

The tensile strength of laser welding of an incision in the keratinized oral mucosa of rabbits *in vivo*

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Abstract

Introduction: In this study, coagulation of the blood at the wound side is evoked using a 980-nm-wavelength diode laser. The laser is used to approximate incision wound edges to be compared with the healing of the sutured incision. Quality of healing is accessed by the Clinical observations, histological slides, and tensile strength measurement.

Material and methods: The study is conducted on 24 albino rabbits; an intraoral incision in the hard palate is done on both sides, right and left, for each rabbit. One side serves as a control group where the incision is sutured, while the other side's incision is welded by a 980-nm-wavelength laser. The laser is operated in continuous wave mode (CW) 20 W/cm² power density for 27s exposure time.

Results: Clinically, some loss of tissue details (smooth feature) are observed on the welded side in comparison with the conventionally treated side. Histopathologically, healing of the epithelial layer was perfect, while the submucosal layer showed loss of angiogenesis and loose connective tissue replacing the normal structure. The tensile strength measurement shows comparable results for the welded incision and the sutured incision; moreover, the immediate and first-day tensile strength of the welded incision shows superior results to the sutured incision. **Recommendation:** Further studies are needed to monitor histologically the healing after laser welding and measure the development in the tensile strength to assess the validity of the 980-nm-wavelength laser beam as a tool in tissue welding.

Conclusion: Laser beam with nine hundred eighty-nanometer-wavelength is a suitable tool for welding incisions in the oral cavity at areas subjected to stress, such as a socket after tooth extraction.

Biography

Balsam M Mirdan has her expertise in evaluation and passion in improving the health and wellbeing. Her open and contextual evaluation model based on responsive constructivists creates new pathways for improving healthcare. She has built this model after years of experience in research, evaluation, teaching and administration both in hospital and education institutions. The foundation is based on fourth generation evaluation (Guba & Lincoln, 1989) which is a methodology that utilizes the previous generations of evaluation: measurement, description and judgment. It allows for value-pluralism. This approach is responsive to all stakeholders and has a different way of focusing.

Publications

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5. Mirdan, B. M., Naji, S., Sarp, A. S. K., & Gulsoy, M. (2019). The tensile strength of laser welding of an incision in the keratinized oral mucosa of rabbits *in vivo*. *Lasers in Dental Science*, 1-7.

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