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NON-INVASIVE MEASUREMENTS OF MICROCIRCULATION IN THE BURN WOUND

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Introduction: Clinical evaluation of burn wound depth, esp. in superficial partial and deep partial thickness wounds still remains difficult but is critical in surgical decision making. Reduced circulation in burn wounds is attributed to prolonged healing and subsequent scarring. Reduced microcirculation is considered an underlying cause in the progression of partial thickness burn wounds. The O2C system (LEA Medizintechnik, Germany) allows the measurement of blood flow, velocity, oxygen saturation and hemoglobin in microvessels of the skin in a non-invasive mode by laser doppler technique.

Methods: 86 burn wound sites in 20 patients were clinically evaluated and measured with the laser doppler O2C system. Clinical assessment and measurements were performed immediately after the burn insult (<24 hrs) and on each consecutive day up to day 3 and at day 7, 10, 14, and 21 postburn.

Results: Clinical assessment of the burn wounds correlated well with flow and velocity in the microcirculation. A significant correlation was seen between healing time of the second degree wounds and flow and velocity parameters immediately after the thermal trauma. No difference was observed between sequential measurements at day 1 and day 3 of the same wound site.

Conclusions: Monitoring microcirculation parameters of the burn wound adds valuable objective findings to the diagnostic assessment of and the decision making in burn wounds. More investigations on the microcirculation in the zone of stasis seem warranted in order to improve perfusion and healing.

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