Geriatric Intertrochanteric Femur Fractures: Does Cephalomedullary Nail Length Impact Post-Operative Mortality and Inpatient Complication Rates?

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INTRODUCTION:
The optimal cephalomedullary nail (CMN) length for the treatment of geriatric intertrochanteric (IT) femur fractures is debated amongst orthopaedic surgeons. While short/intermediate CMNs (SIN) have shorter operative times, lower estimated blood loss, and lower transfusion rates compared to long CMNs (LN), it is not well known if nail length impacts post-operative mortality rates. The objective of this study was to compare mortality rates between geriatric patients with IT fractures treated with SINs versus LNs.
METHODS:
Patients aged ≥ 65 years with IT fractures (AO/OTA 31A1 – 31A3) treated with a CMN at a single academic level I trauma center between 2008 to 2020 were retrospectively identified. CMN lengths were classified as follows: short nails < 240mm, intermediate nails ≥ 240 mm and ≤ 280 mm, and long nails > 280mm Demographic variables and complications were collected via the electronic medical record. The primary outcome was mortality at 30 days, 90 days, and 1-year post-operatively. Secondary outcomes included incidence of postoperative complications. Differences in demographic and outcome variables were analyzed using *t*-tests, Fisher's exact tests, and chi-square tests, as appropriate. Across all analyses, a *p*-value < 0.05 was considered statistically significant.
RESULTS:
In total, 881 patients with IT fractures were treated with a SIN (n=327) or LN (n=554). While the SIN group was older than the LN group [80.7 ± 9.1 (SIN) vs 79.3 ± 8.4 (LN), p=0.016], the groups were similar in all other demographic variables (p>0.05). There was no difference in 30-day (7% vs 8%, p=0.571), 90-day (13% vs 12%, p=0.971), or 1-year mortality rates (23% vs 22%, p=0.63). The SIN group had lower rates of ICU stay (5% vs 9%, p=0.031), transfusion (43% vs 54%, p=0.001), and shorter procedure length (60 vs 87 minutes, p<0.001). There were no significant differences in other post-operative complications including stroke, arrhythmia, myocardial infarction, pulmonary embolism, and post-operative anemia (p>0.05).
DISCUSSION AND CONCLUSION:
Geriatric patients with IT fractures treated with SINs had comparable mortality rates to those treated with LNs. However, patients treated with SINs had significantly shorter operative times, lower transfusion rates, and lower rates of post-operative ICU stay. Surgeons should consider these factors in addition to fracture characteristics and host biology when determining appropriate CMN length.