

Clinical Case Report

Creation of a post-and-core in a fractured mandibular premolar directly at the clinic

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We report the clinical case of a female patient 52 old who presented for consultation because of a horizontal fracture of the mandibular left first premolar. The existing metal-ceramic restoration on this tooth had been fitted with an extracoronal attachment and, in conjunction with another attachment at tooth 43, retained a removable partial denture.

A clinical and radiographic examination was performed during the first session. The periodontal ligament was dilated as a result of occlusal parafunction. After developing a treatment plan, endodontic treatment was performed in accordance with this plan. The root canal was prepared using rotary instruments and obturated with Thermafil[®] (Figure 1).



(Figure 1).

The process of planning and executing conservative treatment was continued in the next session, having verified that the result of endodontic treatment was as predicted. Given the considerable loss of coronal tissue, and once we had ascertained that > 1 mm of residual tooth structure could be expected (ferrule), we decided to employ a retentive element. In this specific case, a fiber post was considered preferable. The Core & Post System[®] for post insertion and core reconstruction was used. A presentation of the treatment steps follows:

- The operative field was isolated with rubber dam (Figure 2).



(Figure 2).

- A round tungsten bur was used at low speed to remove the temporary obturation.
- The length of the prospective post was determined based on the endodontic working length and visualizing how much of the root was supported by bone. A Largo[®] Peeso reamer No. 1 was used at a maximum speed of 1200 rpm to remove the gutta-percha and the Thermafil plastic rod. The gutta-percha exit point was used as a first indication that we were proceeding in the right direction. No apically oriented pressure should be applied on meeting obstacles. With the contra-angle handpiece at rest and the cutter inside the canal, the orientation of least resistance was explored, indicating that the point above the gutta-percha and hence the right direction had been reached. The safest method to find out whether the correct position has been reached was by obtaining a periapical radiograph with the cutter inserted in the canal (Figure 3).

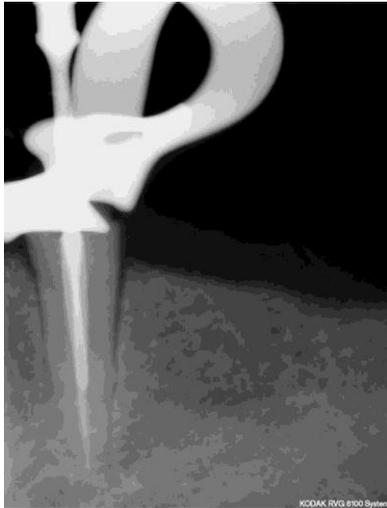


(Figure 3).

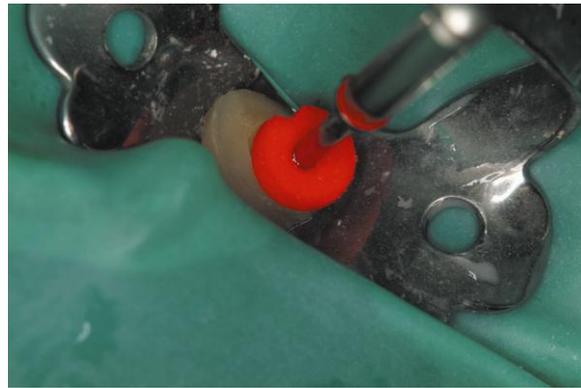
The same radiograph allowed us to evaluate whether we had attained the projected length at least halfway into the bone-supported root. To avoid compromising the apical seal, it is

mandatory to always leave a minimum of 4 mm of gutta-percha. We also visualized the mesiodistal space occupied by the cutter, which indicated how thick the post should be and what size Thermafil point should be used).

- A rubber tip placed into the Easy Post bur and advanced to the predetermined length (Figs. 4 and 5). Back-and-forth movements should be avoided, as these would cause excessive dilatation and prevent tight accommodation of the future post.



(Figure 4)



(Figure 5)

- We inserted the selected X-Post into the root and marked the height of the future core, which should be one-third of the final length of the post (Figure 6). Upon removal from the patient's mouth, the post was reduced in length with a diamond disk and cleaned with alcohol.



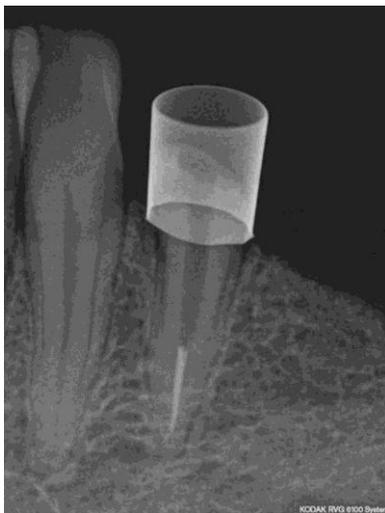
(Figure 6)

- To retrieve any residual material from the canal, a fine brush was introduced using the contra-angle handpiece at low speed (Figure 7).



