

Canine extrusion with a vertical tube supported cantilever spring

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Abstract

Maxillary canine is the most frequently impacted tooth in the dental arch and twice common in females than in males. Treatment of impacted maxillary canine can be difficult and time consuming, depending on its position. Improper direction and magnitude of applied force can lead to increased chances of adjacent tooth resorption. This article describes about a simple cantilever spring that can be fabricated at chair side for extrusion of a buccally impacted canine.

Key words: Canine extrusion, cantilever spring, vertical tube

INTRODUCTION

A buccally impacted canine is most commonly encountered and is usually positioned near the root of an adjacent tooth and mesial to its normal position [Figure 1].^[1] One of the challenges of such vertical tooth movement is prevention of unwanted side effects on the molar.

Cantilever springs are simple and efficient orthodontic appliances, with a wide variety of clinical uses. Biomechanically, cantilevers are able to produce statically determinant force systems, giving the clinician the opportunity to deliver qualitatively and quantitatively precise forces.^[2] A cantilever spring consists of 2 arms, the fixed and free end. The fixed end is inserted into a bracket or a tube, and the free end applies a point contact and does not engage a bracket slot or tube.

A 0.019" × 0.025" stainless steel archwire was placed in the maxillary arch, and a vertical tube was soldered to it between the premolars [Figure 2]. A 0.017" × 0.025" titanium-molybdenum



Figure 1: Pretreatment intraoral left lateral photograph

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alloy cantilever spring of 3 mm helix was fabricated with two arms [Figure 3]. The vertical arm, i.e., the fixed end of cantilever spring, was inserted into the soldered vertical tube and cinched [Figure 4], and the horizontal arm which is at 90° to the vertical arm was activated to in the incisal direction by closing

