

The Access Box: An Ah-Ha Phenomenon

Henry J. Rankow, DDS and Paul R. Krasner, DDS

Proper access is the basis for all endodontic therapy. This article highlights a teaching tool that powerfully demonstrates to all students and dentists the concept of proper access.

The endodontic triad consisting of biomechanical preparation, microbial control, and complete obturation of the canal space remains the basis of endodontic therapy (1-3). However, unless access to the canal orifices and the apex is done properly, achieving the goals of the triad will be difficult and time consuming. Adequate access is the key to creating an environment in which the body can heal itself.

Because this notion of proper endodontic access is so important, it is critical that every student grasp the concept in its entirety. Unfortunately, this concept is usually difficult for the student to master. Part of this difficulty undoubtedly lies in the tendency of most students (as well as dentists) to put the cart before the horse and search for orifices before the entire roof is removed. They assume that when orifices are located, this part of the access task has been completed and they no longer need to enlarge the access and fully visualize the chamber floor. Invariably, this results in inadequate removal of the pulp chamber roof and the consequent inability to see the entire pulp chamber floor (Fig. 1).

Unfortunately, the student is often instructed during the undergraduate years that removal of tooth structure is essentially bad. It then becomes very difficult for these same students to gather the resolve needed to remove enough tooth structure to reveal the floor wall junction. The student mistakes the divergent (though really parallel) appearance of the walls of a properly finished access with overpreparation, as they have been taught that "unnecessary tooth removal may compromise the final restoration" (4). The student does not usually realize the underlying principle of Black (1, 5) and others that sufficient tooth structure must be removed in order to eliminate the disease process and generate the best opportunity for success. The student is inexperienced and therefore unable to decide what is and is not "unnecessary." Thinking they are adhering to accepted doctrine, the student inappropriately places too much emphasis on the conservation of tooth structure theory, a practice that is difficult to break. The enamel rod becomes sacrosanct. In reality, the theory becomes a rationalization for ceasing the cutting of tooth structure so that the fear of perforation or castigation for too much enamel removal is allayed.

This reluctance to remove sufficient tooth structure is reinforced by the student's inaccurate mental picture of how the final com-

plete access should look. Most textbooks simply recommend the complete removal of the roof, but offer no guidelines or landmarks to indicate when precisely access becomes adequate. Adequate access, indeed, demands complete removal of the roof and all dentin and enamel obstructions. The only way an operator can be sure that the roof is completely removed is when he/she can see all of the walls of the chamber meet the floor of the chamber 360 degrees around. If any part of the roof is remaining, then the wall in that area is obscured. If the operator cannot see the wall meet the floor, then there exists the possibility of a hidden orifice lying beneath an overhang. (Fig. 2, arrow). The challenge then emerges



FIG 1. Chamber roof not completely removed. Access compromised.

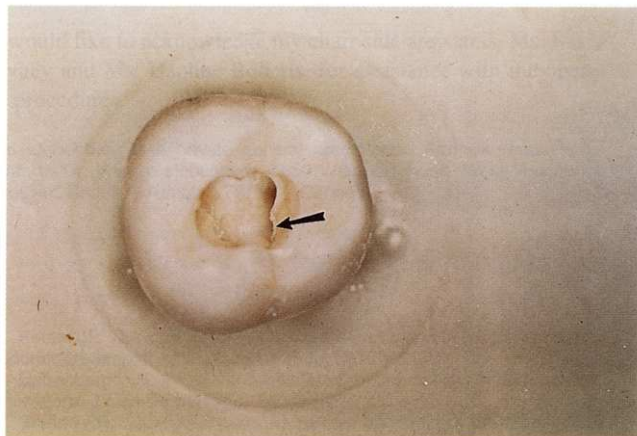


FIG 2. Hidden orifice obscured by an overhang.

