A New Simplified Technique for Intermaxillary Fixation by Loop-Designed Wire

Ajay Verma · Sunil Yadav · Vikas Dhupar

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Abstract In the treatment of maxillofacial fractures, Inter-maxillary fixation (IMF) is an important. The upper and lower arch bars or Ivy eyelet wiring is secured by wires and IMF is done with the help of box wiring. Here, we present a new type of IMF technique, using 26-gauge stainless steel ‘loop-design’ wire, which is a simple, quick, economical and minimally invasive technique without using arch bars. Typical indications for its use are minimally displaced fractures, deep bite cases, stabilization of fracture during open reduction and internal fixation, orthognathic surgeries and in tumor resection surgeries.

Keywords Maxillofacial fractures · Inter-maxillary fixation · Loop-designed wire

Inter-maxillary fixation (IMF) is an important contrivance in the treatment of maxillofacial fractures, and is usually applied by wiring together the fixed upper and lower arch bars or Ivy eyelet [1, 2]. Different IMF methods, including prefabricated arch bars, direct interdental wiring, continuous or multiple loop wiring, and IMF screws, have been reported [1, 2]. However, these techniques are time consuming, complicated, costly, need laboratory support,

extend surgery time [3]. Here we present a new IMF technique using single loop-designed wires, providing bucco-lingual stabilization.

Technique

In this technique, single 26 gauge stainless steel wire of 6 inches is taken, which is shaped as Ivy loop. The loop wire is passed around the neck of the upper first molar tooth, both ends of loop wire going from buccal to palatal, one along the mesial surface and other end along the distal surface of tooth (Fig. 1). Then both ends of wire are passed back around the lower first molar from lingual to buccal aspect in a similar approach (Fig. 2). Same procedure is repeated on the premolar teeth and on the contralateral side (molar and premolar regions). After achieving the occlusion, the ends of wire are twisted together on the buccal surface of the lower premolar and molar teeth on both sides (Fig. 3) and the loop is placed in the interdental cervico-gingival level for IMF. At the end of treatment, holding and pulling the loop wire can easily remove IMF with minimum trauma to the adjacent soft tissue. It can be used for both intra-operatively to keep the mandible in the desired position especially in deep bite cases where the arch bar placement is not possible, (Fig. 4) while bone plating for fracture mandible and to immobilize the jaws for conservative management.

Discussion

A good IMF technique should be easy and quick, low cost, secure desired occlusion, avoidance of unwanted forces on anterior teeth, minimally invasive, safe for the patient,

A. Verma (✉)
Department Oral and Maxillofacial Surgery, PDM Dental
College, Bahadurgarh 124507, Haryana, India
e-mail: drajayverma05@yahoo.co.in

S. Yadav
Department of Dentistry, BPS Government Medical College for
Women, Khanpur Kalan, Sonapat, India

V. Dhupar
Department Oral and Maxillofacial Surgery, Goa Dental
College, Bambolim, Goa, India

Fig. 1 Step 1 of technique

Fig. 3 Final step of technique and achievement of occlusion

Fig. 2 Step 2 of technique

Fig. 4 Loop design IMF technique in a patient of mandible fracture with deep bite

possess an emergency quick release system. Some authors have used single wires for IMF with bucco-lingual stabilization [1, 2]. The disadvantage of this technique is that removal of the wires after completion of procedure is very difficult, as we cannot hold the wires for retrieval. So, we have modified the technique by using loop wire. Loop of the wire can be held for easy and swift removal of wires.

In our clinical experience of about 1 year, we feel the present ‘loop-design’ encompasses most of these ideal requirements. It is an easy, simplified, economical and minimally invasive technique. It firmly maintains the desired occlusion. It lends support to the fractured fragment from both buccal and lingual surfaces. No specialized instrument or laboratory work is required. The greatest advantage is time saving; it just requires less than 10 min for IMF and can be quickly released in case of emergency.

Typical indications for its use are conservative management of minimally displaced fractures, maxillofacial fractures in deep bite cases, stabilization of fracture during open reduction and internal fixation, orthognathic surgeries and in tumor resection surgeries.

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