Custom-Made Finger Guard to Prevent Wire-Stick Injury to the Operator's Finger while Performing Intermaxillary Fixation

Ramesh Kumaresan, BDS, MDS¹ Karthikeyan Ponnusami, BDS, MClint Dent²
Priyadarshini Karthikeyan, BDS, MDS³

¹ Academic Unit of Craniofacial Clinical Care, AIMST University, Bedong, Kedah, Malaysia

² Faculty of Dentistry, AIMST University, Bedong, Kedah, Malaysia

³ Department of Oral Medicine and Radiology, Sree Balaji Dental College, Chennai, Tamil Nadu, India

Address for correspondence Ramesh Kumaresan, BDS, MDS, Academic Unit of Craniofacial Clinical Care, AIMST University, Jalan Semeling-Bedong, Bedong, Kedah 08100, Malaysia (e-mail: rame1264@gmail.com).

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Abstract

The treatment of maxillofacial fractures involves different methods from bandages and splinting to methods of open reduction and internal fixation and usually requires control of the dental occlusion with the help of intermaxillary fixation (IMF). Different wiring techniques have been used to aid in IMF including placement of custom-made arch bars, eyelet etc. However, these wiring techniques are with a constant danger of trauma to the surgeon's fingers by their sharp ends. Though there exist a variety of commercially available barrier products and customized techniques to prevent wire-stick injury, cost factor, touch sensitivity, and comfort aspect restrain their acquirement and exploit. This technical note describes the construction of a simple and economical finger guard made of soft thermoplastic material that provides an added protection to fingers from wire-stick type injuries, and its flexible nature permits a comfortable finger flexion movement and acceptable touch sensitivity. This is a simple, economical, reusable puncture, and cut-resistance figure guard by which we can avoid wire-stick type injury to the operator's fingers during wiring technique.

Keywords

- ▶ wire-stick injury
- ▶ finger guard
- ▶ intermaxillary fixation
- ▶ percutaneous injury

Wiring technique remains an important component in the treatment of maxillofacial trauma either to reduce the fractured segments, to secure an Erich arch bar, or to achieve intermaxillary fixation (IMF).¹ These wires has the potential for inadvertent puncture of the glove and can cause percutaneous injury to the operator's finger thereby increasing the risk of spread of blood borne diseases.² The reported incidence of such hazards is significantly high that ranges from 18.6 to 21%.^{1,3} However, most of these injuries occurred in the operating room, where only a fraction of injuries are reported and hence their true frequency may be much higher. Studies have concluded that the sharp injuries are more common to the fingers of the surgeons than other part of the hand.⁴ Hence the authors believe that the fingers require more

protection from needle-stick injury than any other part of the hands. The use of IMF screws avoid the chance of needle-stick injury; however, the common problem encountered during their placement is the inaccurate alignment of the screw and when the screws are loaded with elastic traction a considerable number become loose. Therefore, they cannot be relied on for an extended use. Various techniques were introduced to avoid wire-stick complications during arch bar placement, which includes double gloving technique or use of dynaplast adhesive tape over all the finger tips.² But the sticky nature of adhesive dynaplast may be uncomfortable to few operators. Barrier products for the prevention of punctures to the fingers are now available, such as cut-resistant gloves and puncture-resistant adhesive pads; however, the

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Figure 1 Positive replicas of the operator's fingers with a plaster base.

issues of flexibility, touch sensitivity, and cost factor are of importance to users. Hence, as a considerable addition to these techniques, herewith, we recommend a custom-made finger guard made of soft thermoplastic material to avoid such hazards.

Technique

Positive replicas of the operator's fingers are made with dental stone, to include the required length of the fingers,

Figure 2 Preparation of finger guard in a thermoform vacuum machine.

Figure 3 Thermoplastic finger guards capped over the fingers.

Figure 4 Comfortable finger flexion movement with figure guard and glove in place.

preferably the full length of the fingers. A plaster base of 1 to 1.5 cm is laid at the proximal end of the finger replicas (►Fig. 1). Finger guards are prepared for each of the replicas using soft thermoplastic material of 1 mm thickness using thermoform vacuum machine (►Fig. 2). These thermoplastic finger guards can be capped over the fingers before wearing the gloves (►Fig. 3). It provides an additional protection from wire-stick type injuries, and its thin and flexible nature permits a comfortable finger flexion movement (►Fig. 4) with a passable tactile sensation during the wiring technique. The finger guard can be reused following disinfection with any disinfectants in a similar way as disinfecting a soft splint before an orthognathic surgery.

Conclusion

This is a simple, economical, reusable, and custom-made figure guard by which we can avoid percutaneous injury to the operator's fingers during IMF.

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