

CLINICAL INSIGHTS
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Gutta-Perch substitute Biocalex - Endocal 10 causes fractures

Endocal 10, previously known as Biocalex, has been used as a substitute for gutta-percha in endodontic obturation. Although used for more than thirty years in Europe it has not been popular in the United States. Endocal 10 was recently approved by the FDA. Many dentists with holistic practices are using Biocalex/Endocal as a substitute for gutta-percha citing the safety of the material in terms of biocompatibility and allergic reactions.

A recent study had demonstrated that Endocal can, if properly used, seal the root canal system as well as gutta-percha. It has properties that are favorable: (1) diffusion into dentinal tubules, (2) conversion to calcium hydroxide, (3) biocompatibility, and (4) expansion upon setting to enhance the seal. These properties are very advantageous, however, it is the expansion of the material that is of concern.

In the Goldberg study referenced below, 20% of all specimens filled with Endocal resulted in root fracture. This has long been known in the endodontic community but never before published. In 2000, the American Association of Endodontists published a position paper on Biocalex cautioning users about the potential for root fracture.

Endocal 10 is calcium oxide combined with zinc oxide in a solution of ethylene glycol and distilled water. The calcium oxide combines with water to form calcium hydroxide. This mixture expands upon setting and drives the mixture into dentinal tubules and lateral canals. The study compared Endocal 10 and vertically compacted warm gutta-percha. There were no vertical fractures in the gutta-percha group. Twenty percent of the Endocal group fractured immediately after setting for 24 hours, then 7 and 10 days.

The rationale for use of non-gutta-percha materials is based on perceived biocompatibility and allergenicity issues. As a result of the chemical similarity between natural rubber latex and gutta-percha, questions have arisen concerning the use of gutta-percha in patients with a history of natural rubber latex allergy. Gutta-percha is a biologically inert material that has demonstrated proven success when used with an appropriate sealer to obturate root canals. Concerns of allergic reaction to gutta-percha has been addressed in the recent literature. A study published in 2001 reported no detectable cross-reactivity with gutta-percha products and natural rubber latex. Only raw gutta-balata released proteins that were cross reactive with Hevea latex. The authors concluded that the absence of gutta-percha proteins that can react with Hevea latex specific IgE antibody supports the minimal potential for commercially available gutta-percha to induce allergic symptoms in individuals sensitized to natural rubber latex.

As a commitment to delivering the highest quality of endodontic treatment for your patients, our practice will only use the safest and most scientifically proven materials in our specialty. We do not recommend the use of Biocalex/Endocal 10 as a substitute for currently proven endodontic obturation techniques.

Goldberg RA, Kuttler S, Dorn SO. The properties of Endocal 10 and its potential impact on the structural integrity of the root. *J Endodon* 2004;30:159-162.

Costa GE, Johnson JD, Hamilton RG. Cross reactivity studies of gutta-percha, gutta-balata and natural rubber latex (hevea brasiliensis). *J Endodon* 2001;133:1357-67.