

## **Does Distal Locking of Intertrochanteric Fractures Treated With Long Intramedullary Nails Enhance Functional Recovery?**

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**Purpose:** Distal locking of long intramedullary nails used for intertrochanteric hip fractures restricts shortening and rotation, but it is unknown if this improves outcomes. Our purpose is to compare the peak recovery and recovery time of patients treated with long nails with (L) or without distal locking (UL) for intertrochanteric fractures.

**Methods:** A prospective consecutive single-surgeon series of patients with intertrochanteric fracture were studied. Patient's age, sex, fracture type, preinjury functional status, and functional outcomes were recorded. All patients were treated with a long third-generation cephalomedullary nail with or without distal locking. Those with subtrochanteric fracture extension or limited follow-up were excluded. In the earlier part of the series patients were all treated without distal locking and then a protocol change was made to include distal locking. The surgeon had done several hundred cases prior to this prospective cohort so a learning curve was not a factor. We compared the best achieved Harris Hip Score (HHS), the lowest visual analog scale (VAS) pain score, and the time to achieve these results between the groups. Finally, we evaluated the patients' estimation of their percent recovery compared to their preinjury state.

**Results:** There were 258 patients (146 female), mean age 83 years (range, 48-102). There were 82 2-part, 14 3-part, and 161 4-part fractures. 2-part fractures were less common in the locked group (18/137 vs 64/120;  $P < 0.0001$ ) and 4-part fractures were more common in the locked group (112/137 vs 49/120;  $P < 0.0001$ ). Length of follow-up in the locked cohort was shorter (500 days [range, 34-2813] vs 637 [32-3868];  $P = 0.01$ ) than the unlocked group. Preinjury ambulatory status was better in the unlocked group than the locked group. The best postoperative HHS scores were L = 75.5, UL = 73.4 ( $P = 0.33$ ) and the lowest VAS pain scores were L = 0.7, UL = 1.0 ( $P = 0.65$ ). The patients' estimation of their highest percent of recovery was 84% for both groups. The days to achieve their best HHS (295 vs 432;  $P = 0.04$ ) and lowest VAS pain (161 vs 260;  $P = 0.04$ ) scores was shorter in the locked cohort. This was mirrored in the patients' assessment of the time to get to their maximal percent recovery, though not statistically significant (295 vs 366 days,  $P = 0.25$ ).

**Conclusion:** We evaluated the postoperative functional outcomes of patients with intertrochanteric fractures treated with long cephalomedullary nailing with and without distal locking. While the best HHS and VAS pain scores were similar in locked and unlocked cohorts, these results were achieved statistically faster (30%-40%) in the locked cohort despite a greater percentage of 4-part fractures and worse initial function. We recommend that long intramedullary nails be distally locked to diminish the time to maximum recovery.