



IS THE PRACTICE OF POSTOPERATIVE INTERMAXILLARY FIXATION IN MANDIBULAR TRAUMA SUPPORTED BY EVIDENCE IN MORADABAD?

Maxillofacial Surgery

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ABSTRACT

Context: The purpose of this questionnaire study was to determine whether the usual application of intermaxillary fixation (IMF) following surgery for mandibular injuries (only to the dentate segments) was supported by the evidence of literature. **Settings and Design:** This study's design called for a questionnaire survey to be given to surgeons of Moradabad who treat mandibular fractures. **Materials and Methods:** Moradabad's oral and maxillofacial surgeons and were mailed a typed questionnaire for their comments. The university's ethical commission gave its approval. 20 oral and maxillofacial surgeons participated in this survey, which was comprised of all the feedback forms that were returned among 22 OMF surgeons. **Results:** Although open reduction and internal fixation (ORIF) is used by the majority of surgeons, 10% of OMF surgeons still favour utilising only IMF as the sole mode of treatment for the aforementioned group of mandibular fractures. Our survey indicates that even after employing ORIF, the majority of surgeons frequently use IMF in the postoperative situation. 75% of surgeons appear to consider occlusion to be the most important consideration when selecting whether to employ IMF as an adjuvant following ORIF. Depending on the fracture site, 62% of surgeons alter the length of IMF. **Conclusion:** Despite the lack of strong scientific evidence in favour of its usage, surgeons appear to favour the usual use of postoperative IMF in cases of mandibular fractures. Furthermore, there is no proof that the absence of IMF will negatively affect occlusion or anything else.

KEYWORDS

INTRODUCTION:

In the past, several forms of intermaxillary fixation (IMF) have been used to restore a functional dental occlusion during the treatment of facial fractures¹. Before the use of plate fixation, the reduction and stabilisation of mandibular fractures have been assisted by the use of interdental wire ligatures or arch bars for intraoperative Maxillo Mandibular Fixation (MMF)⁴. The issue with this method is that it takes a long time and poses a serious danger of skin puncture, which might potentially expose the surgeon to diseases. Some investigators have made an effort to reduce these dangers and boost operating room effectiveness by completely skipping wire/arch bar MMF in favour of manually reducing the fractures instead². The management of mandibular fractures has improved as a result of several crucial innovations over the 20th century. The first was the development of penicillin during World War II, which encouraged open reduction of fractured mandibles and thus increased the precision of fracture alignment. The second advancement was the development of miniature bone screws and plates in the 1960s and 1970s, which allowed for the firm internal fixing of fracture sites and eliminated the need for postoperative IMF⁶. The majority of surgeons still employ IMF to assist in the intraoperative reduction of the fracture sites prior to fixation with bone plates and screws, despite the widespread usage of rigid internal fixation¹⁵. Oral and maxillofacial surgeons have improved their methods for treating facial fractures with internal fixation during the past three decades⁷. This study was designed as a Single arm questionnaire survey that will be sent to Moradabad-based Oral surgeons who treat mandibular fractures.

AIM & OBJECTIVE:

This questionnaire study was carried out to determine whether the frequent use of IMF following surgery for mandibular injuries (of the dentate segments only) was supported by the evidence in the literature.

MATERIALS AND METHODS:

Total 21 Practising Oral and Maxillofacial surgeons in Moradabad were sent the questionnaire among which 20 of them gave their feedback to the questionnaire. The study was conducted in department

of Oral And Maxillofacial Surgery at Kothiwal Dental College, Moradabad. Inclusion criteria : Registered practitioners of Oral and maxillofacial surgery in Moradabad and those OMF surgeons who have got their postgraduate degrees were included in the study. Those who left the Moradabad city by 2020 or still under training were excluded from the study. The google forms and questionnaire used by Shenoy et al.2022 were used for the format of questionnaire. The survey included demographic information, patient treatment and the availability of necessary infrastructure influence of the pandemic on research, health care, and influence on finances and training. The google forms and questionnaire used by mafia et al.2020 were used for the format of questionnaire.

The survey included demographic information, patient treatment and the availability of necessary infrastructure influence of the pandemic on research, health care, and influence on finances and training. The following questionnaire was sent to the OMF (Oral and Maxillofacial) surgeons.

- Q1.) What is your preferred modality of treatment for mandibular fracture?
 - a) rigid osteosynthesis,
 - b) semi-rigid osteosynthesis,
 - c) transosseus wiring,
 - d) intermaxillary fixation only
- Q2.) Do you routinely use postoperative intermaxillary fixation (IMF) in all cases of mandibular fractures?
 - a) yes,
 - b) no
- Q3.) What criteria do you choose to select postoperative intermaxillary fixation as an adjunctive modality of treatment in mandibular fracture?
 - a) displacement of fracture,
 - b) medical condition of the patient,
 - c) age of the patient,
 - d) occlusion,
 - e) any other

