Changing Trends in the Treatment of Mandibular Fracture

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Int Arch Otorhinolaryngol 2018;22:195–196.

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Excluding nasal fractures, mandibular fractures are the most common fractures of the facial bones. A functioning intact mandible is essential for biting, chewing and speaking.[1]

The first description of a mandibular fracture dates back to 1650 BC, and an Egyptian papyrus describes the examination, diagnosis and treatment of mandibular fractures. Hippocrates was the first to mention the reapproximation and immobilization of the fractured mandible utilizing circumdental wires and external bandaging. The importance of first establishing proper dental occlusion was highlighted in the textbook written by Roger of Salerno in Italy in 1180. Rigid maxillomandibular fixation (MMF) was first mentioned in 1492, in an edition of the book *Cirugia*, which was printed in Lyons, France. Moreover, rigid internal fixation was developed and popularized by Spiessel in Europe in 1970s.[2,3]

The purposes of the treatment of mandibular fractures are to restore the pre-trauma dental occlusion and normal mouth opening and to reduce the displaced fracture.[4]

Open reduction/internal fixation (OR/IF) has dramatically revolutionized the approach to mandible fractures, minimizing the postoperative role of rigid MMF. But MMF is still used to maintain proper occlusion until the IF of the fracture is performed.[4–6]

Traditionally, closed reduction and OR/IF using wire osteosynthesis require an average of 6 weeks of immobilization by MMF in order to achieve satisfactory healing. Negative sequelae associated with this extended period of immobilization include airway problems, poor nutrition, weight loss, poor oral hygiene, speech difficulties, social inconvenience, insomnia, patient discomfort, work difficulties, and difficulty in retrieving the normal opening range of the jaw. In contrast, rigid and semirigid fixation of the mandible fractures enables early mobilization and restoration of normal jaw mobility, improved nutritional status, improved speech and oral hygiene, patient comfort and an early return to work.[7,8]

Immediate postoperative release of the rigid MMF after OR/IF using titanium miniplate(s) was confirmed to be as effective and safe as maintaining postoperative rigid MMF for different durations.[5,6] However, the use of rigid intraoperative MMF increases the operative time, cost, blood-transmitted diseases to patients and/or the surgical team and the risk of tooth injury. These factors opened the door for recent studies searching for simpler, faster, easier and at the same time effective OR/IF of the fractured mandible.[4]

After a prospective comparative study, El-Anwar et al[4] found that manual MMF (3MF) during the OR/IF of selected cases of mandibular fractures could be successfully performed, allowing for a more rapid and less complex procedure limited to the mandible. In addition to the gained benefits of immediate postoperative mandible mobilization, 3MF provided significantly shorter operative times ($p < 0001$), less risk of blood-transmitted diseases to the surgical team and the patient, and significantly better early mouth opening ($p = 0.0015$).

In a later study of the the advantages of the rapid 3MF procedure that is limited to the mandible, El-Anwar and Hegab[9] were the first to investigate the 3MF repair of fractured mandibles under regional anesthesia comparing the results with a control group in which 3MF was performed under general anesthesia (GA). They used an extraoral mandibular nerve block, and concluded that regional anesthesia can replace GA in the OR/IF of selected cases of mandibular fracture (parasymphyseal fracture) without reported complications, providing an optimal solution when GA is not recommended or contraindicated.

More studies applying regional anesthesia in other types of mandibular fracture are expected to be conducted in the near future. The maxillofacial surgeons' awareness of those easier and reliable alternatives needs to be increased so these simpler and effective repairs become more popular.

When there is a need to maintain a postoperative rigid MMF, various methods have been employed over time. Even

received
April 5, 2017
accepted
August 24, 2017
published online
October 25, 2017

DOI https://doi.org/10.1055/s-0037-1606645.
ISSN 1809-9777.

though arch bars are effective for rigid MMF, they are not devoid of negative aspects. Intermaxillary fixation (IMF) screws are similarly effective for rigid MMF regarding postoperative occlusion and MMF stability. Additionally, IMF screws have the advantages of decreasing the surgical time and gloves perforations, and of enabling better patient acceptance and oral hygiene. Accidental root perforation is the only limitation to IMF screws.[10]

The treatment of mandibular angle fractures represents a challenge due to their higher rate of complications, and there is currently no agreement as to the optimal treatment. The percutaneous approach using the transbuccal trocar technique provides easy access and fixation of the screws. Recently, El-Anwar and Sweed[11] described a new, effective and simple percutaneous transbuccal approach using a modified cover of the cannula as a disposable available trocar for the admission and conduction of a microdrill shaft and screw driver directly to the fracture.

The familiarity with and popularity of these simpler effective trends in mandibular fracture repair will be very beneficial for surgeons, patients and the community in general.

Financial Support
The author received no financial support to write this letter.

Conflicts of Interest
The author has no conflicts of interest to disclose.

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