

THE HEALING AND NON-HEALING FRACTURE GAP AND REACTION OF THE DRAINING LYMPH NODES

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Damage of tissues by mechanical injury and inflammation is followed by response of regional lymphoid tissue. We proved previously that closed injuries of soft tissues and bones bring about long-lasting response of the local lymphatic system.

Aim: The aim of the study was to answer the question whether histological changes in the damaged tissues may be reflected in the regional lymph nodes.

Materials and methods: Patients. Studies were performed in randomly selected 25 patients with fractures of bones of lower leg without traumatic skin changes. They were qualified to the union (group 1a,b) and non-union (group 2a,b) groups. Lymphoscintigrams were obtained from both extremities after subcutaneous injection of ^{99m}Tc-Nanocol (3 mCi) into first web space. Twelve patients with tibial fracture were randomly selected for fracture gap tissue harvesting for histochemical studies.

Results: Lymphoscintigraphies. Group 1a. Seven months after injury calf lymphatics were 2.44 ± 1.45 ($p=0.01$), these of thigh 2.17 ± 1.41 ($p<0.05$) and inguinal nodes 1.78 ± 0.87 -times ($p=0.015$) larger in fractured leg with union than on contralateral limb. Group 2a. Thirty months after fracture calf lymphatics were 0.43 ± 0.24 , ($p=NS$), these of thigh 0.86 ± 0.98 ($p<0.05$) and inguinal nodes 0.43 ± 0.24 -times ($p=0.001$) smaller in non-union leg than on contralateral limb. Histopathology. Group 1b. In all specimens multicellular structure with dispersed bone formation was observed. Trichrome staining revealed presence of collagen deposits. The CD68+ cells formed foci. Multiple HLA DR+ cells but sporadically T CD4 and CD8 but no B lymphocytes could be seen. Few CD34 cells were found. Single foci of elastase, BMP2 and collagen II were seen. Group 2b. Specimens were mostly acellular. Sporadically foci of mononuclear infiltrates staining for HLA DR, CD68 and CD4 were observed.

Conclusions: The healing fractures are accompanied by enlarged lymph nodes. Lack of fracture healing results is accompanied by decrease of draining nodes.