The Effects of Six Root-end Filling Materials and Their Leachable Components on Cell Viability

Oula R. Al-Sa’eed, BDS, MSc®, Ahmad S. Al-Hiyasat, BDS, MScD, PhD®, Homa Darmani, BSc

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Abstract

This study investigated the effect of six root-end filling materials (Retroplast [Retroplast Trading, Dybesøvej, Denmark], Geristore, [DEN-MAT Corporation, Santa Maria, CA], Ketac Fil [3M ESPE, Seefeld, Germany], IRM [Caulk-Dentsply, Milford, DE], Super EBA [Bosworth Company, Skokie, IL], and MTA [Dentsply-Tulsa Dental, Johnson City, TN]) on the viability of Balb/C 3T3 fibroblasts using the [3-(4, 5-dimethylthiazol-2-yl)]-2,5-diphenyl tetrazolium bromide succinate (MTT) assay. Ten discs (5 mm × 2 mm) of each material were eluted in tissue culture medium for 24 hours at 37°C for 3 successive days and the elutes used for cell viability testing and for determination of leached components. The results showed that Retroplast, Geristore, and Ketac Fil increased cell proliferation, whereas Super-EBA decreased cell viability. The proliferative effect of Retroplast and Geristore increased with the eluting time (24 hours, 48 hours, and 72 hours), whereas the effects of the other materials did not significantly change. IRM and MTA did not affect cell viability. High-performance liquid chromatography analysis and atomic absorption spectroscopy showed that there was variation in the amount of leached components from the materials. Our results indicate that the reaction of cells to root-end filling materials varies considerably between materials.

Key Words: Endodontic files, irrigating solutions, NiTi instruments, sodium hypochlorite, surface treatments

* Department of Restorative Dentistry, Faculty of Science, Jordan University of Science and Technology, Irbid, Jordan
† Department of Applied Biology, Faculty of Science, Jordan University of Science and Technology, Irbid, Jordan

Address requests for reprints to Dr Ahmad S. Al-Hiyasat, Department of Restorative Dentistry, Jordan University of Science & Technology, PO Box 3030, Irbid 22110, Jordan

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