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The Research Institute of the National Dental Association

All Communications for this Department Should be Addressed to the President
and (Acting) Managing Director, Weston A. Price, M. S., D. D. S., Research
Institute of the National Dental Association, Cleveland, Ohio.

SOME ROOT CANAL PROBLEMS.

By J. R. Callahan, D. D. S., Cincinnati, Ohio.

(A Partial Report of the Researches conducted under the auspices of the Dental Laboratory of the Pathologic Institute of the Cincinnati General Hospital and the Research Institute of the National Dental Association.)

HAVING on many occasions given in detail a technic for the filling of root canals that is somewhat at variance with the accepted methods, we desire now to throw some further light upon the underlying anatomic reasons for the technic referred to.

If root canals were straight from pulp chamber to apex and approximately round, of gradually increasing diameter from apex to floor of pulp chamber, the filling of such a canal would be an exceedingly simple matter. Pushing or packing warm gutta percha after the introduction of a gutta percha solvent in sufficient amount to smear the walls of the canal meets the requirements.

A very small portion of root canals are of the outlines mentioned. As is well known to dentists most canals are thin flat channels following a devious course thru a tubular substance, the dentine,

finally, in apical third of roots, they break up into two or more fine branching canals leading to—from one to nine foramina.

We believe that to fill or seal the dentinal tubuli, the collateral or branching canals are of equal importance as the filling of the main root canal.

Experimental work shows that direct packing of the filling material into the canal does not cause it to enter the tubuli, nor does the filling enter the smaller of the branching canals under direct pressure. The pumping motion so often described does send the filling solution into both tubuli and collateral canals.

The root canals and the dentinal tubuli are quite well understood by the profession at large, but the collateral canals are not so well known. The principal purpose of this report is to give a com-

prehensive illustration of the minute anatomy of root canals in the apical third of 75% of adult tooth roots.

to fill a root canal and all the accessory canals or spaces with a substance that is not, at the time of its introduction into

Figure 1.

Figure 3.

The illustrations that are presented are photo-micrographs, two inch ocular,

the canals in a thin state,—a very thin fluid state.

Figure 2.

Figure 4.

two inch objective, of stained pulp tissue within the pulp canals.

These illustrations prove conclusively two points,—First, it is impossible to cleanse a pulp canal by mechanical means alone. Second,—It is not possible

Figure 1 shows a very common condition found in distal roots of inferior molars. The canal near the apical end of the root turns sharply either buccally or lingually. Attention is called to the fact that nearly all collateral canals extend

from the main root canals in a buccal or lingual direction. Seldom do they extend in a mesial or distal direction. It is

pid from a young person. Note the large apical foramen. It may be well for certain histologists to study this case.

Figure 5.

therefore a difficult matter to get them to show in a radiogram.

Figure 2 is a distal root of an inferior

Figure 7.

Figure 4 is the root of a second superior bicuspid showing a rather picturesque distribution of delta of pulp tissue.

Figure 6.

molar. The collateral canal branches off from the main pulp canal much farther crownward than in Figure 1. There were other branches of the pulp canal in this specimen that had to be sacrificed to show the one most desired.

Figure 3 is the root of a superior cus-

Figure 8.

The extreme end of the root curves mesially, for that reason the delta shows smaller in the picture than it does in the specimen.

Figure 5 is also a root of a second superior bicuspid. This root end has at least eight foramina. They curve in

many directions, making it impossible to get them focused in one picture.

This root end suggests a legitimate question—Can all of these canals be cleansed and filled to their ends while the tooth remains in the jaw?

No two root ends are exactly alike. Root canals very much like Figure 5 have been filled, showing five and six foramina well sealed.

Figure 6 is an anterior buccal root of a superior molar and is a fair illustra-

canal is not so easy to prepare as a hurried examination might lead one to suppose.

Figure 9 is a case of unusual interest. A superior cuspid tooth, a rather large collateral canal that describes a half circle is seen to break off, mesially at a right angle from the main canal then curves distally passing thru dentine very near the cemental tissue, until a half circle is completed and then emerges distally thru a well defined foramen. As to the

Figure 9.

Figure 10.

tion of the canal distribution in 90% of these roots. This is only an estimate as far as percentage goes, still we believe it to be approximately correct. This places anterior buccal roots of superior molars in the difficult, many times impossible class.

Figure 7 is an anterior root of an inferior molar. In this case the dentinal tubuli, the pulp canals showing five foramina (one canal curves out of focus to the lingual) are filled to the end. The filling was done after the tooth had been extracted.

Figure 8 is an anterior root of an inferior molar. There is a very thin flat space uniting the two canals. This thin canal is crossed here and there by delicate cancellous tissue. This kind of a

cleansing and filling of such a canal we may be allowed to express some doubt.

Figure 10 is the apical end of the palatine root of a superior molar. Each of the three foramina in this case would be filled by any of our experts.

A much larger number of illustrations could be given and doubtless would be of interest to those who wish to give this subject close study.

It is quite probable, however, that further elaboration of the anatomical developments referred to might cause many to forget the declared purpose of this short report.

There is yet an immense amount of work in this line to be done. We regret that some one who has a vision cannot give full time to its development.