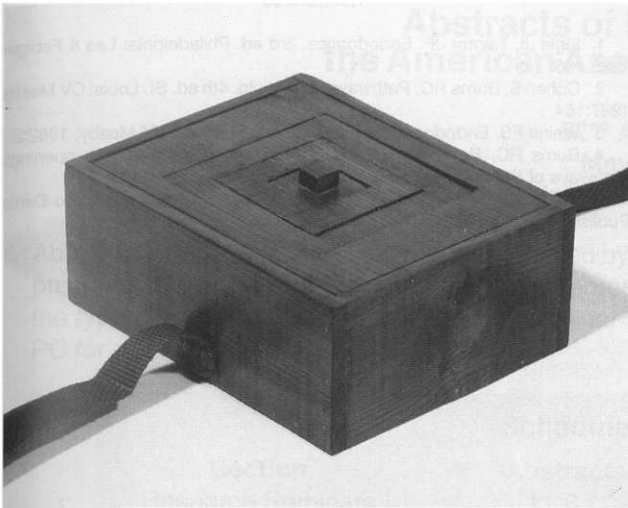


FIG 3. The intact "access box."

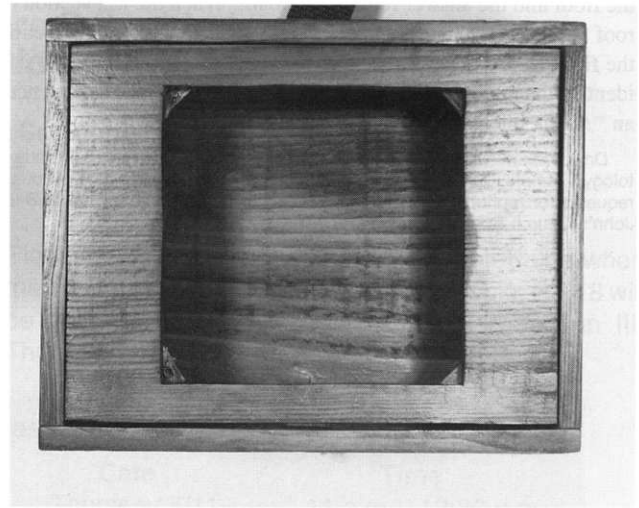


FIG 6. Although 90% of "roof" is removed, access is still inadequate.

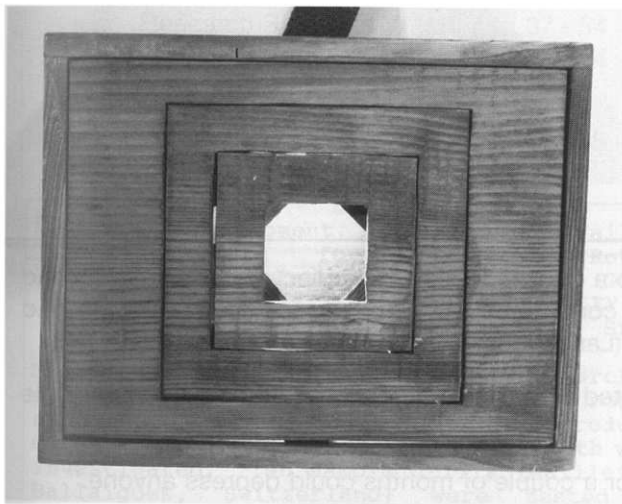


FIG 4. Partial access.

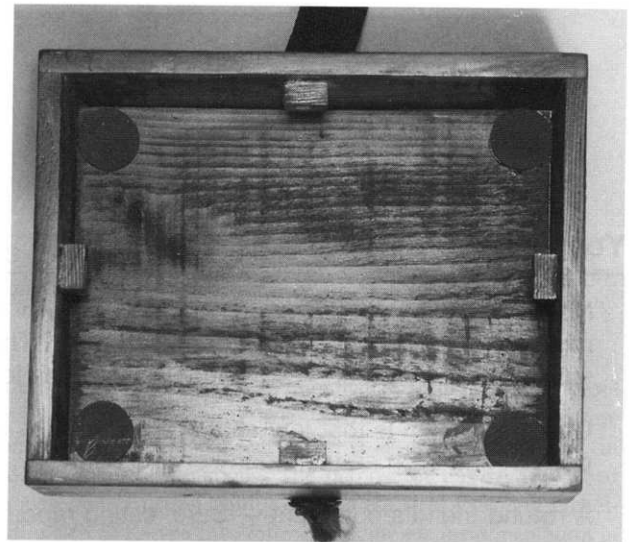


FIG 7. Total roof removal. Visualization of the orifices usually engenders "Ah-ha" from the student.

