

DIGITAL RADIOGRAPHIC AND MICROSCOPIC EVALUATION OF THREE DIFFERENT SOFTENED GUTTA PERCHA OBTURATION TECHNIQUES EMPLOYING DIFFERENT HEAT SOURCES.

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ABSTRACT

The aim of this study was to evaluate and compare the three warm vertical compaction gutta percha techniques internally softened with three different heat sources. Fifteen human extracted single rooted teeth were prepared and randomly divided into three groups. In the root canal of the first group, the gutta percha was internally softened with Touch'n Heat tips. The intracanal heat source of the second group was Nd:YAG laser beam activated at 2.5 W for 15pps and 2 second for each single irradiation time. While, a flame-heat carrier was used in the third group. The gutta percha was then vertically condensed without using a sealer until complete canal obturation. To compare each obturation in form of replicate the root canal system, a split tooth model was performed and obturated ten times for each technique. Each obturation was examined under stereomicroscope. All root canals and model impressions were digital radiographed by Digora system to evaluate the quality of each obturation in terms of: extended to the working length, presence or absence of voids and canal adaptation. The ability of each technique to condense a maximum gutta percha inside the different level of root canal was also evaluated through measuring the gutta percha density at each mm of obturation as well as of surface area of each coronal, middle and apical thirds. One root canal of each group was splited and examined by scanning electron microscope. The data provided by the Digora system revealed that The Touch'n Heat softened obturation technique showed significant highest mean density values than the other techniques at all parts of the root canal. While, the lased softened obturation technique represented the least mean density at both cervical and middle thirds. Although the three tested techniques represented insignificant differences of filling homogeneity all over the working length, the Touch'n Heat group had better appearance with no or very few voids on the surface. The frequency of void appearance was exaggerated in lased obturations either in cervical or middle thirds. All obturations of the three groups showed good adapted to dentin wall, with prominent projections toward dentinal tubules in lased softened group. At the cervical third, the other two groups, black gap was noticed at filling/dentin interface. A distinct line of cold-weld appearance was observed at the apical region of the flame-carrier softened technique.

