

# In-vitro Comparison Of Temperature Changes On External Root Surfaces During Root Canal Obturation With Different Warm Gutta-percha Techniques



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## Abstract

**Introduction:** The aim of this study is to investigate the temperature increase of the external root surfaces of mandibular premolars that shaped with NiTi rotary instruments during filling with warm gutta-percha techniques at different heats by placing thermocouples. Methods: 96 mandibular premolars which cutted from the cementogingival junction as to be 16+1 mm lengths were used in our study. In the first group, 32 teeth were filled with injectable system of Ultrafil®3D (Coltene, Altstätten, Switzerland). In the second group, 32 teeth were filled with continuous wave of condensation technique by using SuperEndo Alphall & Beta (B&L Biotech, Ansan, Korea) device. In the third group as the last, 32 teeth were filled with core-carrier system of Thermafil (Dentsply, Maillefer, Germany). To investigate the temperature increase of the external surface of roots, thermocouples were placed. These were settled 3 mm (T1), 7 mm (T2) and 11 mm (T3) coronally to apical foramen on the vestibular face, 5mm (T4), 9 mm (T5) coronally to apical foramen on the lingual face and next to apical foramen (T6) on the lingual face. Temperature changes measured in groups were analyzed by repeated measurements. P-values below 0.05 were evaluated as statistically significant results. Results: According to our results in all groups, changings of the temperature on the root surfaces were measured below 10° degrees which is a critical value. When comparing to the measured values of each thermocouple for 60 seconds, the temperature increase on the external root surface the highest temperature changing occurred in the canal fillings with the SuperEndo device that reaches 200°, which was used in a continuous wave of condensation technique. The lowest temperature changing value was noted with low heated injectable system of Ultrafil®3D (Coltene, Altstätten, Switzerland) that reaches 90°. Temperature changings in thermocouples were higher in the coronal ones than the apical ones. Conclusion: In the light of all these data, it can be said that the use of warm gutta-percha root canal filling techniques can be used safely by practioners when applied carefully and according to manufacturer instructions. Key Words: Warm gutta-percha, SuperEndo, Ultrafil, Thermafil, thermocouple.

## Biography

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