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Remineralizing capacity of zinc oxide eugenol sealer following the addition of nanohydroxyapatite-tyrosine amino acid: An in vivo animal study

ABSTRACT:

Objective:

Although several sealers have been developed, the zinc oxide eugenol (ZOE) sealer is still used in many private dental clinics. This study aimed to compare the biocompatibility and remineralizing capacity of ZOE sealer with the addition of nanohydroxyapatite-tyrosine amino acid.

Methods:

This study was conducted on Twenty rabbits. The rabbits were divided into four groups based on the test observation period (3, 7, 21, and 28 days) following surgical implantation. General anesthesia was administered to each rabbit, and a subcutaneous incision of approximately 1 ± 0.5 cm was made along the symphyseal area of the mandible of each rabbit. Four bone cavities were generated in the interdental space of the lower jaw between the central and molar teeth of each rabbit, with one longitudinal subcutaneous incision. The ZOE sealers were mixed according to the manufacturer's guidelines and directly inserted within the cavities generated at the end of each test period. The animals were sacrificed, and bone biopsy was carried out at the site of testing. The biopsy samples were obtained and subjected to histological analysis using a low-power light microscope (Olympus C x 21, Japan) and immunohistochemistry using Ki67 antibody.

Results:

The collected information was examined by parametric statistical tests using SPSS software version "22." One-way ANOVA and post-hoc Duncan's tests were used to measure the significance among various groups, with statistical significance set, when " $P \leq 0.01$ ".

Conclusion:

The 20% mixed endodontic sealer displayed excellent outcomes compared to other experimental groups, as identified by higher new bone formation at every evaluation period.