



Introduction

- LASERs are increasingly being used as an alternative to conventional periodontal treatment, both surgical and non-surgical.
- Several types of LASERs with different wavelengths are commonly used.
- Current evidence is controversial regarding the success and predictability of the use of LASERs for the treatment of periodontal disease, including pocket depth (PD) reduction, treatment of vertical bony defects, peri-implantitis, and peri-implant mucositis, among others.

Objectives

- ✓ To perform a literature review regarding the use of specifically Erbium LASERs for the treatment of vertical bony defects.
- ✓ To present a case report in which an Er:YAG (2940nm wavelength) was used to treat a periodontal angular defect.

Case Study

A **61-year-old female** presents to the Touro College of Dental Medicine (TCDM) for treatment of periodontal disease. Medical history reveals **hay fever** and **penicillin allergy**. Upon clinical examination, she was diagnosed with **Generalized Stage III Grade B Periodontitis**, where mostly her remaining posteriors were involved, and with a **PD of 8 mm at #23 distal (buccally and lingually)**. After treatment plan presentation, **patient opted for LASER treatment**.

Review of Literature

Methods

- A literature search was conducted using PubMed and Scopus databases.
- Articles were screened by relevance regarding the use of Er:YAG LASERs in treating angular periodontal defects.

Results

- Er:YAG LASER treatment of the periodontal pocket can decontaminate, debride, and remove inflammatory tissues to prevent downgrowth of pocket epithelium.¹
- Simultaneously exerted low-level energy (LASER) effect may modulate periodontally related cell proliferation and differentiation, leading to enhanced wound healing and regeneration.¹
- The clinical efficacy of the Er:YAG LASER therapy was similar to that achieved after mechanical debridement of periodontal pockets.²

¹ Lin TC, Wang KH, Chang YC. Er:YAG laser-assisted non-surgical approach for periodontal infrabony defects. J Dent Sci. 2019 Mar;14(1):101-102. doi: 10.1016/j.jds.2018.09.003. Epub 2018 Oct 12. PMID: 30988887; PMCID: PMC6445972.

² Papakoca, K., & Petrovski, M. (2021). LASER ASSISTED PERIODONTAL TREATMENT. KNOWLEDGE - International Journal, 44(2), 171-175. Retrieved from <http://ikm.mk/ojs/index.php/kij/article/view/33>

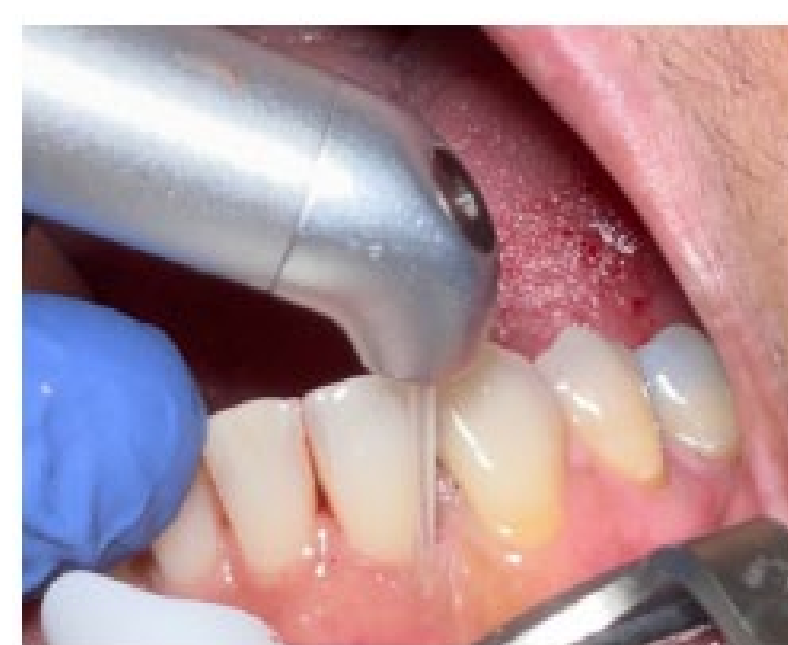


Figure 1: The Er:YAG LASER (2940 nm) was set at 50mJ, 20Hz, with copious irrigation and air cooling to proceed with decontamination of disto-buccal pocket of #23.



Figure 2: The Er:YAG LASER (2940 nm) was set at 50mJ, 20Hz, with copious irrigation and air cooling to proceed with decontamination at distal-lingual pocket of #23.



Figure 3: Ultrasonic scaler was used for debridement of the root surface, using copious water irrigation to remove debris and to cool the instrument tip.



Figure 4: The Er:YAG LASER was then used, set at 30mJ, 10 Hz without irrigation, to complete the coagulation phase.



Figure 5: Formation of a stable blood clot. Post-op instructions were given (not to brush or floss), and patient was dismissed.

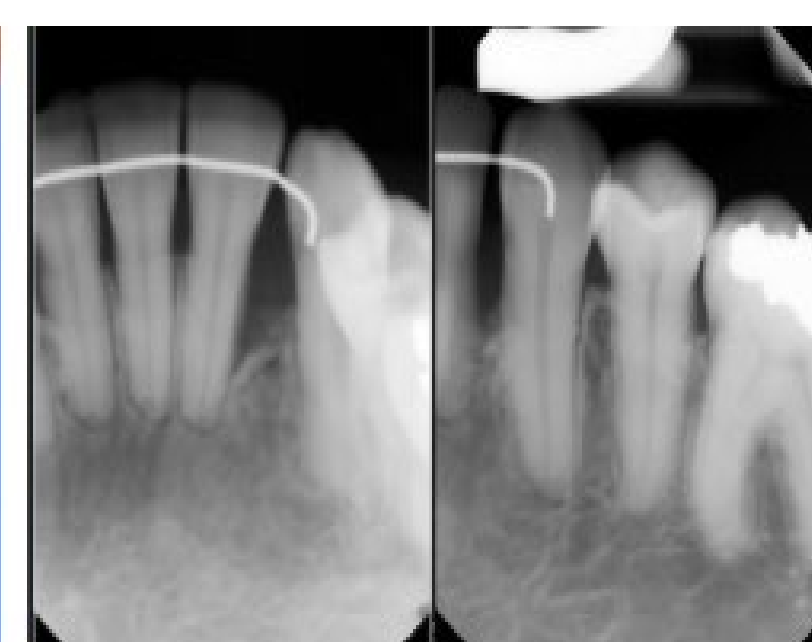


Figure 6: PAs taken the day of procedure and 1 mo. post-op. 1 mos. post-op PA showed significant improvement, as bone fill was noticeable.

CONCLUSION

- The use of Er:YAG proved successful in the treatment of a deep angular defect in the lower anterior. This improvement was evident only 1-month post-op, and future follow-ups will determine if further enhancement is seen, as well as the long-term maintenance of the treatment.
- This case report will be used to design a prospective study to further assess the short and long-term success of Er:YAG in the treatment of periodontal defects at TCDM.