

ABSTRACT

Previous studies have assessed the effects of changes in microcirculation on wound healing; however, the influence of microcirculation on tissue histomorphology remains widely unknown. Reflectance-mode-confocal microscopy (RMCM) enables in vivo tissue observation on a cellular level. We present RMCM data evaluating the local microcirculation and assess the influence on histomorphology during burn healing. RMCM was performed in 12 patients (aged; 36.2 +/- 14.2 years, maximum-burn-extent: 4% total body surface area) at times 12, 36, and 72 hours after a superficial burn. The following parameters were assessed: quantitative blood-cell-flow (cbf), epidermal thickness (Emin), basal-layer thickness (tbl), and granular cell-size (Agran). Cbf was found to be 54 +/- 3.6 cells/minutes (control), increased to 91 +/- 3.6 cells/minutes (p<0.05) 12 hours postburn; decreased to 71 +/- 6.1 cells/minutes (p<0.05) (36 hours), and to 63 +/- 2.3 cells/minutes (p>0.05) 72 hours postburn. Emin was 43.74 +/- 3.87 mum (control), increased to 51.67 +/- 4.04 mum (p<0.05) 12 hours, decreased to 48.67 +/- 3.51 mum (p<0.05) 36 hours, and to 45.33 +/- 3.21 mum (p>0.05) at 72 hours postburn. Tbl was 14.17 +/- 0.6 mum (control), increased to 16.93 +/- 1.15 mum (p<0.05) 12 hours, decreased to 15.93 +/- 1.20 mum (p<0.05) 32 hours, and to 15.00 +/- 0.85 mum (p>0.05) 72 hours postburn. Agran was 718 +/- 56.20 mum(2) (control), increased to 901 +/- 66.02 mum(2) (p<0.05) 12 hours, decreased to 826 +/- 56.86 mum(2) 36 hours, and 766 +/- 65.06 mum(2) at 72 hours postburn. RMCM enables in vivo observation of wound microcirculation and allows direct assessment of vascular effects on cutaneous histomorphology during the healing course of superficial burns.