(Figure 7)

- A copper sleeve was used as matrix for designing the core. Its diameter was selected such that a close fit around the tooth was obtained. The sleeve should remain stable in place simply by applying vertical pressure without heating (a cotton roll was used for protection). A sealed compartment was obtained in this way. Gingival bleeding was provoked to verify that this would not contaminate the preparation (Figures 8 and 9).



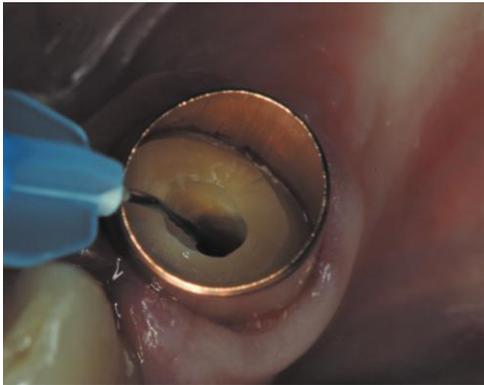
(Figure 8)



(Figure 9)

- The canal and the tooth surface were etched with 36% phosphoric acid for 15 seconds (Figure 10). After rinsing with a copious amount of water, a paper point was used in the canal and aspiration in the core to avoid dehydration of the dentine. Small amounts of XP Bond and Self Cure Activator were mixed to ensure that chemical polymerization would take place in the most apical zone of the preparation (Figure 11). The entire adhesive surface was impregnated and allowed to rest for 20 seconds (Figure 12). The post was also wetted with this mixture. A paper point was introduced into the canal to avoid

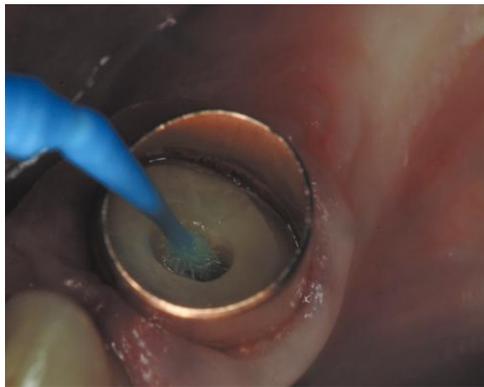
formation of any pools of adhesive that would change the length of the working path (Figure 13). A jet of air was used to eliminate the solvent.



(Figure 10)



(Figure 11)

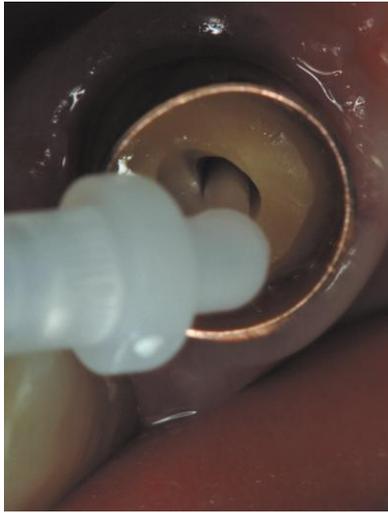


(Figure 12)

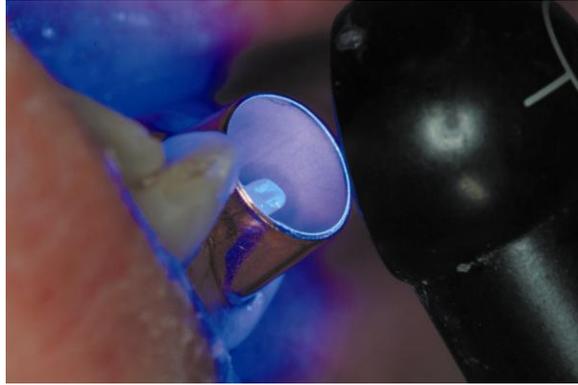


(Figure 13)

- Core Xflow was deposited directly into the canal through the fine cannula located at the end of the mixing point (Figure 14). It is essential to avoid air inclusions by taking the application point in a gliding movement from the apex toward the coronal surface. The post was immediately inserted and polymerized for 20 seconds (Figure 15). The copper sleeve was filled with the same material, followed by light curing but also allowing for 3 minutes of self-curing (Figure 16).



(Figure 14)

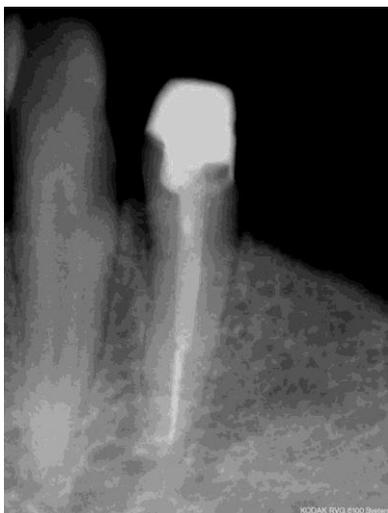


(Figure 15)



(Figure 16)

- The copper sleeve was removed by using a cutter vertically along its entire length. Finally the core was trimmed, making sure that a clean ring of supragingival tooth structure 2 mm in height was present that (Figures 17 and 18). This surface was needed to safely retain the crown restoration to be delivered in the next phase of treatment.



(Figure 17)



(Figure 18)