Safe and Easy Way to Use Calcium Hydroxide as a Temporary Dressing

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Calcium hydroxide is used for several clinical applications in endodontic therapy (1, 2). The majority of studies that used this substance, in order to show its biological properties, were done with the pure calcium hydroxide (3-5). The results of these studies are excellent (Fig. 1) but the physicochemical properties of pure calcium hydroxide offers some disadvantages. It is radiolucent, permeable to fluids, highly soluble in the periapical region, and without viscosity, adherence, or flow. Moreover, this substance is not easy to apply into the root canal. Thus, in order to obtain a calcium hydroxide product with better clinical properties Leonardo (6), Silva (7), and Bonetti Filho (8) have analyzed, both in vitro and in vivo, 13 different formulations of this substance.

The best results (Fig. 2) among these formulations were reached using the following paste: 2.5 g of calcium hydroxide p.a., 0.5 g of zinc oxide p.a., 0.05 g of hydrogenized colophony, and 1.75 ml of polyethylene glycol 400. The polyethylene glycol 400 is a clear, colorless, slightly hygroscopic, viscous vehicle that allows a slower release of hydroxyls and Ca²⁺ ions than aqueous vehicles (9). This paste is packed in sterile anesthesia cartridges (Calen; S. S. White-Artigos Dentários Ltda., Rio de Janeiro, Brazil) and dispensed in a special cartridge-type syringe (ML Endodontic Syringe; S. S. White-Artigos Dentários Ltda.). Using any disposable dental needles, 27-gauge long, this calcium hydroxide paste will flow well and can be easily placed into the root canal.

**MATERIALS AND METHODS**

The following materials were used: calcium hydroxide paste cartridges, (Calen; S. S. White-Artigos Dentários Ltda.), special cartridge-type syringes (ML Endodontic Syringe; S. S White-Artigos Dentários Ltda.), sterile glycerin stored in sterile anesthetic cartridges, and disposable 27-gauge dental needle.

Place the disposable dental needle with rubber stop marking the working length in the ML Endodontic Syringe. In order to obtain easier access to the root canal the needle must be bent. The lumen of the needle should be lubricated with sterile glycerin in order to allow easy flow of the paste. The glycerin cartridge is removed and the calcium hydroxide paste cartridge is placed into the ML Endodontic Syringe. When the screw handle is twisted, the paste will be extruded easily through the needle. The needle must be placed deeply into the root canal. The paste is extruded gradually as the needle is slowly backed from it (Fig. 3). After each application the calcium hydroxide cartridge must be carefully cleaned and stored until next use. The temporary restoration must be efficient in order to avoid leakage which could cause secondary contamination of the root canal.

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FIG 2. Mesial root of lower second premolar of dog. Intentional perforation of the apex was done with files up to #30 and the canal filled with a plug of calcium hydroxide (arrow). The rest of the canal is filled with gutta-percha points and Proco-Sol. Cementum-like apposition has occurred in the canal wall (C) 6 months after treatment (hematoxylin and eosin stain; original magnification x40).

References


FIG 3. A, Maxillary right central incisor. The calcium hydroxide (Calen) as a temporary dressing is applied gradually into the root canal as the needle is slowly backed out. B, Periapical radiograph of the same tooth showing the temporary dressing in the root canal.


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Zachariah Yeomans