Filling Root Canal Systems with Centered Condensation

Concepts, Instruments, and Techniques

Filling root canals seems to be the primary obsession of dentists providing endodontic therapy to their patients. This is because we (especially endodontists) are judged as clinicians by how ideal the fill looks after the case is finished. But the more fundamental cause of this focus is the common frustration dentists experience during the obturation procedure itself.

L. STEPHEN BUCHANAN, DDS, FICD, FACD/SANTA BARBARA, KALIFORNIEN

Ironically, problems encountered during filling procedures are most often not about obturation but are related to missteps during negotiation and shaping procedures.[1] If you never get to the end of a root canal during the negotiation phase of treatment, you will never shape or fill to that point afterward. When curved canals are blocked, ledged, or prematurely obturated by separated instruments, it is impossible to enjoy the fill unless you state that you meant to do that—that you like filling short apically. Fortunately, our concepts, instruments, and techniques for the preparation of primary canals prior to obturation have never been so accessible to dentists having a wide range of talent and experience. With the use of patency clearing and lubricants during negotiation, apex locators for length determination, and variably-tapered nickel titanium files for shaping, ideal root canal preparations can be accomplished by novice dentists in nearly every case, thereby eliminating most of the frustrations inherent to obturating primary canals to any desired endpoint.[2]

Apical Extent of Filling

So now that root canal preparation is more a science than an art, how do we decide the ideal endpoint for filling? The best research I've read in answer to this question was done by SJOGREN, FIGDOR, PERSSON, and SUNDQVIST,[3] who looked at root canals filled short and long, with positive

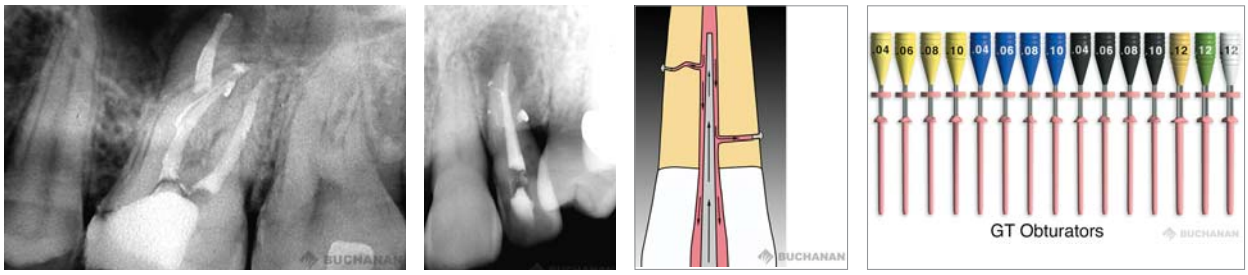

Fig. 1: Maxillary molar with MB2 canal bifurcating off the MB1 canal and extending 7 mm's further before bifurcating again and exiting on the root surface. This side canal was non-negotiable and therefore most likely not sterile before obturation. Fortunately a bolus of sealer and warm gutta percha was rolled through its full length, entombing any remaining bacteria and allowing a success in spite of severe anatomic challenges. – Fig. 2: Maxillary lateral incisor with wild anatomy, all of it filled in a single Continuous Wave downpacking movement (2.5-seconds). – Fig. 3: Schematic diagram of the streaming effect created as the condensation device is driven through the center of the filling material. – Fig. 4: GT Obturators sized to match the GT file shapes.

Fig. 5: GT Obturator, showing gutta percha cut back from its tip, as it starts down the canal. – Fig. 6: GT Obturator further into canal showing gutta percha moving toward its tip as it pushes though the narrowing canal space. – Fig. 7: GT Obturator as gutta percha moves even with the carrier tip, Note the side canal beginning to be filled. – Fig. 8: GT Obturator in its ideal final position 1 mm short of the canal terminus showing the typical sealer and gutta percha front extending to full length with a small puff of sealer. Note the fill in the lateral ramification.