Femoral Neck System Versus Dynamic Hip Screw for Hip Fractures: Is New Always Better?

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Purpose: Femoral neck fractures in the elderly are common and show an increasing incidence. For young and geriatric patients with undisplaced fractures osteosynthesis is the first-line treatment. The dynamic hip screw (DHS) has been in use for many years and proved its value especially in displaced fractures. Since 2018 the femoral neck system (FNS) is available as an alternative, showing promising biomechanical results. The aim of this study was to evaluate clinical results of the FNS and compare it to the DHS.

Methods: Patients older than 18 years with Garden I-IV fractures treated with osteosynthesis in a Level I trauma center were included in the study. 113 patients were treated with FNS (1-hole plate, DePuy-Synthes) and compared with 108 patients treated with DHS (2-hole plate, DePuy-Synthes). Closed reduction was achieved using a traction table for both groups. All surgeries were carried out or supervised by an experienced orthopaedic trauma surgeon. Primary outcome measures were rate of implant failure (cut-out) and surgical complications (hematoma, infection). Secondary outcome measures were difference in hemoglobin levels, length of hospital stay, and mortality.

Results: Overall mean age was 69 ± 14 years. There were 17.2% Garden I, 47.5% Garden II, 26.7% Garden III, and 8.6% Garden IV fractures. There was no difference between the groups for age, body mass index, time to surgery, AO, Pauwels, and Garden classification, rate of optimal blade position or tip-apex distance. FNS showed lower pre- to postoperative difference in hemoglobin levels (1.4 ± 1.1 g/L vs 2.1 ± 1.4 g/L; $P<0.05$), shorter operating time (36.3 ± 11.6 vs 54.7 ± 17.4 min; $P<0.05$) and hospital stay (8.8 ± 4.3 vs 11.2 ± 6.8 days; $P<0.05$). Surgical complications (FNS 13.3% vs DHS 16.7%, $P>0.05$), rate of cut-out (FNS 12.4% vs DHS 10.2%, $P>0.05$), and mortality (FNS 3.5%, DHS 0.9%; $P>0.05$) showed no difference between the groups. Logistic regression showed that poor blade position was the only significant predictor for cut-out, which increased its risk by 7. Implant-related infection (n = 3) and hematoma/seroma (n = 6) was only seen in DHS group.

Conclusion: FNS proved to be as reliable as DHS in all patients with hip fractures. Optimal blade positioning rather than type of implant is still key to prevent implant failure. Using the FNS with its minimal invasive approach, implant-related infections and postoperative hematoma might have been prevented.