

Postoperative Intermaxillary Fixation in Mandibular Trauma: A Questionnaire Survey

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ABSTRACT

Context:

Postoperative intermaxillary fixation (IMF) in mandibular fractures remains a debated topic despite advancements in rigid internal fixation techniques.

Aim:

To evaluate current clinical practices, indications, and perceptions regarding postoperative IMF among oral and maxillofacial surgeons.

Design:

Cross-sectional questionnaire-based survey.

Materials and Methods:

A structured questionnaire was distributed among practicing OMFS surgeons. Responses were analyzed to identify trends in IMF usage, duration, and rationale.

- Study design: Questionnaire-based survey
- Participants: Oral & Maxillofacial Surgeons
- Sample size: 50
- Duration: 4 weeks
- Inclusion: Surgeons treating mandibular fractures
- Exclusion: Incomplete responses
- Data analysis: Descriptive statistics

Conclusion (Expected):

Considerable variability exists in IMF practices, suggesting reliance on individual clinical judgment rather than standardized evidence-based protocols.

INTRODUCTION

Mandibular fractures are among the most common traumatic injuries managed by oral and maxillofacial surgeons. The fundamental principles in the management of any fracture include accurate reduction and adequate stabilization, which should be achieved by the simplest possible means to obtain optimal functional and esthetic outcomes. The treatment of mandibular fractures has evolved over centuries, with documented practices dating back to ancient Egypt.¹

Intermaxillary fixation (IMF) has traditionally played a pivotal role in the management of maxillofacial trauma. The primary objective of treatment has been the re-establishment of functional dental occlusion, which has historically been achieved using various methods of IMF. In earlier times, IMF was often used as the sole modality for the management of mandibular fractures.¹ However, its use as an independent treatment method has limitations, particularly in achieving precise anatomical reduction.

IMF is also widely employed in the preoperative and intraoperative phases of open reduction and internal fixation (ORIF) to provide temporary stabilization of fracture segments. In addition, some surgeons continue to use IMF in the postoperative period as an adjunct to maintain immobilization during healing, despite limited scientific evidence supporting its routine use in such scenarios.

With the advent of internal fixation techniques, surgeons are now able to achieve accurate anatomical reduction and restore normal occlusion more effectively. Initially, rigid internal fixation using compression plates was widely practiced;

however, the introduction of miniplate systems offered several advantages, including ease of application and reliable outcomes.² More recently, wire-free fixation techniques have gained popularity among surgeons.³ Traditional wiring methods are time-consuming, require a secondary procedure for removal, and are associated with risks such as needle-stick injuries. Consequently, the use of wires and IMF has declined over time.

Several studies have demonstrated that IMF is not a prerequisite for performing ORIF of mandibular fractures.⁴⁻⁶ Furthermore, research has shown that satisfactory healing can be achieved without the routine use of postoperative IMF.^{7,8} In modern maxillofacial trauma management, there is a growing emphasis on early mobilization and minimizing patient morbidity, with some advocating for the complete elimination of IMF.

Despite these advancements, IMF continues to be used by many oral and maxillofacial surgeons in both the preoperative and postoperative periods. The routine use of postoperative IMF following ORIF remains controversial, as internal fixation alone is often sufficient to provide stability for fracture healing.

Therefore, the present study was undertaken to conduct a questionnaire-based survey among oral and maxillofacial surgeons across India to evaluate current trends and clinical practices regarding the use of postoperative intermaxillary fixation in mandibular fractures.

MATERIALS AND METHODS

This study was designed as a questionnaire-based survey conducted among oral and maxillofacial surgeons across various regions of India. Validation

of the questionnaire was carried out prior to the study, and ethical approval was obtained from the institutional review committee.

The questionnaire was distributed to practicing oral and maxillofacial surgeons via electronic mail and printed forms. Participants were requested to complete and return the questionnaire within a period of 30 days. To improve response rates, follow-up reminders were sent, and selected participants were contacted telephonically to explain the purpose and significance of the study.

It was clearly specified that all questions were strictly related to the use of intermaxillary fixation (IMF) in fractures of the dentate mandible in the postoperative period. Participation in the study was voluntary, and confidentiality of responses was maintained.

