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"EFFECT OF AGE ON BACTERIAL PENETRATION INTO THE RADICULAR DENTIN: AN IN-VITRO SCANNING ELECTRON MICROSCOPIC STUDY."

by

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Abstract

Background and Objectives: The essential role of bacteria in the initiation, propagation and persistence of apical periodontitis has been established. The main objective in the treatment of infected root canals is the elimination of microorganisms from the root canal system, because they are the main factor in the development of persistent periapical inflammation. It was hypothesized that the increased calcification of the apical dentin in older age groups may help prevent periapical irritation, and the apical dentin in young people would have more dentinal tubules with the greater chance to harbor potentially irritating bacteria. The objective of this study is to determine the effect of age on depth of penetration of bacteria into the radicular dentin and on the number of infected radicular dentinal tubules.

Materials and methods: Fifty six extracted single rooted teeth were collected and were divided into 3 groups with 26 teeth each in young and old groups and 4 teeth in control group. GROUP 1: (n=26) Teeth of young patients with age group ranging from 18-24 years, mean age of the patient was 22 years. GROUP 2: (n=26) Teeth of old patients with age group ranging 60-77 years, mean age of the patient was 67 years. CONTROL GROUP: (n=4) 2 teeth from young patients (group 1) and 2 teeth from old patients (group 2) were used as control. The teeth were sterilized and access opening was made with size 2 endo access bur.

The root canals were instrumented with protaper till size F_2 and inoculated with a standardized bacterial load of $3x10^8$ cells/ml of Enterococcus faecalis and incubated for 20 days. The samples were prepared and observed under scanning electron microscope. Data were analyzed with unpaired t- test.

Results: A significantly greater depth of bacterial penetration into the radicular dentin was seen in the young age group compared to the older age group ($p<0.05$). Higher number of tubules invaded by bacteria in young group when compared to old group and the difference was statistically significant ($p<0.05$).

Conclusion: Age of the patient significantly influences the number of infected radicular dentinal tubules and the depth of penetration of the bacteria. Bacterial infection of dentinal tubules occurs to a greater extent in younger patients compared to older patients.

Key words: E. faecalis, age, radicular dentinal tubules, depth of penetration.