

IMPORTANCE OF FRACTURE STABILITY IN ACHIEVING WOUND CLOSURE AND UNION IN AN OPEN FRACTURE OF THE PHALANX

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Introduction: Wound healing in an open fracture is a fragile yet complicated process of tissue regeneration governed by several biological and biomechanical processes. Nevertheless, in order for healing to occur, a delicate equilibrium between optimum physiological environment and mechanical stability is mandatory. When there is a disturbance in this balance, healing is often delayed and complicated by issues as non-union and infection. The manner in which mechanical factors influence fracture healing is best explained by Perren's strain theory.

Discussion: In this case review, we describe a 25-year-old fit and healthy army officer diagnosed with an open fracture of the Middle Phalanx Right Index Finger after sustaining a blast injury while handling his rifle. Initial treatment of this injury involved debridement and splinting which inadvertently led to a vicious cycle of non-union and fracture related infection with a chronic non healing wound over the dorsal aspect of the DIPJ with exposed bone. After vigilant antibiotic therapy, he eventually underwent debridement and fracture stabilization with a mini external fixator. His condition subsequently improved notably which was evident by wound shrinkage, evidence of bony union and a stable nail plate.

Conclusion: We review the literature on the importance of biomechanical stability in wound and fracture healing and aids in prevention of fracture related infections. Achieving fracture stability is eminent for bony union and prevention of infection. Although the presence of an implant increases the chances of developing an infection, literature advocates that the advantages of fracture stabilization outweighs this effect.