

# SOME OBSERVATIONS CORRELATED TO OBLITERATED DENTINAL TUBULES AND PERFORMED WITH MICRORADIOGRAPHIC TECHNIQUE

*by*

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In June 1955 Bergman and Engfeldt reported their findings of the dentinal tubules obliterated by mineral salts. At about the same time similar observations were made at the Histological Department of the University of Göteborg.

36 teeth from patients representing ages from 9 to 55 years were investigated. All the teeth investigated were without any carious lesions.

The teeth were ground perpendicular to the long axes of the dentinal tubules down to 20—30  $\mu$ . Microradiographic technique was applied to the material with aid of an AEG-50 Machlett tube (1 mm Be) and exposed at 5 kV and 21 mA. All the measurements were made directly on the microradiograms.

Exactly one third of the teeth investigated showed obliterated dentinal tubules. They all appeared in the crowns of the teeth. A tendency of increasing obliteration with increasing age of the patients was observed, i.e. the older patients have a higher degree of obliteration than the younger ones. Two teeth from patients of 9 and 14 years were exceptions. They both showed a very high degree of obliteration. No tendency correlated to sex was observed.

Interglobular dentin is seen at the dentino-enamel junction in all cases together with obliterated dentinal tubules.

Measurements of the shortest diameters of the completely ob-

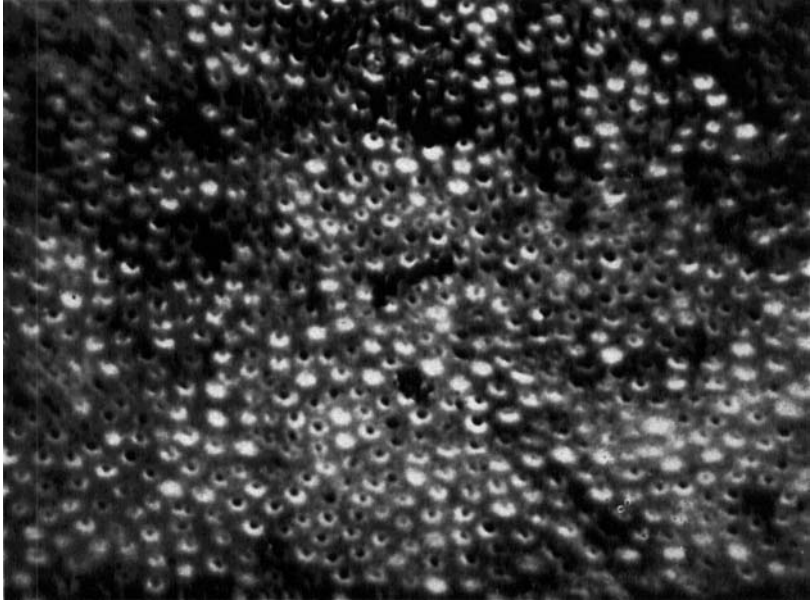


Fig. 1. Microradiogram of dentinal tubules obliterated by mineral salts. White areas represent high x-ray absorption. ♀ age 55. Section  $30 \mu$  ( $\times 400$ ).

obliterated dentinal tubules showed them to be about  $3.5 \mu$  (mean value), i.e. they are a little wider than non-obliterated tubules.

Preliminary roentgen-absorption measurements were performed with a microphotometer allowing measurements down to  $3 \mu^2$ . Using a reference system with step-like arranged Al-foils (each step  $9 \mu$  thick) it was possible to determine the absorption of the obliterated dentinal tubules and that of the intertubular substance and to report the difference in  $\mu\text{Al}$ . The mean value of the difference was found to be  $3.35 \mu\text{Al}$  (2.70—4.05).

#### SUMMARY

Dentinal tubules obliterated by mineral salts are found in *non-carious teeth*, when ground sections perpendicular to the long

Enamel

Dentin



Fig. 2. Microradiogram of the same section as Fig. 1 showing interglobular dentin in the neighbourhood of the dentino-enamel junction ( $\times 100$ ).

axes of the dentinal tubules are analyzed with a microradiographic technique.

A tendency of increasing obliteration correlated to increasing age is noticed. No correlation to sex is observed.

Interglobular dentin is seen at the dentino-enamel junction in all cases with obliterated dentinal tubules.

All the obliterated tubules are found in the crowns of the teeth.

The completely obliterated tubules are found to be about  $3.5 \mu$  wide at their shortest diameters.

Preliminary roentgen-absorption measurements in terms of  $\mu\text{Al}$  give a mean value of  $3.35 \mu\text{Al}$  for the difference between the absorption of obliterated dentinal tubules and that of the intertubular substance.

## RÉSUMÉ

QUELQUES OBSERVATIONS D'OBLITÉRATION DES CANALICULES  
DENTINAIRES, EFFECTUÉES À L'AIDE D'ANALYSES  
MICRORADIOGRAPHIQUES

Par des analyses microradiographiques de coupes perpendiculaires à l'axe des canalicules dentinaires, on trouve dans *des dents non-cariées* des canalicules dentinaires oblitérés par des sels minéraux.

Cette oblitération montre une tendance à s'accroître, en corrélation avec l'âge de la dent. On ne trouve aucune corrélation avec le sexe.

Dans tous les cas de canalicules dentinaires oblitérés, on trouve de la dentine interglobulaire à la jonction de la dentine et de l'émail.

Toutes les canalicules oblitérés se trouvent dans la couronne des dents.

Les canalicules totalement oblitérés ont un diamètre de  $3,5 \mu$  à l'endroit le plus étroit.

Une mesure préalable de l'absorption des rayons X, calculé en  $\mu\text{Al}$ , donne une différence moyenne de  $3,35 \mu\text{Al}$  entre l'absorption des canalicules dentinaires oblitérés et celle de la substance intercanaliculaire.

## ZUSAMMENFASSUNG

EINIGE BEOBACHTUNGEN ÜBER OBLITERATION DER DENTIN-  
KANÄLCHEN MITTELS MIKORADIOGRAPHISCHER  
TECHNIK

In mit Hilfe von Mikroradiographie analysierten Schleifsnitten senkrecht zur Achse der Dentinkanälchen werden in *nicht kariösen Zähnen* mit Mineralsalzen obliterierte Dentinkanälchen gefunden.

Eine Neigung zu zunehmender Obliteration bei zunehmendem Alter wird beobachtet. Geschlechtliche Unterschiede sind nicht festzustellen.

In allen Fällen mit obliterierten Dentinkanälchen wird an der Dentin-Schmelz-Grenze interglobulares Dentin wahrgenommen.

Alle obliterierten Kanälchen werden in der Zahnkrone gefunden.

Der kleinste Durchmesser der vollständig obliterierten Kanälchen beträgt  $3,5\mu$ .

Vorläufige Röntgenabsorptionsbestimmungen gemessen in  $\mu\text{Al}$  ergeben einen durchschnittlichen Unterschiedswert zwischen der Absorption der obliterierten Kanälchen und der Intertubularsubstanz von  $3,35\ \mu\text{Al}$ .

## REFERENCES

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