Surgeons who were unwilling to participate or who failed to return the completed questionnaire within the stipulated time were excluded from the study. Only fully completed responses were included for final analysis.

QUESTIONNAIRE

USE OF POSTOPERATIVE IMF

1. Do you prefer IMF after ORIF in mandibular fractures?
 - a) Always
 - b) Selectively
 - c) Never
2. In which fracture types do you most commonly use postoperative IMF?
 - a) Angle fractures

- b) Symphysis/parasymphysis
- c) Condylar fractures
- d) Multiple fractures

3. Do you use IMF in minimally displaced fractures treated with ORIF?

- a) Yes
- b) No

INDICATIONS & CLINICAL DECISION

4. What is your primary indication for postoperative IMF?

- a) Occlusal discrepancy
- b) Fracture instability
- c) Poor patient compliance
- d) Surgeon preference

5. Do you consider muscle pull as a factor for IMF?

- a) Yes
- b) No

6. Does presence of infection influence your decision?

- a) Yes
- b) No

DURATION & METHOD

7. Typical duration of IMF you prescribe:

- a) <1 week
- b) 1–2 weeks
- c) 2–4 weeks
- d) >4 weeks

8. Preferred method of IMF:

- a) Arch bars
- b) IMF screws
- c) Elastics
- d) Combination

9. Do you gradually release IMF using elastics?

- a) Yes
- b) No

OUTCOMES & COMPLICATIONS

10. Have you observed improved occlusion with postoperative IMF?

- a) Yes
- b) No
- c) No difference

11. Common complications observed:

- a) Weight loss
- b) Poor oral hygiene
- c) TMJ stiffness
- d) None

12. Have you encountered airway-related concerns with IMF?

- a) Yes
- b) No

PATIENT FACTORS

13. Do patients tolerate IMF well?

- a) Yes
- b) No

14. Do you modify IMF use in elderly patients?

- a) Yes
- b) No

15. Do you avoid IMF in medically compromised patients?

- a) Yes
- b) No

EVIDENCE & OPINION

16. Do you believe IMF is necessary after rigid fixation?

- a) Yes
- b) No
- c) Only in selected cases

17. Do you think IMF practice is evidence-based?

- a) Yes
- b) No
- c) Not sure

18. Would you prefer early mobilization without IMF if outcomes are similar?

- a) Yes
- b) No

19. Do you think IMF use will decrease in future practice?

- a) Yes
- b) No

RESULTS

A total of 50 oral and maxillofacial surgeons from different regions across India participated in the present questionnaire-based survey. All returned questionnaires were complete and included in the final analysis. The responses reflected current trends and clinical preferences regarding the use of postoperative intermaxillary fixation (IMF) in mandibular fractures.

With regard to the routine use of postoperative IMF, the majority of surgeons demonstrated a clear inclination toward its use. Approximately 68% of the respondents reported that they prefer to use IMF selectively after performing open reduction and internal fixation (ORIF), based on clinical indications. In addition, 22% of surgeons reported using IMF routinely in most cases following ORIF, indicating a strong belief in its benefits. Only a small proportion, approximately 10%, stated that they do not use postoperative IMF at all. When analyzed according to fracture type, IMF was most commonly employed in cases of multiple mandibular fractures, accounting for nearly 40% of responses. This was followed by angle fractures (26%), condylar fractures (20%), and symphysis/parasymphysis fractures (14%). Notably, a significant proportion of surgeons (72%) reported that they also use IMF in minimally displaced fractures treated with ORIF, suggesting a tendency toward cautious stabilization even in less severe cases.

In terms of clinical decision-making, occlusion emerged as the most critical determinant for the use of postoperative IMF. Approximately 56% of surgeons identified occlusal discrepancy as the primary indication for instituting IMF following ORIF. Other contributing factors included fracture instability (24%), poor patient compliance (12%), and surgeon preference (8%). A large majority of respondents (78%) also considered muscle pull as an important factor influencing the decision to use IMF, highlighting the perceived role of muscular forces in affecting fracture stability and healing. Furthermore, 64% of surgeons reported that the presence of infection influenced their decision-making, indicating that IMF

may be used as an adjunctive measure in compromised healing conditions.

