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A biomechanical study comparing proximal femur nail and proximal femur locking compression plate in fixation of reverse oblique proximal femur fractures

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Abstract:

Background: The reverse oblique trochanteric fractures are common fractures and its treatment poses a challenge. The purpose of this study was to compare the biomechanical parameters of the construct using proximal femoral nail (PFN) and proximal femoral locking compression plates (PFLCP) in these fractures using cadaveric specimens.

Materials and Methods: Twenty freshly harvested cadaveric femoral specimens were randomly assigned to two groups after measuring bone mineral density, ten of which were implanted with PFN and the other ten with PFLCP. The constructs were made unstable to simulate reverse oblique trochanteric fracture (AO type 31A3.3) by removing a standard size posteromedial wedge. These constructs were tested in a computer controlled cyclic compressive loading with 200 kg at a frequency of 1 cycle/second (1 Hz) and test was observed for 50,000 cycles or until implant failure, whichever occurred earlier. Peak displacements were measured and analysis was done to determine axial stiffness and subsidence in axial loading.

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