

Orthodontic Mini-implant: An Endodontic Post!!

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ABSTRACT

Background: Orthodontic Mini-implants which are also known as Temporary Anchorage Devices (TADs) are small titanium bone screws which are placed in the bone to achieve desired tooth movements with maximum anchorage. This article is intended to discuss the technique for fabrication of an endodontic post for maxillary central incisor with an orthodontic mini-implant.

Keywords: Orthodontic Mini Implant use, Endodontic post, Micro implant.

INTRODUCTION

Anchorage has long been a challenge since the introduction of fixed appliances in orthodontics.¹ Kanomi proposed titanium mini-implants (1.2 mm in diameter and 6.0 mm in length) for orthodontic anchorage.² With the advent of mini-implants, maximum anchorage has become possible and unwanted side effects have been reduced to a minimum. Biomaterials may be used for temporary purposes in the body, like coverscrews for dental implants, wires or fracture fixation plates³. The mini-implants are included in this category, as they are removed once they are of no further assistance in the orthodontic treatment. After removal of temporary devices, the recovered devices are usually discarded. However, monetary factors have caused some clinicians to re-use implants or other medical devices that are meant to be throwaway like pacemakers, intra-aortic balloons, haemodialysis membranes, coronary angioplasty catheters and orthodontic brackets and wires.³⁻⁵ In case of re-use, it is mandatory to ensure the sterility and mechanical qualities of the device.⁶ Not all implants can be re-used, but metal implants, like those made from titanium may be more amenable

to re-use because they can be mechanically and chemically cleaned and re-sterilized with potentially little or no loss of form or function³ Here, we describe a non orthodontic use of a mini implant for the fabrication of an endodontic post for central incisor.

Technique

The removal of orthodontic mini-implant (Figure 1) is done (without anesthesia) by twisting it in the direction opposite to that of insertion. It is recommended to note the type of orthodontic implant thread used (right or left) to prevent fracture during removal. The removal torque should always be less than the insertion one⁷. An efficient cleaning and sterilization process has to precede bone screw reuse to avoid contamination and infection. The purpose of cleaning is to remove or reduce visible smears including blood, protein, and debris that were precipitated on the screw surface. Mechanical cleaning with sandblasting and autoclave sterilization protocols are followed. It has been demonstrated that autoclave sterilization does not influence mechanical resistance, fracture risk, and primary stability of bone screws.⁸⁻⁹ The prosthetic treatment of seriously damaged,

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Fig 1: Used Orthodontic Mini-implant.

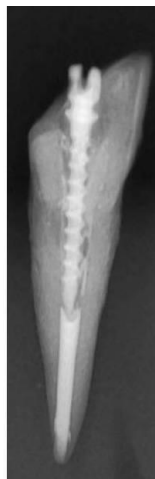


Fig 4: Mini-implant placed as endodontic post.



Fig 2: Root canal treated maxillary central incisor.



Fig 5: Mini-implant luted into the canal.

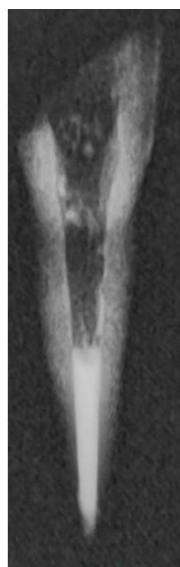


Fig 3: Gutta percha removed for reception of post.

endodontically treated teeth often require an endodontic post as an additional retention element for core build up prior to crown restoration. The commonly used dimensions of an orthodontic mini implant (6 mm long, 1.2 mm in diameter) are suitable for endodontic post for maxillary central incisors and other teeth having large root canal diameters. These mini-implants are a type of tapered, self-threaded posts. A frequently used and clinically appropriate guideline for post diameter is not to exceed one third of the root diameter.¹⁰

A study of 700 teeth recommended that post diameter should range from 0.7 mm in mandibular incisors to a maximum of 1.7 mm for maxillary central incisors.¹¹ In the present innovation, tooth to be restored (Figure 2) with a post, the gutta-percha was removed (Figure 3) with Gates Glidden drill for a length of 7-8 mm, leaving at least 4 mm of intact apical seal. The above mentioned mini-implant was chosen and it was tried-in and consequently shortened with a diamond bur. Dual Cure adhesive system was used for luting (Figure 4-5) as per manufacturer's instructions. The abutment portion was built up using high strength restorative composite. Subsequently, porcelain crowns may be fabricated as desired.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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