

“SHAR” Grid: A Two Dimensional Customized Mini-Implant Placement Jig

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ABSTRACT

Background: Anchorage is the prime concern of an orthodontist during en-masse retraction of anterior. Anchorage loss may affect the desirable reduction of facial convexity. That's why so many intraoral and extraoral appliances/auxiliaries are used to enhance the anchorage value like trans palatal arch (TPA), Nance palatal arch, lingual arch, anchor bend, TAD, headgear etc. Mini-implant or TAD is one of the valuable tools which helps us to solve this problem. Inter-radicular mini-implant placement is generally affected by inappropriate site selection for mini-implant placement. “SHAR” is a two-dimensional customized grid which helps the clinician inaccurate placement of inter-radicular mini-implant. “SHAR” grid is a two-dimensional jig. Therefore, it provides vertical as well as a horizontal range for the placement of mini-implants.

Keywords: Anchorage, Customized, Inter-radicular mini-implant, SHAR grid, TAD.

INTRODUCTION

Now a day's Temporary anchorage devices (TADS) are prevalent in orthodontics as a reliable anchorage device¹. Mini-implant has various clinical uses and advantage over conventional anchorage devices. The wide varieties of shapes and sizes in mini-implant make it a much more useful tool². Easy insertion and removal of mini-implant help the clinician to immediately apply force³. Accurate site selection during mini-implant placement is a prime concern due to the risk of dental root damage and injury to periodontal space, which further may lead to mini-implant failure⁴. Radiographic and clinical evaluation of the planned site helps to decrease such chances of mini-implant failure^{5, 6}. The abbreviation “SHAR” stands for **SH**ashank, **A**shish and **R**ahul.

“SHAR” mini-implant placement grid mentioned in this article has a simple two-dimensional customized design which helps the clinician to place

a mini-implant in an accurately planned inter-radicular site without any dental roots injury.

Design & Fabrication

“SHAR” mini-implant placement jig has a grid design which provides two-dimensional ranges for placement of inter-radicular mini-implant. It is a customized jig, therefore, allowing the clinician to change its dimensions on vertical and horizontal plane depending on the depth of the vestibule and planned site of the mini-implant. (Figures 1)

The “SHAR” grid can be fabricated by using 0.018” or 0.017”x 0.025” or 0.019”x 0.025” stainless steel (SS) straight wire. In this article, we used 0.017” x 0.025” SS straight wire for its fabrication (Figures 1 & figure 2). A 15 cm 0.017”x 0.025” SS straight wire was taken and a 90° bend is formed after 3 cm. Extend this arm till 1.2 cm and make a U loop (2-3 mm width) and extend its vertical arm up to 1.2 cm.

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Repeat the procedure until you get the desired width of the grid then follow the steps mentioned in figure 2.

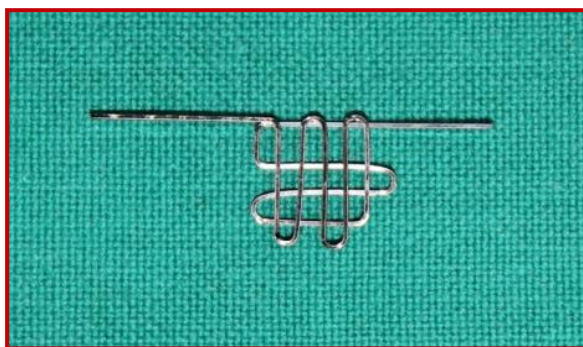


Fig 1: "SHAR" grid

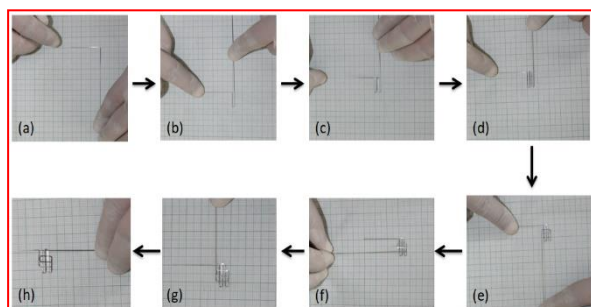


Fig 2: Fabrication of "SHAR" grid.

Finally, we get a "SHAR" grid (figure 1) of the desired dimension which is ready to use on a patient for identifying the accurate inter-radicular site for mini-implant placement.

Clinical procedure

"SHAR" grid should be placed into the bracket slot between two adjacent teeth where we want the mini-implant placement. "SHAR" grid should be stabilized in its desired position by the elastomeric module. After placement of "SHAR" grid, an IOPAR should be taken to evaluate the proper site for placement of inter-radicular mini-implant. By comparing the grid clinically and in the IOPAR, the most favourable position for the mini-implant can be acquired. This can be done by identifying a suitable grid block in the IOPAR, followed by recognizing the same grid block in the patient's mouth. On identification of a suitable "SHAR" grid block, the local area is anesthetized before a punch mark should be made with the help of sterilized probe (Figure 3). Remove the "SHAR" grid from the bracket slot and place the mini-implant over the

marked site. After placement of mini-implant on the desired site, an IOPAR should be taken to check the accurate placement of the implant.



Fig 3: Clinical application of "SHAR" grid.

DISCUSSION

With the introduction of mini-implant in clinical practice, various clinician started discussing & finding better, accurate and easy placement in required site. Suma T⁷ et al. in 2010 invented a simple wire guide for implant placement comprise of a single helix having fixed height from the alveolar crest. The major disadvantage of this kind of placement guide was its repositioning. Hemanth et al⁸ in 2012 introduced multi-loop wire guide constituting 3-5 loops in the vertical direction. This guide also exhibited the same problem during the mesiodistal repositioning. Freudenthaler and associates⁹ added radiographic template by using acrylic and 0.018inch SS wire with a drawback in lack of precision and patient discomfort owing due to its large size. Mahmoud Al-Sueiman et al¹⁰ in 2011 introduced 3D placement guide is having horizontal and vertical control over placement but it required more manual dexterity and increased time consumption. Many more techniques like Stereolithographic surgical template, CBCT and 3D prototyping were introduced by various authors providing precise placement but at the expense of money and time¹¹.

By comparing all the previous mini-implant placement guides and templates, "SHAR" grid has many advantages as in 2-D control, mesh-like appearance compensating the repositioning error, cost-effective as it requires very less armamentarium, excellent patient acceptance and may be used in different patients after sterilization.

CONCLUSION

SHAR grid is an inexpensive and two-dimensional customized jig which provides vertical and

horizontal range to the clinician for accurate placement of inter-radicular mini-implant. SHAR grid is easy to fabricate at chairside without any specific instrument.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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