

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.

EVALUACIÓN DE LA SUPERFICIE DE CONOS DE GUTAPERCHA DESPUÉS DE SER CALIBRADOS CON DIFERENTES MÉTODOS DE CORTE

RESUMEN

Fue evaluada la superficie de conos de gutapercha después de ser calibrados con cinco diferentes métodos de corte, incluyendo el nuevo dispositivo TipSnip. Los conos de gutapercha fueron cortados con TipSnip, con un corte con hoja de bisturí en regla calibrada, con corte de ida y vuelta con hoja de bisturí en regla calibrada, con hoja de afeitar sobre una platina de vidrio, o con tijeras. Las muestras fueron observadas bajo microscopía estereoscópica y examinadas por tres evaluadores altamente calificados y previamente calibrados utilizando el coeficiente Kappa con intervalo de confianza del 95%; todos los resultados fueron tabulados

y analizados estadísticamente mediante el test no paramétrico de Kruskal-Wallis con un nivel de significancia del 5%. El corte con tijeras produjo significativas irregularidades en la superficie del cono, siendo el grupo con peores resultados. El corte con TipSnip, el corte de ida y vuelta con hoja de bisturí, y la hoja de afeitar obtuvieron los mejores resultados. Una superficie regular en la punta de los conos de gutapercha mejora la adaptación apical, y esto puede conseguirse por medio de diferentes métodos de corte.

Palabras clave: gutapercha, material obturador; obturación de conductos radiculares.

INTRODUCTION

The purpose of endodontic treatment is to remove pulp tissue, eliminate root canal infection and fill the root canal system properly¹⁻³. 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 tissues⁴. 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 for-

men and/or lateral canals, initiating or perpetuating injury in periapical tissues⁵⁻⁷. An apical seal prevents the entry of tissue fluid into the canal, also preventing the exit of bacteria from the canal to the periradicular tissues⁸⁻¹⁰.

Most root canal treatments use gutta-percha in combination with an endodontic sealer¹¹⁻¹⁴. 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 system¹³⁻¹⁵. Previous studies have shown significant differences between the api-