

A preliminary study of healing of superpulsed carbon dioxide laser incisions in the hard palate of monkeys

Type:

Article

Abstract:

Background and Objective: Prior studies of laser wound healing using different animal models have shown a delayed tissue response after carbon dioxide (CO₂) laser application. This article reports on the preliminary findings of healing of superpulsed CO₂ laser and scalpel incisions in the hard palate of monkeys. **Study design/Materials and Methods:** Twelve parallel incisions using a superpulsed, continuous wave CO₂ laser and a scalpel were performed in the hard palate of each of two adult monkeys at 3, 7, and 14 days time schedules. Power levels of 2.0, 4.0, and 6.0 Watts were used for the laser incisions. Wounds were harvested, fixed in 10% formal saline for at least 48 hours and processed routinely. Each specimen was embedded in paraffin wax at 90 degrees to the surface epithelium and 5 µm thick sections prepared for staining with haematoxylin and eosin, Periodic acid Schiff and Masson-trichrome at a step-serial interval of 100 µm. Sections were evaluated independently. **Results:** According to the clinical findings we showed a wound closure in all of the wounds (laser and scalpel incisions) at 3, 7, and 14 days of healing. Histologically, we showed that laser incisions at three and seven days demonstrated an increased, power setting-dependent tissue necrosis and marked inflammatory response with minimal organization compared to scalpel incisions. At 14 days both types of incisions exhibited complete wound healing of the epithelium and connective tissue. **Discussion and Conclusions:** According to these preliminary results, superpulsed CO₂ laser tends to produce more pronounced changes (due to tissue thermal damage) with corresponding greater inflammatory reaction and delay in tissue organization only initially. (C) 1999 Wiley-Liss, Inc.

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