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Cell interactions between mast cells and dendritic cells in human skin wounds

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The response to wounding passes through different phases and mast cells (MC) respond to injury since early [1]. These cells can interact with dendritic cells (DC) and lymphocytes in vitro to control immune responses [2], but possible interactions between MC and DC in the early response to wounding in vivo have not yet been investigated. To address this issue, cryosections of skin wounded since 0-24 h taken at autopsy were stained with fluorescent avidin (MC) and UEA-1 (Ulex europaeus-1 lectin: endothelium), and immunolabeled for MHC-II (DC), CD1a (Langerhans cells, i.e. epidermal DC) and PDGF (endothelium). Fluorescence microscopy was followed by computerized image analysis. Intact neighbor skin was used as control. Langerhans cells number increased significantly with a peak 5 min after wounding. The intensity of MHC-II expression and the relative volume of MHC-II+ cells in the dermis increased significantly since 5 min after wounding and remained high for several hours. These cells became part of a perivascular mononuclear cell infiltrate visible in the subpapillary dermis since 60 min after wounding, which contained also MC strictly close to MHC-II positive cells. Upon wounding the number of capillaries labeled by UEA-1 and for PDGF increased markedly. The results suggest that: immature cells residing in the epidermis may come to express CD1a quickly; DC recruitment and redistribution in the dermis may occur quite fast upon injury; the latter cells participate to the response to wounding since the early steps, coordinately with MC and close to capillaries. Therefore DC, together with MC, may be candidate to regulate early injury response in human skin.

[1] Bacci et al. J. Forensic. Sci. 2011 (in press)
[2] Dudeck et al. Eur. J. Immunol. 2011; doi: 10.1002/eji.201040994.

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