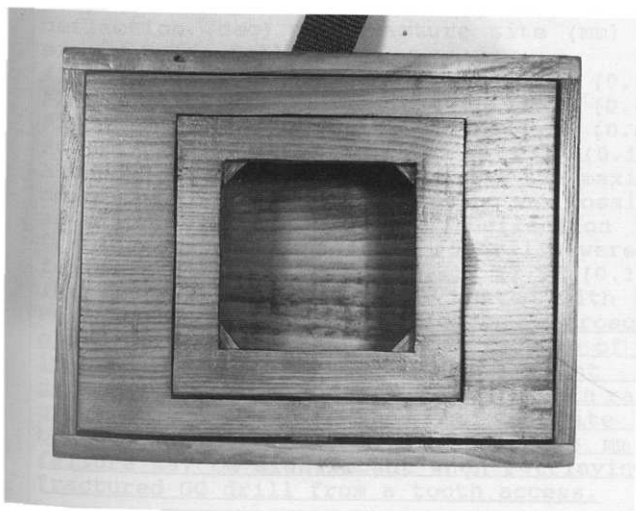


FIG 5. Additional "roof" removal.

to develop a dramatic and unforgettable means of showing the value of complete tooth structure removal, thereby demonstrating how a narrow and seemingly insignificant ledge of remaining roof can prevent observation of the orifice.

THE ACCESS BOX

Using current concepts of adequate access, we developed a box that would show clearly and powerfully the advantages and disadvantages of complete roof removal. The box represents the pulp chamber (Fig. 3). The walls of the box are at right angles to the floor and parallel with each other. The top of the box (roof) was created in a series of steps to show various stages of inadequate roof removal. The roof is removed in a series of steps that reveal sequentially more of the underlying floor (Figs. 4 and 5). At each step, the student is asked to identify the number of orifices present on the floor of the box. Even with 90% of the roof removed as is seen in Fig. 6, the student cannot fully visualize the walls meeting

the floor and the answer remains in doubt. When the last section of roof is removed (Fig. 7) and the student can see the walls meeting the floor for 360 degrees, as well as note how effortlessly one can identify the number and position of the orifices, he/she experiences an "Ah-ha phenomenon."

Drs. Rankow and Krasner are members of the Department of Endodontology, Temple University, School of Dentistry, Philadelphia, PA. Address requests for reprints to Dr. Henry Rankow, Endodontic Associates, 395 St. John's Church Road, Camp Hill, PA 17011.

References

1. Ingle JI, Taintor JF. Endodontics. 3rd ed. Philadelphia: Lea & Febiger, 1985:166.
2. Cohen S, Burns RC. Pathways of the pulp. 4th ed. St. Louis: CV Mosby, 1987:154.
3. Weine FS. Endodontic therapy. 4th ed. St. Louis: CV Mosby, 1982:2.
4. Burns RC, Buchanan LS. Tooth morphology and access openings. Pathways of the pulp. 5th ed. St. Louis: CV Mosby, 1991:112.
5. Black GV. Operative dentistry. Vol. II, 7th ed. Chicago: Medico-Dental Publishing Co., 1936:137.

You Might Be Interested

Now here's a poser. Lowering serum cholesterol leads to a clear reduction in cardiac related morbidity and mortality but total mortality is unaffected. Why? There is a corresponding increase in accidents, violence, and suicide in study groups whose cholesterol was lowered (Lancet 337:1529).

One suggestion is that low serum cholesterol is associated with clinical depression at least in susceptible populations such as the elderly or unemployed.

A rotund friend's comment—"Sure, eating rabbit food for a couple of months could depress anyone."

A. V. Dupois