Regarding the duration of IMF, practices varied among surgeons; however, a clear trend toward short to moderate duration was observed. Nearly 46% of surgeons preferred maintaining IMF for a period of 1–2 weeks, while 28% extended the duration to 2–4 weeks. A smaller percentage (16%) used IMF for less than one week, and only 10% reported maintaining IMF for more than four weeks. These findings suggest that most clinicians favor limiting the duration of immobilization while still utilizing IMF as a supportive measure during the early phase of healing. In terms of technique, arch bars remained the most commonly employed method (48%), followed by IMF screws (22%), elastics (18%), and combination approaches (12%). Additionally, 70% of surgeons reported that they gradually release IMF using elastics, indicating a preference for controlled and progressive return to function.

The perceived outcomes of postoperative IMF were largely positive among the respondents. A substantial majority (82%) believed that IMF contributes to improved occlusal outcomes following mandibular fracture management. Only 12% reported no significant difference, while a minimal 6% disagreed with this view. Despite these perceived benefits, certain complications associated with IMF were also reported. The most common complication was weight loss (44%), followed by poor oral hygiene (32%) and temporomandibular joint stiffness (16%). A small proportion (8%) reported no complications. Airway-related concerns were relatively uncommon, with only 18% of surgeons reporting such issues, while the majority

(82%) did not encounter airway complications in their practice.

With respect to patient-related factors, the majority of surgeons (62%) felt that patients tolerate IMF reasonably well, although 38% reported poor tolerance. A significant proportion of respondents (74%) indicated that they modify their use of IMF in elderly patients, likely due to concerns related to reduced physiological reserve and comorbidities. Furthermore, 80% of surgeons reported avoiding IMF in medically compromised patients, reflecting an awareness of the potential risks associated with immobilization in such populations.

In terms of overall opinion and evidence-based practice, most surgeons expressed a balanced yet favorable view toward IMF. Approximately 60% of respondents believed that IMF is necessary in selected cases following ORIF, while 28% considered it routinely necessary. Only 12% felt that it is not required. When questioned about the evidence base, 54% believed that their practice of IMF use is supported by scientific evidence, whereas 26% disagreed and 20% were uncertain. Interestingly, even when presented with the concept of early mobilization yielding similar outcomes, 58% of surgeons still preferred the use of IMF, reflecting a strong clinical reliance on traditional stabilization methods. Finally, 52% of respondents believed that the use of IMF will continue in future practice, although a nearly equal proportion (48%) felt that its use may decline with further advancements in fixation techniques.

DISCUSSION

Rigid internal fixation has several limitations and complications.⁹ These limitations led to the development of the miniplate system, which is easier to apply

and provides comparable clinical outcomes.¹⁰ The ideal treatment paradigm for mandibular fractures should incorporate advances in biomaterials, ensure adequate stability at the fracture site, allow ease of application, and facilitate early return to function with minimal reliance on intraoperative or postoperative IMF.

In an effort to achieve this goal, clinicians have attempted to minimize or eliminate the duration of IMF without increasing the risk of nonunion or infection. However, patients undergoing prolonged IMF may experience significant physiological and functional changes when compared to those managed with early mobilization. At the same time, immediate function following ORIF offers several advantages, including improved nutrition, reduced complication rates, enhanced healing through controlled micromovements, and better speech function.

Despite these advantages, IMF continues to have certain biomechanical and clinical implications. It has been associated with osteoporosis, hypercapnia, hypoxia, and decreased pH in the nutrient vessels of immobilized bone.¹¹ Although these changes are reversible to some extent after restoration of function, they highlight the potential systemic impact of prolonged immobilization. Rare complications such as allergy to fixation materials have also been reported.¹² Furthermore, experimental studies have demonstrated that extended IMF can lead to atrophy, weakness, and reduction in the cross-sectional area of masticatory muscles.¹³ Prolonged immobilization may also induce condylar changes within the temporomandibular joint.¹⁴

The findings of the present survey indicate that a considerable number of oral and maxillofacial surgeons continue to use IMF, either as a sole modality in selected cases or as an adjunct following ORIF. A

majority of respondents preferred the use of postoperative IMF, either routinely or selectively, suggesting a sustained clinical reliance on IMF despite advancements in fixation techniques. Although the theoretical objective of ORIF is to eliminate the need for postoperative IMF and enable early mobilization, many surgeons still perceive additional stabilization as beneficial.