- Q4.) How long do you advise intermaxillary fixation to be kept postoperatively?
- 1 week,
 - 2 weeks,
 - 3 weeks,
 - 4 weeks,
 - more than 4 weeks
- Q5.) What criteria do you employ to decide about the period of postoperative intermaxillary fixation?
- occlusion,
 - fracture fragment mobility,
 - others
- Q.6) Does your period of postoperative intermaxillary fixation vary according to site of fracture?
- yes,
 - no
- Q7.) Do you think that use of postoperative intermaxillary fixation on a routine basis gives more favorable occlusion?
- yes,
 - no
- Q.8) What modality do you use most often for intermaxillary fixation?
- wiring,
 - screws,
 - guiding elastics,
 - any other
- Q.9) While performing intermaxillary fixation using wires have you encountered glove perforation or prick injuries?
- yes,
 - no
- Q.10) Have you ever come across a case of allergy to metal caused by materials used for intermaxillary fixation?
- yes,
 - no
- Q.11) Do your patients experience weight loss after a period of postoperative intermaxillary fixation?
- yes,
 - no
- Q.12) Did patient felt a bit embarrassed ?
- Yes
 - No
- Q.13) Did the patient found it difficult to carry out the daily activities ?
- Yes
 - No

RESULTS:

A total of 22 oral and maxillofacial surgeons in Moradabad received the questionnaire survey. 20 oral and maxillofacial surgeons responded by sending an email. Despite the fact that ORIF is used by the majority of surgeons, 90% of surgeons routinely provide IMF in the postoperative period, and 10% of surgeons still favour IMF as the exclusive modality of treatment for the aforementioned category of mandibular fractures. 62% of surgeons appear to consider occlusion to be the most important consideration when selecting whether to utilise IMF as an adjuvant after ORIF. IMF is used by 15% for a week, but by over 23% for four weeks or more by OMF surgeons.

Although the majority of surgeons (90%) choose rigid or semi rigid fixation. Once again, occlusion appears to be the deciding factor in determining the duration of the IMF after ORIF. Based on the location of the fracture, every surgeon varies the IMF period. Approximately 75% of surgeons responded "yes" when asked if routine postoperative IMF resulted in more favourable occlusion. Wiring is the favoured method of IMF by 60% of OMF surgeons, and as expected, 82% of surgeons have sustained injuries during the surgery.

Only 10% of surgeons, or a very small percentage, encountered a metal allergy, but 88% of them reported that their patients lost weight after using IMF, even after using it for just one week. Despite evidence in the literature that IMF can alter pulmonary function, most of the surgeons surveyed seemed to believe that this effect was not the same.

The vast majority of surgeons concurred that IMF was stressful for the patient, while a sizable portion (42.42%) of them found it challenging to persuade the patient during an IMF phase. 79% of the participants reported that the oral hygiene status among patients receiving IMF was fair.

DISCUSSION:

There are many restrictions and issues with rigid internal fixation. Due to these restrictions, the miniplate system, which was simpler to use and offered similar positive outcomes⁷. The most recent developments in advanced biomaterials would be incorporated into the optimal treatment paradigm for mandible fractures, which would retain stability at the fracture site, show how to use it easily, and permit immediate function with release from intraoperative IMF (if used)¹¹.

Clinicians have been working to eliminate IMF while minimising the risk of infection and non-union in an effort to get closer to that aim. Patients who get IMF for an extended length of time may have more severe issues and differences than those who receive rapid mobilisation⁵. Immediate function after ORIF appears to have many advantages, including improved speech, better feeding, a lower risk of complications, and better healing through micromovements¹³.

Osteoporosis, hypercapnia, hypoxia, and reduced Ph in the nutritional veins of immobile bones are all risks posed by IMF. Depending on when function is restored, these modifications are reversible to varied degrees. Regarding allergies to IMF-related materials, only one case has been documented⁷. Animal studies indicate that five weeks of IMF may cause the cross-sectional areas of the masseter and temporalis muscle fibres to atrophy, weaken, and shrink. If IMF is used for a prolonged period of time, it may cause condylar alterations in the TMJ⁸. Our survey revealed that a significant number of oral surgeons are still exclusively employing IMF to treat patients. Dentate segment fractures in the mandibular despite being an outdated approach given the developments in armamentarium and instruments. A large majority of Postoperative IMF seemed to be used by oral surgeons on consistently (51.51%). The evidence supporting such a Practice is in doubt. The idea behind employing postoperative IMF is to be replaced by ORIF⁹.

There are several indications for perioperative IMF, which includes: a favoured technique for reducing fractures by lack of an operator or supervisory consultant; operating with a properly qualified help; the presence showing a possible condylar fracture, either unilateral or bilateral need elastic intermaxillary bands or postoperative IMF traction; and pre-planned IMF following surgery to immobilise the jaw and safeguard the fixation, which possibly as a result of soft internal fixation of poor quality fractures (bone or comminuted), active infection, or potential patient noncompliance with postoperative care of the fracture sites (for example, failing to use a diet (soft))¹².