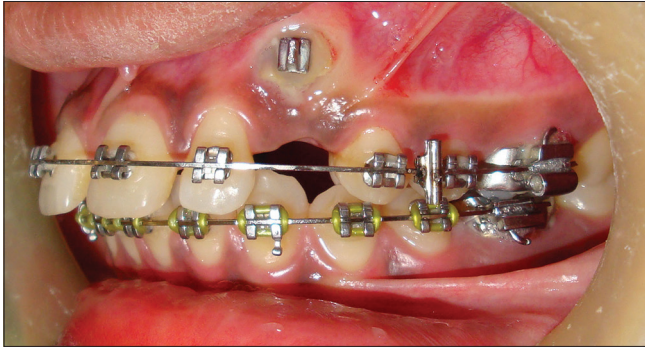


Figure 2: 0.019" × 0.025" Stainless steel wire with soldered vertical tube

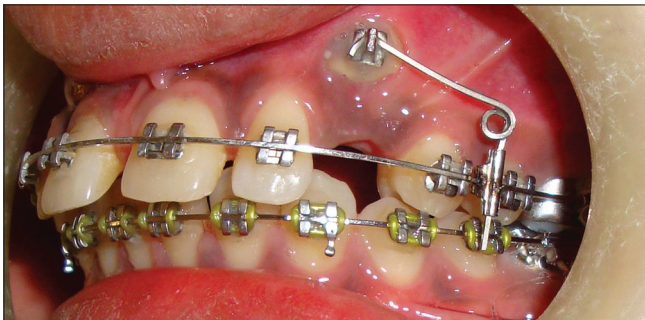


Figure 4: Cantilever spring activation for canine extrusion

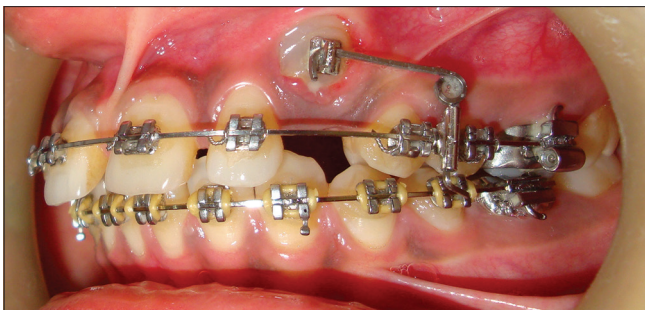


Figure 6: Progress of canine extrusion over 2 months

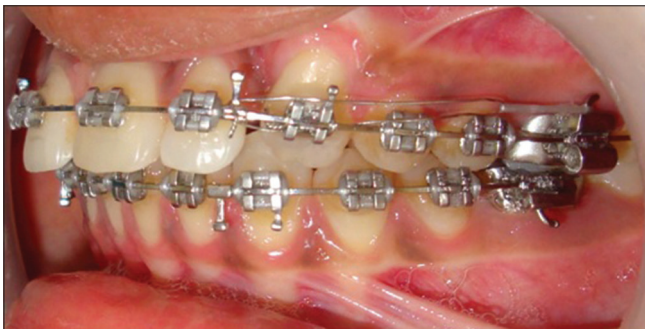


Figure 8: Space closure with stainless steel base archwire after canine alignment

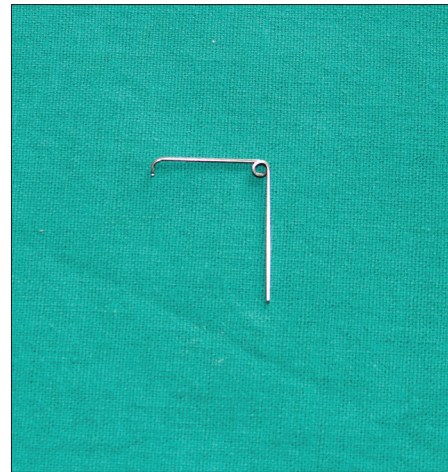


Figure 3: 0.017" × 0.025" Titanium-molybdenum alloy cantilever spring (passive)

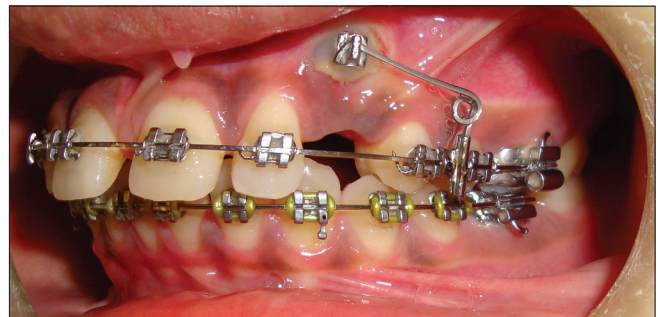


Figure 5: The vertical arm of the cantilever spring cinched

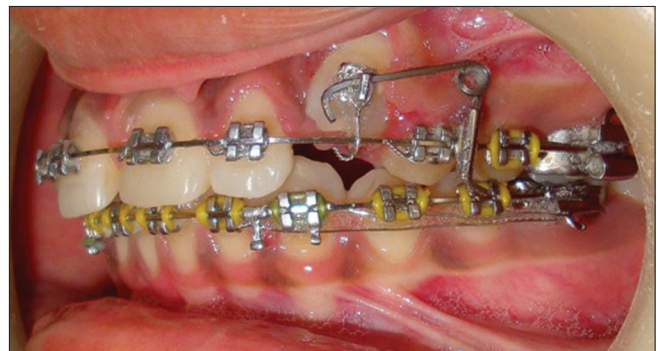


Figure 7: Canine extrusion after 6 months of cantilever mechanics



Figure 9: Posttreatment intraoral left lateral photograph

the helix and forcefully engaging into the bracket bonded on the impacted canine [Figures 4 and 5]. This cantilever spring exerted 50 g of force for canine extrusion as measured with a force gauge [Figures 6 and 7].

This spring was shown to be an effective means of aligning buccally impacted maxillary canines [Figures 4 and 5]. Final alignment and leveling of canine was performed using 0.019" × 0.025" stainless steel wire. The residual space closure was done using active tie backs [Figure 8]. Post treatment intraoral photograph showing well aligned maxillary canine in the arch [Figure 9].

This spring can be easily fabricated and activated at chair side for extrusion of a single tooth to avoid the unwanted

effects on the molar and can also be used when an auxiliary molar tube is not available.

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Conflicts of interest

There are no conflicts of interest.

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