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NUMERICAL FE SIMULATIONS AND EVALUATION OF TWO TYPE HEEL FRACTURE FIXATION

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Summary: Heel fractures are complex injuries with variable prognoses that depend upon many factors. The aim of the treatment is to restore the heel biomechanical stability and fracture fixation stiffness. The aim of this study was to simulate numerically several fixation techniques of the heel fractures, evaluate their stability, determine their impact on surrounding tissue load, and correlate the results to clinical treatment experience. Six models of heel fracture fixation were used: plate fixation with locked or unlocked screws and with lag screw on three positions. All fracture fixation models were analyzed according to their use in both healthy physiological bone and osteoporotic bone tissue. Based on the results of Finite Element Analysis for these simulations, we found that fixation method for heel fractures was independent to use locked or unlocked screws. Stability of fixations is influenced only by the lag screws position for patients with physiological and osteoporotic bone tissue.