ASSESSMENT OF THE TIP SURFACE OF GUTTA-PERCHA CONES AFTER DIFFERENT CUTTING METHODS

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ABSTRACT
The surface of gutta-percha cones was evaluated after using five different cutting methods, including a new TipSnip device. The gutta-percha cones were cut off using: 1) TipSnip, 2) a single cut with a scalpel blade using a gauge, 3) two cuts with a scalpel blade using a gauge, 4) a razor blade against a glass slab or 5) scissors. Samples were examined under stereomicroscopy and observed by three highly qualified evaluators. The Kappa coefficient with a 95% confidence interval was used and all scores were tabulated and analyzed statistically using a nonparametric Kruskal-Wallis test with a 5% significance level. Cutting with scissors produced significant irregularities in the cone surface, providing the worst result. TipSnip, two cuts with scalpel blade, and cut with a razor against a glass slab provided the best results. A regular surface on the tips of gutta-percha cones improves apical fit, and may be achieved by means of different cutting methods.

Key Words: gutta-percha, root canal filling materials, root canal obturation.

INTRODUCTION
The purpose of endodontic treatment is to remove pulp tissue, eliminate root canal infection and fill the root canal system properly. The root canal filling stage of root canal treatment aims to entirely fill the recently decontaminated root canal system in order to prevent bacterial micro-leakage from the oral environment and apical and periradicular tissues. Fluid infiltration from the periradicular tissues into the root canal system may provide nutrition to remaining bacteria and enable their proliferation. These bacteria may enter through the apical foramen and/or lateral canals, initiating or perpetuating injury in periapical tissues. An apical seal prevents the entry of tissue fluid into the canal, also preventing the exit of bacteria from the canal to the periradicular tissues.

Most root canal treatments use gutta-percha in combination with an endodontic sealer. An important step in obtaining adequate apical seal is good fit of the main gutta-percha cone. Its apical diameter should match that of the final instrument used in the preparation of the root canal system. Previous studies have shown significant differences between the apical fit of gutta-percha cones after different cutting methods.