Medical > In Vivo > Burn Injuries

8 Assessment of microcirculatory influence on cellular morphology in human burn wound healing using reflectance-mode-confocal microscopy.

Altintas AA, Altintas MA, Ipaktchi K, Guggenheim M, Theodorou P, Amini P, Spilker G.; Wound Repair Regen. 2009 Jul-Aug;17(4) DOI:10.1111\j.1524-475X.2009.00516.x:17 498-504

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.