

CLOSED FRACTURE CALLUS MAY CONTAIN MICROBES RESPONSIBLE FOR NON-UNION

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More than 1% of closed fractures of lower limbs and 6% of implanted materials are complicated by inflammation despite all efforts to avoid infection.

Aim: The question arises whether this clinical complication is not caused by bacteria dwelling in limb tissues.

Material and methods: Skin, subcutaneous fat, muscle and fracture gap callus were obtained from 155 adult patients operated on due to closed comminuted fractures of tibia or femur, 75 because of non-alignment of bone axis and 80 due to delayed fracture healing.

Results: Aerobic bacteria were isolated from gap callus of 12% healing and 31% non-healing fractures. In subcutaneous tissue and muscles isolates were found only sporadically. No anaerobic bacteria were detected. PCR amplifications of 16s rRNA were found positive in 40% of callus specimens proving presence of bacterial DNA even when no isolates were found. The 95% similarity of the genetic pattern of some strains from foot skin and callus, estimated with RAPD technique, suggested their foot skin origin.

Conclusions: The colonizing bacterial cells and their DNA were detected in fracture callus but not other deep tissues. Contamination was precluded by lack of isolates in disinfected cutis, subcutis, muscles and materials used for sampling cultured after surgery. We suggest that certain strains of bacteria dwell in normal tissues of lower limbs and may cause inflammation upon stimulation by trauma. Their source may be tissue fluid, superficial and deep lymphatics, and lymph serving the physiological transport to the regional lymph nodes of microorganisms penetrating foot skin during microinjuries.