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Evaluation of Obturation Quality in Round and Irregular Root Canals

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Abstract

Objective: This study compared the quality of root canal obturation in round and irregular-shaped canals at two cross-sectional levels by evaluating the canal area filled by two core materials using two obturation techniques.

Methods: Single canals in 60 mandibular premolars were instrumented, irrigated and divided into four equal groups. They were root filled as follows: lateral compaction/RealSeal™ (LC/R), lateral compaction/gutta-percha (LC/GP), warm vertical compaction/RealSeal™ (WC/R) and warm vertical compaction/gutta-percha (WC/GP). The teeth were sectioned horizontally at 3 mm (L3) and 6 mm (L6) intervals from the obturated canal terminus. Shapes of canals in all cross-sections were examined using a Leica Qwin Colour (RGB) image analyzer. To determine whether the shape of each canal was round or irregular, the buccolingual and mesiodistal canal diameters were measured. The cross-sectional area of RealSeal™ and gutta-percha core materials were measured utilizing the same image analyzer. Data were analyzed using general linear model and independent sample t test.

Results: Descriptively, at L3 and L6, the areas of both filling core materials were higher in round than in irregular canals. WC/R and WC/GP also showed higher areas than LC/R and LC/GP in irregular canals. Statistically, at L3, there were no significant differences in obturation quality between round and irregular-shaped canals ($p>0.05$). At L6, for techniques, there were no significant differences between the two shapes ($p>0.05$). For materials, at L6, WC/R showed a significantly higher area than WC/GP in irregular canals ($p<0.05$). However in round canals, there was no significant difference ($p>0.05$). For LC/R and LC/GP, there were also no significant differences between both shapes at L6 ($p>0.05$).

Conclusions: Generally, obturation quality was better in round than in irregular canals. WC/R and WC/GP produced better adaptation than LC/R and LC/GP in irregular canals especially for WC/R at L6. (Supported by P0191/2006B, University of Malaya).

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