Arch Wire: A Novel Technique for Intra-Maxillary Fixation

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Abstract

Introduction Arch bars are regularly used in the management of dentoalveolar and minimally displaced fractures of the maxilla or mandible and luxation or avulsion of teeth by maxillofacial surgeons. The procedure for arch bar placement has remained unchanged over the period of years, and this coupled with the difficulty in maintenance of oral hygiene is a problem that begs attention.

Technique We have devised a technique to overcome these hurdles and achieve adequate intramaxillary splinting. The technique uses an arch wire and ligature wire assembly instead of the conventional arch bar.

Conclusion This technique is easy to learn and can thus be used as a rapid yet robust alternative to the conventional arch bar for dentoalveolar and minimally displaced fractures.

Keywords Intramaxillary fixation · Splinting · Arch bar

Introduction

The management of dentoalveolar and minimally displaced fractures of the maxilla or mandible and luxation or avulsion of teeth are routine procedures carried out by a maxillofacial surgeon. Arch bar placement has long been used as the

technique of choice for these injuries [1, 2]. The procedure for arch bar placement is tedious and not all patients can tolerate the relatively rigid and bulky arch bar [1]. Studies have also shown that periodontal status deteriorated after placement of arch bars; though it recovered after a period of 5 months after removal [3]. We have devised a technique to overcome these hurdles and achieve rapid intramaxillary fixation of dentoalveolar fractures, minimally displaced fractures and single or multiple tooth avulsion, luxation or intrusion. The technique can provide effective intermediate splinting and intramaxillary fixation for about 3–4 weeks.

Technique

In this technique, a single pre-stretched 24G wire of appropriate length is used. One end of this wire is held within the tip of the beaks of stout artery or wire forceps. The wire is then passed through the buccal interdental embrasure of the mesial aspect of one to two teeth mesial to the area of concern. The same end is then passed around the distal end of the same tooth and brought out buccally. The wire is then adapted along the buccal aspect of the teeth involved up to one to two teeth distal to the area of concern. The same procedure is then repeated to get the wire to pass around the distal anchor tooth. The wire is then adapted along the buccal aspect of the teeth and brought back to the mesial anchor where it is twisted and made into a loop. This completes the arch wire adaptation (Figure 1).

The fracture site is then manipulated to achieve the best possible reduction and 26G individual ligature wires are passed around the individual teeth between the two anchor teeth in the same manner as that for the conventional arch bars (Figs. 2, 3).

This technique incorporates the advantages of a more compact arch wire instead of the prefabricated and

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Fig. 1 Technique for adaptation of the arch wire **a** arch wire (24G) passed mesial to the mesial anchor tooth, **b** wire passed distally to emerge on buccal embrasure, **c** wire adapted on buccal aspect up to the mesial of distal abutment tooth and passed distally, **d** wire passed on mesial side to emerge buccally, **e** wire readapted and secured mesially

Fig. 2 Final wiring in place. Individual teeth secured using ligature wires (26G)

relatively bulky arch bar affording better oral hygiene maintenance. It is faster, economical and has a reduced incidence of needle stick injury and gingival trauma as

Fig. 3 Final wiring in place in occlusal view. Individual teeth secured using ligature wires (26G)

compared with arch bars. A possible drawback of the technique is its ability to achieve very limited Intermaxillary fixation or Maxillomandibular fixation (IMF/MMF). The technique has its principle application in the reduction and fixation of dentoalveolar fracture and minimally displaced fractures. The technique can also be used in cases of single or multiple teeth avulsion, luxation or intrusion. It is an excellent technique to rapidly achieve intramaxillary fixation in cases where arch bar placement is difficult, like in an uncooperative patient or in a patient with special needs.

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