

Apical Force Application in the Management of Dentoalveolar Fractures: Indications, Procedure and Limitations

Amin Rahpeyma ¹, Saeedeh Khajehahmadi ²

¹ Associate Professor of Oral and Maxillofacial Surgery, Oral and Maxillofacial Diseases Research Center, School of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran.

² Assistant Professor of Oral and Maxillofacial Pathology, Dental Research Center, School of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran.

Received 27 April 2015 and Accepted 6 June 2015

Dentoalveolar fracture is defined as a fracture in the bone surrounding the teeth without any extension to the basal bones of the maxilla or mandible (1). As for other parts of the facial skeleton, the treatment strategy for dentoalveolar fractures consists of fracture reduction, fixation and immobilization (2); however, some dentoalveolar fractures are difficult to treat.

In some dentoalveolar fracture cases, even after proper fracture reduction, the incisal edges of the teeth in the fractured segment remain slightly above the occlusal plan. Apical force will resolve the problem by leveling the incisal edges.

Maintaining apical pressure is possible by the following ways:

- Maxillomandibular fixation (MMF)
- Circummandibular wiring
- Suspension to the Anterior Nasal Spine (ANS), lateral piriform, zygomatic buttress or the holes in the head of the screws used for intermaxillary fixation (IMF screw)

Maxillomandibular fixation has its own disadvantages. This technique is indicated when a fracture in the jawbone is also present. When this technique is used for the management of posterior maxillary dentoalveolar fracture, the vector of the apical force will be along the long axis of the teeth. MMF may give rise to some problems in eating, speaking and maintenance of oral hygiene. In addition, mandibular immobilization may have adverse effects on temporomandibular joint and masticatory system. As a result, this technique is not very popular in this topic (3). When the opposite teeth are lost as well, maxillomandibular fixation cannot exert any apical force (Fig. 1).

Rahpeyma A, Khajehahmadi S. Apical force application in the management of dentoalveolar fractures: Indications, procedure and limitations. *J Dent Mater Tech* 2015; 4(3): 115-6.

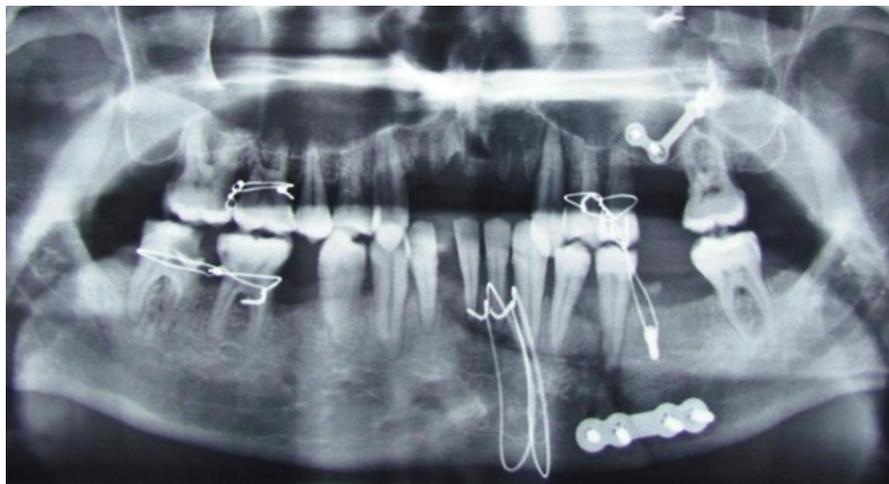


Figure 1. Circummandibular wiring is used to exert apical pressure to a fractured dentoalveolar segment. Although Mandibular incisors in fractured segment are hopeless, they are retained intentionally to help the fracture heals. If the prognosis of these teeth were good then arch bar could be used for three dimensional fixation and resistance against labiolingual movements.

Circummandibular wiring is indicated for both anterior and posterior mandibular fractures; preferably under general anesthesia. Since this technique alone is not sufficient for providing three-dimensional fixation after fracture reduction, it is better to be used in combination with an arch bar.

Suspension to the ANS is possible without any mucosal incision (transmucosal). Lateral piriform and zygomatic buttress are both accessible through intraoral incisions. The former suspension method is indicated for the management of maxillary anterior dentoalveolar fractures while the latter is used for posterior maxillary fractures. Special training is needed to do this procedure.

IMF screw should be inserted above the fracture lines in the maxilla or the mandible and dentoalveolar fracture is suspended to the holes in the screw head.

When apical force application to the fractured dentoalveolar segment is anticipated, then wire-composite technique should not be used for splinting because the apical force will debond the composite from the tooth surface. In such situations, wire only

techniques such as Essig wiring or conventional arch bar are the options.

References

1. Nyarady Z, Orsi E, Nagy K, Olasz L, Nyarady J. Transgingival lag-screw osteosynthesis of alveolar process fracture. *International journal of oral and maxillofacial surgery*. 2010;39:779-82.
2. Rahpeyma A, Khajehahmadi S, Barkhori Mehni S. Treatment of mandibular fractures by two perpendicular mini-plates. *Iranian journal of otorhinolaryngology*. 2014;26:31-6.
3. Romagnoli R, Bernardi M, Tagliente F, Aimetti M. [Effect of immobilization after treatment of mandibular fractures]. *Minerva stomatologica*. 1999;48:203-8.

Corresponding Authors:

Dental Research Center of Mashhad University of Medical Sciences
 Vakilabad Blvd, Mashhad, Iran
 Work Telephone Number: +98(51)38829501
 Work Fax Number: +98(51)38829500
 E.mail: khajehahmadis@mums.ac.ir