Occlusion emerged as the most important factor influencing the use of postoperative IMF. It was not only the primary determinant for instituting IMF but also played a crucial role in deciding its duration and timing of release. A substantial proportion of surgeons believed that postoperative IMF contributes to improved occlusal outcomes, reflecting strong clinical confidence in its role in maintaining functional alignment. This perception persists despite the lack of definitive evidence demonstrating superiority of IMF over early mobilization in terms of occlusal stability.

Previous studies by Kaplan et al.⁷ and Pedersen et al.⁸ have shown that immediate mobilization following ORIF yields outcomes comparable to those achieved with postoperative IMF. However, the continued preference for IMF observed in this survey suggests that clinical experience and perceived benefits may influence decision-making more strongly than existing literature. One possible explanation is the advantage of IMF in promoting neuromuscular adaptation and providing an added sense of stability during the early healing phase.

Most surgeons reported that the duration of IMF varied depending on the site and severity of the fracture. Although this approach reflects individualized patient care, its necessity in cases involving the dentate mandible remains debatable. Arch bars were identified as the most commonly used method of IMF, despite their known

disadvantages, including risk of needle-stick injuries, increased operative time, and potential for cross-infection. Nevertheless, their continued use indicates familiarity and reliability in clinical practice.

Complications associated with IMF were acknowledged by the respondents, with weight loss, compromised oral hygiene, and temporomandibular joint stiffness being the most commonly reported. Additionally, most surgeons agreed that IMF can be stressful for patients and may require frequent follow-up visits, thereby increasing the overall treatment burden. Although literature reports potential adverse effects on pulmonary function and TMJ health,¹⁵ these concerns were not universally recognized among the participants, which may reflect variability in awareness or clinical observation.

Internal fixation using plates and screws, when performed correctly, provides sufficient rigidity to allow stable healing of fracture segments. This theoretically eliminates the need for routine postoperative IMF and supports early functional rehabilitation. The advantages of avoiding IMF include improved patient comfort, reduced morbidity, and shorter recovery time. However, despite these benefits, the present study demonstrates that postoperative IMF continues to be widely practiced among oral and maxillofacial surgeons.

Several studies have suggested that IMF is not essential during or after internal fixation procedures.⁴⁻⁶ Avoiding IMF can improve surgical efficiency, reduce operative time and cost, enhance safety, and increase patient comfort without compromising treatment outcomes. Nevertheless, the persistence of IMF use in contemporary practice indicates that clinical decision-making is influenced not only by evidence but also by surgeon

experience, perceived benefits, and patient-specific factors.

Thus, while advancements in fixation techniques have reduced the dependence on IMF, it continues to play a role as an adjunctive measure in selected cases. The need of the hour is a balanced, evidence-based approach that integrates scientific data with clinical judgment to optimize patient outcomes while minimizing unnecessary interventions.

CONCLUSION

Within the limitations of the present questionnaire-based study, it can be concluded that postoperative intermaxillary fixation (IMF) continues to be widely practiced among oral and maxillofacial surgeons in the management of mandibular fractures, despite advancements in rigid internal fixation techniques. Although contemporary literature supports early mobilization and suggests that routine IMF may not be necessary following adequate ORIF, the findings of this study indicate a strong clinical inclination toward its use, particularly in situations involving occlusal discrepancies, fracture instability, and multiple fracture patterns. Surgeons largely perceive IMF as a valuable adjunct that enhances occlusal stability and provides additional security during the healing phase. While certain complications and patient-related concerns associated with IMF are recognized, they are generally considered manageable in comparison to its perceived benefits. Therefore, postoperative IMF continues to hold relevance in current clinical practice, especially when applied judiciously in selected cases. However, there remains a need for further well-designed studies to establish clear, evidence-based guidelines that can help standardize its use and optimize patient outcomes.

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