The overall complication rates are favourable when compared to recent reviews of other studies. Infection rates which are reported lie within a range is 0% to 14.6%, with a mean of 6.7% versus 4% in the current study. Overall We had a 19% early malocclusion rate with a 3% overall 4% of early reoperations for malreduction needed a small occlusal modification eventually. These Comparing the values to 17%, 0.5%, and 8%, respectively by the Renton et al. in a review. The majority of the surgeons who responded to this study thought that the best strategy for using postoperative IMF was occlusion¹⁰. Most surgeons based their decision of the duration of postoperative IMF on the occlusion. Despite the fact that there are no trials to conclusively show a clear advantage with normal postoperative IMF when compared to immediate function, the majority of surgeons (70%) considered that routine postoperative IMF gives more advantageous occlusion following internal fixation^{5,7}. The neuromuscular flexibility of IMF is its sole significant benefit. It does not appear that stabilising occlusion with a regular IMF interval after ORIF has been scientifically shown. To the best of our knowledge, there does not appear to be any scientific research supporting the routine use of postoperative IMF after ORIF in the literature. In contrast, Kaplan et al. and Pedersen et al. reported in their separate trials that patients who underwent immediate mobilisation after ORIF demonstrated comparable outcomes to those of patients who underwent IMF after ORIF^{7,8}. If handled correctly, internal fixation of fracture fragments using plates and screws results in rigid immobilisation of fracture fragments, which logically leads to the elimination of postoperative IMF as a standard treatment. This has a double benefit in that it prevents the negative and undesirable consequences of a protracted IMF period and also accelerates the recovery of the patient to normal function, hence shortening the postoperative morbidity period. Despite these clear advantages, the majority of surgeons continue to prefer routine postoperative IMF treatment^{11,8}.

According to a number of scientific research, IMF is not required while

doing internal fixation. The surgeon can maximise surgical efficiency through time and money savings, operative safety, and postoperative patient comfort without compromising the success of the treatment by forgoing the use of perioperative IMF. Wiring can therefore be completely avoided in the majority of patients if IMF is not habitually employed in the postoperative phase, saving the surgeon time and effort and, more importantly, preventing stress for the patient. Instead than continuing with venerable procedures that lack a solid scientific foundation, evidence-based practise is urgently needed to enable surgeons to provide patients with additional benefits.

REFERENCES:

1. Rowe NL, Killey HC. Fractures of the facial skeleton, 2nd edn. Edinburgh: E & S Livingstone, 1968.
2. Champy M, Lodde JP, Jaegar JM, Wilk A, Jerber JC. Mandibular osteosynthesis according to the Michelet technique. I. Biomechanical basis. II. Presentation of new material. *Rev Stomatol Chir Maxillofac* 1976; 77: 569–582.
3. Champy M, Lodde JP. Mandibular synthesis. Placement of the synthesis as a function of mandibular stress. *Rev Stomatol Chir Maxillofac* 1976; 77: 971–976.
4. Michelet FX, Deymes J, Dessus B. Osteosynthesis with miniaturised screwed plates in maxillofacial surgery. *J Maxillofac Surg* 1973; 1: 79–84.
5. Renton TF, Wiesenfeld D. Mandibular fracture osteosynthesis: a comparison of three techniques. *Br J Oral Maxillofac Surg* 1996; 34: 166–173. 2008;66:2116–22.
6. Fordyce AM, Lalani Z, Songra AK, Hildreth AJ, Carton AT, Hawkesford JE. Intermaxillary fixation is not usually necessary to reduce mandibular fractures. *Br J Oral Maxillofac Surg* 1999;37:52–7.
7. Kaplan BA, Hoard MA, Park SS. Immediate mobilization following fixation of mandible fractures: A prospective, randomized study. *Laryngoscope* 2001;111:1520–4.
8. Sindet-Pedersen S, Jensen J. Treatment of mandibular fractures with or without intermaxillary fixation—a comparative study. *Oral Surg Oral Diagn* 1992;3:37–44.
9. Hardt AB. Early metabolic responses of bone to immobilization. *J Bone Joint Surg Am* 1972; 54:119–24.
10. Hashitani S, Maeda T, Okui S, Takaoka K, Honda K, Urade M. Allergy to metal caused by materials used for intermaxillary fixation: Case report. *Br J Oral Maxillofac Surg* 2008; 46:315–6.
11. Mayo KH, Ellis E 3rd, Carlson DS. Histochemical characteristics of masseter and temporalis muscles after 5 weeks of maxillomandibular fixation: An investigation in *Macaca mulatta*. *Oral Surg Oral Med Oral Pathol* 1988; 66:421–6.
12. Lydiatt DD, Davis LF. The effects of immobilization on the rabbit temporomandibular joint. *J Oral Maxillofac Surg* 1985; 43:188–93.
13. Williams JG, Cawood JI. Effect of intermaxillary fixation on pulmonary function. *Int J Oral Maxillofac Surg* 1990; 19:76–8.
14. Arthur G, Berardo N: A simplified technique of maxillomandibular fixation. *J Oral Maxillofac Surg* 47:1234, 1989
15. Schneider AM, David LR, De Franco AJ, et al: Use of specialized bone screws for intermaxillary fixation. *Ann Plast Surg* 44:154, 2000