



Enhancing endodontic surgery with photodynamic therapy: A promising complementary approach

Dear Editor-in-Chief,

The use of antimicrobial photodynamic therapy (aPDT) as an adjunct therapy has gained widespread acceptance in endodontics due to its potential of reducing both gram-positive and gram-negative bacteria following mechanical debridement [1].

Recent investigations further reinforce the promising therapy in this field. Kattan et al. (2023) and Suresh et al. (2024) [2,3] confirmed improved antimicrobial outcomes when mechanical root canal treatment is associated with aPDT. However, the application of aPDT in endodontic surgery remains underexplored despite distinct procedural and biological differences between conventional endodontic treatment and surgery.

Poli et al. (2022) [4] provided evidence supporting aPDT's benefits in surgical contexts, including enhanced disinfection and bone repair stimulation. Recent studies also demonstrated promising results regarding aPDT in endodontic microsurgery, such as de Araújo et al. (2024) [5], who reported great outcomes applying curcumin-based as the photosensitizer. Nonetheless, this study represents one of the few available reports addressing aPDT in endodontic surgery, highlighting a significant gap in the current literature.

Despite promising results, clinical standardization remains a major challenge. There is considerable heterogeneity in reported protocols regarding light irradiation parameters, including wavelength, exposure time and mode of delivery. This gap limits reproducibility and comparison across studies. Moreover, even though traditional photosensitizers such as methylene blue and toluidine blue are well-established in the literature, interesting studies in growing natural photosensitizers like curcumin and chlorin derivatives due to their potential advantages, including low toxicity and bioactivity are being explored.

In conclusion, aPDT holds significant promise as an adjunct in endodontic surgery treatments, enhancing decontamination and stimulating tissue repair. However, current evidence is limited, underscoring the need for further clinical research aimed at standardizing effective light irradiation protocols and exploring diverse photosensitizers. Addressing these gaps will be critical for exploring the benefits of aPDT into routine surgical endodontic practice.

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Declaration of competing interest

The authors declare no conflicts of interest.

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