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Er: YAG Laser-Assisted Debonding of Ceramic Crowns and Veneers: A Minimally Invasive Technique

The increasing use of adhesively bonded ceramic restorations necessitates reliable and conservative methods for their removal. Conventional mechanical debonding techniques are often invasive, time-consuming, and associated with irreversible damage to both restorations and tooth structure. Er:YAG laser-assisted debonding has been proposed as a minimally invasive alternative, enabling selective disruption of resin-based luting cements while preserving surrounding tissues.

The Er:YAG laser, operating at a wavelength of 2940 nm, exhibits high absorption in water and organic components of dental cements. This allows efficient energy transfer to the bonding interface, resulting in thermal softening and ablation of the cement layer without inducing excessive intrapulpal temperature rise. As a consequence, ceramic crowns and veneers can be removed atraumatically, frequently intact, and with minimal patient discomfort.

This lecture reviews the underlying physical mechanisms, clinical protocols, and laser parameters influencing debonding efficiency. Indications, limitations, and safety considerations are discussed, supported by clinical cases involving lithium disilicate and zirconia-based restorations. Er:YAG laser debonding represents a predictable and tissue-preserving approach consistent with contemporary principles of minimally invasive dentistry.

Biography

She is affiliated with the Dental Office—Artistic Smile Studio, located at Tarnów, Poland Her research, published in 2025, focuses on dental, microbiological, and medical topics, including: Laser Dentistry: Evaluation of the disinfection efficacy of Er:YAG laser light on single-species *Candida* biofilms. Medical Research: Investigations into nanoplastics and their impact on immune disruption. Scientific Contribution: She has contributed to systematic reviews, including those published in PMC (PubMed Central) and ResearchGate in 2025