



A Simple Manoeuvre for Promising Results - Opening the Winglets of an Arch Bar for Placement of screws: A Technical Note

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ABSTRACT

There are many fundamental appliances that aid for immobilization including splints, ligature wires and arch bars. At present tooth supported appliances that help in immobilization by intermaxillary fixation are most commonly used. In that list, the arch bars consist of half round, half oval or flat wires that are adapted along the labial surfaces of the teeth.

They contain elements such as hooks and eyelets that provide support. The use of both arch bars and IMF screws in unison has been studied previously as it combines the advantages of both of these systems. To achieve this purpose, drill holes are made in the space that lies between two winglets of an arch bar, through this, screws are placed at regular intervals in the inter radicular spaces to stabilize the arch bar to the cervical portions of the teeth. The disadvantage of this method, however is that the arch bar is more susceptible to fracture due the weakening of its structure caused by the creation of a perforation. In this technical note, a slight modification of the previous technique has been proposed to avoid the weakening of the arch bar, to successfully combine the benefits of both the arch bars and IMF screws.

KEYWORDS : Arch Bars, Winglets, Intermaxillary Fixation screws, immobilization

Introduction:

The three basic principles of fracture management include reduction, fixation and immobilization. There are many fundamental appliances that aid for immobilization including splints, ligature wires and arch bars. Historically, since the time of Hippocrates, extraoral bandages made of leather or cloth has been used for immobilization. Later, a combination of extraoral and intraoral appliances were developed by which the fractured teeth, alveolar process and the mandible were enveloped with metal and rubber device attached with bandages^[1].

At present tooth supported appliances that help in immobilization by intermaxillary fixation are most commonly used. In that list, the arch bars consist of half round, half oval or flat wires that are adapted along the labial surfaces of the teeth. They contain elements such as hooks and eyelets that provide support. Some of the types of arch bars are Sauer's, Hauptmeyer's, Schlapp and prefabricated arch bars like Jelenko, Winter, Erich and Niro^[1]. The advantages of arch bars include the reduced need for specialized instruments, ease of adaptation, flexibility to fit to the contours of the teeth and stability, especially in patients who require long term maxillomandibular fixation^[2].

Intermaxillary Screws introduced in 1989, have also been studied extensively to serve the purpose of immobilization^[3,4,5]. Of late, since 1999, self tapping screws have been used to achieve maxillomandibular fixation^[6]. The advantages of IMF screws include reduced risk of glove perforation, saving of operator's time and also since the introduction of plating system for the management of fractures, the time of immobilization has greatly reduced, necessitating only a temporary intermaxillary fixation which is a feasible option with IMF screws.

The use of both arch bars and IMF screws in unison has been studied previously as it combines the advantages of both of these systems. To achieve this purpose, drill holes are made in the space that lies between two winglets of an arch bar, through this, screws of diameter 1.5 mm, are placed at regular intervals in the inter radicular spaces to stabilize the arch bar to the cervical portions of the teeth^[7]. The disadvantage of this method, however is that the arch bar is more susceptible to fracture due the weakening of its structure caused by the creation of a perforation^[8,9,10]. In this technical note, a slight modifica-

tion of the previous technique has been proposed to avoid the weakening of the arch bar, to successfully combine the benefits of both the arch bars and IMF screws.

Technical Report:

The technique consists of opening of alternate winglets of the arch bar so that the surface area is increased and the arch bar is not weakened by the placement of a perforation (Fig 1). After the arch bar is adapted to the labial surfaces of the teeth, perforations are placed in the places where the winglets have been opened. The perforation is placed with a 701 bur, of diameter 1.1 mm so that 1.5 mm screws are inserted to fix the arch bar, at regular intervals in the inter radicular spaces so as not to damage the roots of the teeth (Fig 2). At normal circumstances, 4 screws would be sufficient to fix the arch bar. In such a situation, the arch bar can be comfortably fixed in the perforated areas with the other winglets being used for application of some form of intermaxillary fixation (Fig 3).

Discussion:

The disadvantages of using wires for fixation of arch bars include time consumption, perforation risk, and ischemic necrosis of the gingiva due to tightening of these wires, with loss of tooth vitality^[3,6]. The disadvantages of using IMF screws include subsequent screw loosening, accidental root perforation and mucosal coverage^[3,4]. With the use of screw supported arch bar, dual benefits of, avoidance of use of wire for supporting the arch bars and prevention of screw loosening due to application of the elastics on the arch bar, allowing the immobilization to be placed for a longer duration, can be achieved. Previously, for modifying an arch bar to an screw supported arch bar, perforation holes had been made in the spaces between the winglets^[7]. This technique carried the disadvantage of inadvertent fracture of the arch bar due to weakening of its structure caused by the perforation^[8,9,10]. Thus, creating a perforation in an expanded surface area proves to be a reliable solution. By the simple technique of opening up a winglet, the surface area can be increased to comfortably create a perforation. The application of the elastics supported by the arch bar reduces the risk of screw loosening. The disadvantage of mucosal coverage can be prevented by placing the screws close to the alveolar mucosa. The application of screws still carries the risk of root perforation

with it, which can be prevented by following a proper technique. Use of this simple maneuver, such as opening of alternate winglets, can greatly help in saving of time, along with deriving the dual benefits of both the arch bar and IMF screws systems in day to day practice. This small modification to bone supported arch bars can go a long way in achieving modifications in arch bars without significantly weakening its structure, so that they can be used for long term maxillomandibular fixation conveniently.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

A written informed consent form in the vernacular language was obtained from the individual participants before the procedure was performed.

The authors have no potential conflicts of interest.



Fig.1



Fig 2



Fig.3

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