

## Comparison of Er:YAG Laser with Bur Prepared Cavities: A Systematic Review

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**Abstract :** With the concepts of minimally invasive treatment and preventive dentistry gaining more and more recognition by dentists, there are many published clinical trials comparing the use of the erbium laser with traditional drilling for caries removal. However, the efficacy of the erbium laser is still controversial. The aim of this review study is to compare the effects of tooth preparation by laser irradiation and conventional preparation by bur to identify the best means for cavity preparation and reduction of recurrent caries. Randomized controlled trials, controlled clinical trials, and prospective, and retrospective cohort studies were included in this review. The eligibility criteria included studies in humans' permanent teeth in which cavities were conducted in their cervical third and proximal surfaces. PubMed, Google scholar, and Scopus about Er:YAG laser and bur prepared cavities were carried out. The studies' details were organized in four tables according to the groups: (1) Microleakage; (2) Morphological changes; (3) Microhardness; and (4) Bond strength. The initial search resulted in 134 articles, 12 studies published from 2012 up to March 2020 were included in this review. According to the risk of bias evaluation, all studies were classified as high quality. Clinical implications: Er:YAG lasers with the energy levels between 250 to 300 mJ can be proper alternatives to conventional burs, as minimal invasive instruments with no significant differences or better results in microleakage, microhardness, and bond strength compared with conventional burs. In conclusion, Er:YAG laser irradiations accompanied by phosphoric acid etching can reduce the chance of recurrent carries.

**Keywords :** lasers, drilling, caries, micro leakage

**Conference Title :** ICACDOTDH 2023 : International Conference on Advanced Cosmetic Dentistry, Oral Treatments and Dental Health

**Conference Location :** San Francisco, United States

**Conference Dates :** June 05-06, 2023