

A SIMPLIFIED JIG FOR MINISCREW PLACEMENT

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Abstract

Implants have long been known as temporary anchorage devices serving the purpose of absolute anchorage to bring about effective tooth movement of dentoalveolar tissues. Precise positioning of mini-implants is extremely important for their success. There is an increased risk of implant failure if the mini-implants are inserted too close to the roots of adjacent teeth. If placed improperly, they may interfere with orthodontic tooth movement. Various methods are mentioned in the literature, some of which include the use of an adjustable surgical guide, a grid for accurate mini-implant placement, or a three-dimensional computer-aided design/computer-assisted manufacture (CAD/CAM) template. Although these methods aid in accurate placement of mini-implants, the techniques involve the use of complicated, cumbersome devices that cannot be fabricated chairside. This article provides an insight to a simplified way for chair-side fabrication of a jig that can help in reducing the risk of damage to adjacent dental roots, reducing the operator-patient time and improving the patient comfort and compliance.

Key words: Miniscrew, Jig, Temporary Anchorage Devices

Introduction

In recent years, mini-Screws have added new horizons in clinical Orthodontics. Mini-screws used for skeletal anchorage offer many clinical advantages: small size, wide range of implantation sites, ease of insertion and removal, the ability to load forces immediately and rapid healing.¹ The risk of injury to dental roots during placement is one of the greatest concerns with orthodontic mini-implants, especially when they are inserted between teeth. Placement of a mini-screw too close to the root can also result in insufficient bone remodeling around the screw and transmission of occlusal forces through the teeth to the screw, which can lead to implant failure.² Even though periodontal structures can heal after being injured by TADS, it is important to carefully select insertion sites using clinical and radiographic evaluation of their anatomical details.³ However, the success of miniscrew implant is mostly dependent on bone density⁴ and accuracies in horizontal and vertical placement. Precise positioning of mini-implants is extremely important for their success. We have developed a guide for the accurate placement of mini-implants that is simple in design and easy to use chairside.

The procedure Jig fabrication is as follows:

1. Intraorally, the observation of the final location of the jig is done between the roots of the second premolar and mesiobuccal root of the first molar. Mini screw insertion site is located by firmly pressing the long end of a periodontal probe against the buccal side of gingival tissue. Once the mini-screw placement area has been determined clinically a Radiovisiography (RVG) with a parallax technique (XV3) is taken to show the location of adjacent roots.
2. Simple wire jig is fabricated by using 0.017 X 0.025 inch or 0.019 X 0.025 inch stainless steel wire. A helix approximately 4 mm diameter is made. The appropriate length of the jig is determined by desired mini-screw insertion point, generally 5-6 mm apical to the alveolar

crest. After vertical height is determined horizontal bend is placed either on mesial or distal side at the level of



Figure 1: Jig fabrication with rectangular Stainless steel wire



Figure 2: Jig in position in the oral cavity

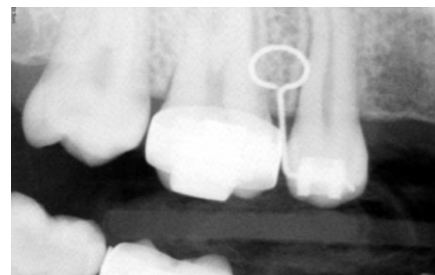


Figure 3: RVG with a parallax technique (XV3) to confirm the correct positioning of the Jig

adjacent bracket.(Figure 1) Horizontally extending leg of the jig is ligated into the second premolar bracket slot with elastomeric module. (Figure 2)

3. Take a Radiovisiography with a parallax technique (XV3) to confirm the correct positioning of the helix for miniscrew insertion. If necessary, slide the horizontal legs of the jig within the bracket slot such that the jig could be relocated to make a new radiographic exposure.(Figure 3)
4. Once the final position of the helix is confirmed, the miniscrew is inserted through the helix of the jig in the desired direction. Take Radiovisiography even after insertion of the miniscrew to check the final position.(Figure 4)
5. The jig is disengaged after 3/4th of the miniscrew is driven and then the mini-screw is completely inserted.(Figure 5)

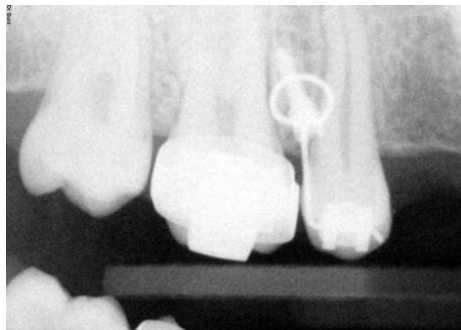


Figure 4: RVG with a parallax technique (XV3) after miniscrew placement



Figure 5: Miniscrew after insertion

Advantages

This wire jig is simple in design, easy to fabricate, inexpensive and can be used with a variety of mini-screws. This jig can also be used for placement of miniscrew in anterior inter- radicular region.

Conclusion

This simple method will help clinicians place mini-implants with greater precision thereby reduces the risk of periodontal damage to the adjacent teeth and implant failure as well as save operator- patient time.

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