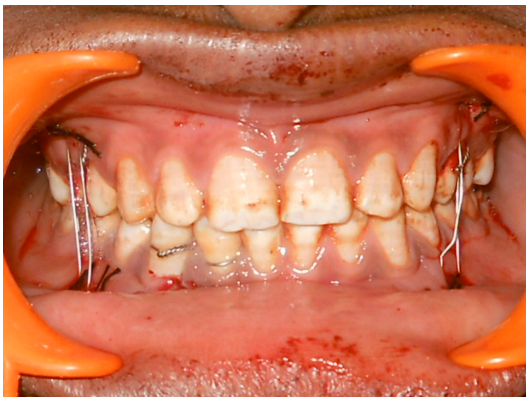


**Figure 4:** 26 gauge stainless steel wire is placed through IMF screws to achieve primary stabilization



listed for mandibular fractures which include arch bars, eyelet wiring and skeletal suspension wires. Earlier arch bar was used for mandibular fractures but due to various disadvantage its use have been reduced. The disadvantages are:-Time duration is longer for placement and removable, risk of penetration injury to surgeons,[3] this procedure is technique sensitive in case of grossly carious, periodontally compromised and where there is extensive bridge and crown work, difficulty in maintaining oral hygiene, also there is risk ischemic necrosis of mucosa and loss of vitality of tooth structure if the wires are not tightened properly around the teeth.[4]

There are two techniques described in the literature:

1. *Arthur & Berardo*[5] described about the monocortical self tapping screw where holes were pre drilled for the insertion of screws.
2. *Domenick & Andrew*[6] described about the self drilling IMF screws.

We have used the technique as described by *Arthur*

*& Berardo (1989)* which utilizes at least four self-tapping titanium screws inserted transmucosally, one for each quadrant. The screws 11mm long and 2mm in diameter are inserted at the junction of the attached and mobile mucosa between the canines and first premolars. Though there are disadvantages of this procedure the advantages are comparatively more favourable as compared to arch bar. These are:

Insertion is easy and takes approximately 10 min, with significant intraoperative savings in both time and cost, the screws are easy to remove, even without anesthesia, the risk of prick accidents is greatly reduced, therefore decreases the risk of transmission of blood borne diseases, the risks of damage to the dental papillae and oral mucosa are considerably reduced, the teeth and dental prostheses are not subject to traction , dental hygiene is easily maintained with IMF screws ,the method is compatible with rigid fixation using any plating system.[5]

However there were certain difficulties faced while operating. These are

1. There was slippage of the screw holding device from the screw because of restricted mouth opening.
2. Patient reported pain when screws were placed in the maxillary arch for which additional LA was given.

Other complications are:

Over tightening the wires can lead to a lateral rotation of the fragment, there is a great risk of damaging roots of the teeth while placing the screws especially in patients of dental crowding, screw breakage, loss of screws or even iatrogenic damage to the inferior alveolar or mental nerve .[3,6] Therefore it is utmost necessary to take precautions in order to avoid such complication and this method is mainly used in case of unilateral and bilateral mandibular fractures with minimal displacement, compound condylar fractures, and fractures in edentulous patients if the proper dentures are available.

## Conclusion

Therefore, IMF on long time basis has been proved to be better than that of arch bar. The surgeon must evaluate the efficacy of IMF, its advantage, disadvantage and complication before treating a case.

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