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Intermaxillary fixation screws versus Erich arch bars in mandibular fractures: A review

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ABSTRACT:
Intermaxillary fixation is standard treament modality for the management of mandibular fractures. Erich's arch bar provides an effective and versatile means, but it alss has its set of shortcomings. These have been overcome by the introduction of IMF screws. The aim of this article is to review the literature available comparing arch bars and imf screws.

KEYWORDS:
Mandibular fractures, arch bars, imf screws, intermaxillary fixation.

INTRODUCTION:

The treatment of any maxillofacial fractures involves either closed or open reduction fixation and thereby restoring normal occlusion and function. The principles of treatment for mandibular fractures have changed recently[1]. Even though the rigid internal fixation has become the standard method in reduction and fixation of simple and complex facial fractures, intraoperative temporary intermaxillary fixation (IMF) or postoperative wire or elastic placement has traditionally been achieved with the use of Erich arch bars, interdental eyelet wiring, external pin fixation, bonded brackets, embrasure wires, cast metal splints, and pearl steel wires[2]. Arch bars provide an effective and versatile means of intermaxillary fixation,but it has ots set of disadvantages[1] . Risk of penetrating injury to surgeon, increased surgical time both in removal and placement, trauma to periodontium, and compromised oral hygiene are allshortcomingsoftraditionalarchbars.

In 1989, self-drilling IMF screws were introduced, which have eliminated many of the above mentioned issues of arch bars[3]. IMF screws are quick and easy to use and shorten the operating time to achieve intermaxillary fixation. They are relatively inexpensive and reduce the risk of needle stick type injuries associated with wires. They do not cause trauma to the gingival margins and gingival health is easier to maintain as compared with arch bars.

The aim of this article is to review literature available on the usage of imf

screws and arch bars for the management of mandibular fractures .

MATERIALS AND METHODS :

Using the above mentioned keywords , a detailed search was carried out through electronic databases such as pubmed , google scholar and textbooks of oral and macillofacial surgery . Articles related to the topic were obtained . These were then reviewed .

DISCUSSION :

According to statistics , maxillofacial trauma comprises 42 % of all injuries , out of which 70% are mandibular fractures and 30% are maxillary fractures [4]. From ancient times , Intermaxillary fixation (IMF) has been considered to be the most important treatment step in the management of maxillo mandibular fractures . It is essential to obtain the correct inter arch relationship , which will thereby aid in proper reduction and fixation of fracture fragments .

Various other methods to achieve IMF have been described in literature[5,1] such as Ivy eyelet wiring, Risdon wiring, arch bars, metal splints, acrylic splints, gunning type splints for edentulous patients, bonded brackets, and more recently self-tapping and self-drilling IMF screws.

Erich arch bars have been considered as the standard for achieving IMF because of its rigidity and versatility. Although they provide superior occlusion control and reliable fixation, they have many disadvantages including difficulty in maintaining oral hygiene, trauma to the periodontium, reduced patient compliance and discomfort, longer time required for placement, and risk of needle stick injury. Tooth avulsion during the twisting and tightening of the wire around the tooth has also been reported in literature. According to Wilson and Hohmann, 1976[2], wires tightened during the application of arch bars around the teeth may cause ischemic necrosis of the mucosa and the periodontal membrane and if damage is extensive, tooth loss may result.

To overcome these problems, alternate techniques such as self-tapping IMF screws have been introduced. These screws provide a bone-borne support for the IMF wires to achieve IMF instead of a tooth-borne support in the case of arch bars. Due to this, many complications related to tooth-borne devices such as poor oral hygiene and periodontal health can be avoided.

Rai *et al*.[6], in a comparative study reported more plaque accumulation in patients treated using Erich arch bars as compared to IMF screws. They found a significant difference between the plaque index values of both the groups, and on the basis of this, they concluded that maintenance of oral hygiene is better in patients treated usingIMFscrews.

In a study conducted by Lingraj Balihallimathet al.[7], the time taken for the placement of arch bars and IMF screws was assesed . The data showed that maximum time (approximately 45 min) was required for the placement of Erich arch bars. According to this study , the average time for the placement of IMF screws was found to be 18.7 min, which suggested reduced intraoperative time and shorter duration of general anesthesia.

Farr and Whear[8] reported a case of fracture of screw at the junction of screw head and threaded portion. Another complication mentioned with the use of IMF screws was iatrogenic injury to the roots of the teeth adjacent to the site of screw insertion.

Coletti *et al*.[9] advised the use of self-drilling screws as they have higher tactile feedback during placement. It can prevent root damage as it allows the surgeon to modify the insertion position of the screw in case of high resistance. Despite this, the author encountered root fracture during screw placement in 2 (4%) out of 49 patients. Both the teeth were eventually extracted. The site for screw placement should be determined after proper radiographic assessment with the use of Orthopantomographs and intraoral periapical radiographs. The three-

dimensional relationship of the path of insertion of the screw with the surrounding dental structures should be carefully assessed to reduce the iatrogenic dental trauma.

CONCLUSION:

Through this review , it can thus be concluded that IMF screws provides good intra operative intermaxillary fixation . It consumes less time for its placement . Oral hygiene was found to be better in patients with imf screws rather than patients in whom arch bar was used . The risk of penetration injury caused by the use of stainless steel wires is also reduced in the case of IMF screws . The main complication encountered with the use of IMF screws was the increased chance of screw loosening.

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REFERENCES:

1. Fonseca RJ. Oral and Maxillofacial Trauma Pennsylvannia. 2nd ed. Vol. 1. New York: WB Saunders Company; 1991. p. 359-414.
2. Ring ME, Harry N, editor. Dentistry – A Illustrated History 1992. New York: Abrahams Inc. Publishers; 1992. p. 70.
3. Peter Banks. Killey's Fracture of Mandible. 4th ed. Bombay: Varhese Publishing House; 1993. p. 46.
4. Jones DC. The intermaxillary screw: A dedicated bicortical bone screw for temporary intermaxillary fixation. Br J Oral Maxillofac Surg 1999;37:115-6.
5. Arthur G, Berardo N. A simplified technique of maxillomandibular fixation. J Oral Maxillofac Surg 1989;47:1234.
6. Rai A, Datarkar A, Borle RM. Are maxillomandibular fixation screws a better option than erich arch bars in achieving maxillomandibular fixation? A randomized clinical study. J Oral Maxillofac Surg 2011;69:3015-8.
7. Lingraj Balihallimath**,** Rahul Jain**,** Ujjval Mehrotra**,** Ninad Rangnekar . To compare the efficiency of maxillomandibular fixation screws over erich arch bar in achieving intermaxillary fixation in maxillofacial trauma: A clinical study . Journal of ICDRO 2018 ;27-31.
8. Farr DR, Whear NM. Intermaxillary fixation screws and tooth damage. Br J Oral Maxillofac Surg 2002;40:84-5.
9. Coletti DP, Salama A, Caccamese JF Jr. Application of intermaxillary fixation screws in maxillofacial trauma. J Oral Maxillofac Surg 2007;65:1746-50.