Effect of Initiators on Thermal Changes in Soft Tissues Using a Diode Laser (0096)

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Introduction and Objective: The initiation of a diode laser tip increases the efficiency of the incisions produced by the laser. Different types of initiators can be used. The aim of this study was to determine the effect of various initiators on the thermal changes that occur during incisions performed in soft tissues.

Methods: Thermal changes were observed during incisions in chicken breast (without skin) via thermo-elements over a 5-second irradiation period by a 975-nm diode laser. The laser fiber had a 320-micron diameter. Incisions (five in each group) were performed with and without an initiator (control group). Red/blue articulating paper and cork were the initiators used in this study. The tissue was irradiated in a continuous wave mode at 3 and 6 W.

Results: At a power of 3 and 6 W without any initiator, the thermal increase was the greatest, reaching a mean temperature of 27.5°C vs. 29.8°C, respectively. Cork initiator at 3 and 6 W resulted in temperature increase, reaching a mean temperature rise of 26.6°C vs. 27.3°C, respectively. Incisions made using the blue/red articulating paper-initiated tip reached mean temperatures of 23.1/24.8°C vs. 27.2/29.2°C at 3 and 6 W power settings, respectively.

Conclusion: Within the limitations of this study, all of the initiators are safe to use. The power settings of the diode laser and type of initiator used both affect the degree to which the temperature of the soft tissue increases during incisions.

Educational Objectives
- Demonstrate the effects of initiators on soft tissues.
- Illustrate diode laser-tissue interactions.
- Present scientific information regarding thermal damage in order to minimize potential damage complications from diode laser-assisted dental surgery.
Ms. Sacks is a student of dentistry at Stony Brook University, New York and is interested in new developments related to laser dentistry. She has a Mentorship with Professor Dr. Georgios Romanos with a special focus on laser-tissue interactions.

**Disclosure:** Ms. Sacks has reported no commercial affiliations or personal conflicts of interest relative to this presentation.

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