

Radiographic Comparison of Sliding Distance in Base Depression and Base Extrusion of Femoral Head Fixation Devices Following Intramedullary Fixation for Intertrochanteric Fractures

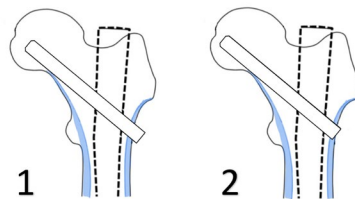
Sukanis Chumchuen, MD; Thakoon Boonnarakorn; Sunyarn Niempoog

Purpose: We set out to compare the sliding distance of head fixation devices (HFDs) between fixation with base extrusion and base depression, and evaluate the factors that affect the cephalomedullary nail (CMN) fixation along with complications in low-energy intertrochanteric fractures.

Methods: A retrospective review of 547 elderly patients with intertrochanteric fractures who were treated with a CMN between January 2011 to December 2020. After excluding 344 patients with poor radiographs or inadequate follow-up, 203 patients were eligible for radiographic measurement and classified whether the base of HFD was in base depression or base extrusion position from the lateral femoral cortex. Radiographic parameters of immediate, 6, and 12 weeks postoperative radiographs were evaluated and normalized using known HFD length. Patient demographics, fracture configuration, implant types, and outcomes were collected and analyzed.

Results: A total of 203 patients were allocated; 102 patients were identified in the base depression group, and the other 101 patients in the base extrusion group. At 6 weeks post-operation compared to immediate postoperative radiographs, the sliding distance of HFDs in the base depression group was significantly less than in the base extrusion group (2.7 ± 3.6 mm vs 4.5 ± 4.1 mm, respectively, $P < 0.001$). and at 12 weeks post-operation (3.2 ± 4.0 mm vs 5.0 ± 4.3 mm, respectively, $P = 0.003$). Calcar gap > 4 mm (mean difference 2.2, 3 mm at 6 weeks and 3 months respectively, $P < 0.001$) and tip apex distance (TAD) > 20 mm (mean difference 1.6 mm at 6 weeks, $P = 0.04$) affected the sliding distance. No association was found between the sliding distance and age, gender, osteoporosis, implant type, fracture configuration, HFD prominence, and position ($P > 0.05$). There were 4 femoral head cut-outs (3 in the base depression group), 5 central perforations (4 in the base depression group), and 4 implant failures (2 in the base depression group) but no statistically significant differences between the groups.

Conclusion: The base depression of HFDs decreases the sliding distance and may increase the rates of screw cut-out and central perforation. Other factors that affected the sliding distance were the calcar gap and TAD. This study raises concern awareness of too deep femoral head fixation devices to achieve less TAD.



2 groups

1. Base of HFD protrude from cortex
2. Base of HFD depress to cortex

See the meeting website for complete listing of authors' disclosure information. Schedule and presenters subject to change.