# Chapter 3

# APICAL MICROLEAKAGE OF DIFFERENT ROOT CANAL SEALERS AFTER USING VARIOUS IRRIGATION SOLUTIONS AND Er:YAG LASER

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## INTRODUCTION

The main goals of endodontic treatment are to eliminate the microorganisms in the root canal system with chemomechanical preparation and to prevent re-infection by creating tight seals with biocompatible materials (Gutmann &Witherspoon, 2002, Mamootil &Messer, 2007,Siqueira et al., 1997). Since the root canal anatomy is a complex structure, mechanical preparation cannot entirelyrid theroot canals of bacteria and tissue residues that may befood sources for bacteria. *Ex vivo* and clinical studies have indicated that intact areas remain on root canal walls during mechanical preparation, and therefore, it is important to perform irrigation in addition to mechanical preparation (Mohammadi &Abbott, 2009, Peters et al., 2001)..

Besides irrigation solutions, various lasers have been used in root canal cleaning; in fact, they have been used to remove the smear layer from the dentin surface in both clinical and scientific research (Guneser,Arslan &Usumez, 2015, Gupta I et al., 2011, Gurbuz et al., 2008, Lagemann et al., 2014, Martins et al., 2014, Meire et al., 2012, Silva et al., 2012).

There is a strong relationship between the quality of endodontic treatment (i.e, with inadequate/adequate root canal obturation) and periapical lesions (Gillen et al., 2011, Nur et al., 2014). Inadequate root canal obturationsnegatively affect the

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