Basicervical Femoral Neck Fractures (OTA 31B3): Does Implant Choice Matter?

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Purpose: This study was undertaken to compare the efficacy of short cephalomedullary nails (CMNs) with a single lag screw to sliding hip screws (SHSs) with or without a derotation screw for the treatment of basicervical femoral neck fractures (OTA/AO 31B3).

Methods: A consecutive series of patients who presented with a basicervical femoral neck fracture (OTA/AO 31B3) treated with a CMN or SHS was identified. Demographic, clinical, quality, radiographic, and cost data were obtained for each patient. A validated risk predictive tool (Score for Trauma Triage in Geriatric and Middle-Aged Patients [STTGMA]) was calculated for each patient. Patients were excluded if they did not have adequate follow-up demonstrating healing, failure of the implant, or if they did not have aforementioned fixation constructs. Mann-Whitney U, independent t test, and Fisher's exact tests were used to compare outcomes using R software.

Results: 65 basicervical fracture (OTA 31B3) patients were identified. 41 patients were treated with a short CMN compared to 24 patients treated with an SHS. The cost of treatment with a short CMN ($8999.10) was about $1500 higher than that of an SHS ($7524.59) ($P = 0.03$). All fractures went on to unite in the SHS group, while 1 (2.4%) progressed to nonunion in the CMN group ($P = 1.00$). Mean time to radiographic healing was 142 days for a CMN versus 132 days for an SHS ($P = 0.92$). There was 1 lag screw cutout in the SHS group (4.2%) and none in the CMN group ($P = 1.00$). There was 1 fixation failure in each group (2.4% CMN, 4.2% SHS, $P = 1.00$). One hip was converted to arthroplasty in the CMN group (2.4%) compared to 2 in the SHS group (8.3%) ($P = 0.55$). No differences were seen with regard to length of stay, blood loss, complications, readmissions, or mortality rates.

Table 1: Outcomes of basicervical hip fracture patients by treatment.

	Short CMN (n=41)	Sliding Hip Screw (n=24)	Total (n=65)	P Value
Inpatient Mortality, n (%)	0 (0.0%)	1 (4.2%)	1 (1.5%)	0.369
30 day Mortality, n (%)	0 (0.0%)	1 (5.0%)	1 (1.9%)	0.370
1 year Mortality, n (%)	2 (6.9%)	1 (5.6%)	3 (6.4%)	1.000
Operative Time, mean ± SD, minutes	49.59 ± 16.54	72.92 ± 19.21	58.20 ± 20.79	< 0.001
Length of Stay, mean ± SD, days	6.29 ± 3.39	7.17 ± 4.01	6.62 ± 3.62	0.236
Need for ICU, n (%)	5 (12.2%)	3 (12.5%)	8 (12.3%)	1.000
Urinary Tract Infection, n (%)	5 (12.2%)	3 (12.5%)	8 (12.3%)	1.000
Acute Kidney Injury, n (%)	4 (9.8%)	1 (4.2%)	5 (7.7%)	0.644
Transfusion, n (%)	11 (26.8%)	7 (29.2%)	18 (27.7%)	1.000
Major complications, n (%)	3 (7.3%)	1 (4.2%)	4 (6.2%)	1.000
Sepsis or Septic Shock, n (%)	1 (2.4%)	1 (4.2%)	2 (3.1%)	1.000
Pneumonia, n (%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Acute Respiratory Failure, n (%)	0 (0.0%)	1 (4.2%)	1 (1.5%)	0.369
Stroke, n (%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Myocardial Infarction, n (%)	1 (2.4%)	0 (0.0%)	1 (1.5%)	1.000
Cardiac Arrest, n (%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
DVT/PE, n (%)	1 (2.4%)	0 (0.0%)	1 (1.5%)	1.000
Discharge Location, n (%)				0.079
Acute Rehab Facility	6 (14.6%)	1 (4.2%)	7 (10.8%)	
Deceased	0 (0.0%)	1 (4.2%)	1 (1.5%)	
Home with Health Services	3 (7.3%)	6 (25.0%)	9 (13.8%)	
Home	4 (9.8%)	4 (16.7%)	8 (12.3%)	
Skilled Nursing Facility	28 (68.3%)	12 (50.0%)	40 (61.5%)	
30 day readmission, n (%)	1 (2.4%)	0 (0.0%)	1 (1.6%)	1.000
90 day readmission, n (%)	4 (9.8%)	1 (4.3%)	5 (7.8%)	0.646
Procedure Costs, mean ± SD, USD	$8,999.10 ± $3,330.80	$6,326.54 ± $3070.81	$7,524.59 ± $3,411.16	0.033
Total Cost of Admission, mean ± SD, USD	$19,862.76 ± $4,942.74	17900.06 ± $10,341.32	18779.89 ± $8,291.44	0.203
Time to Radiographic Healing, mean ± SD, days	142.33 ± 100.10	131.82 ± 83.04	138.72 ± 93.35	0.921
Time to Last Follow-up, mean ± SD, days	162.79 ± 247.98	439.23 ± 402.46	240.91 ± 320.56	0.061
Progressed to Nonunion, n (%)	1 (2.4%)	0 (0.0%)	1 (1.5%)	1.000
Screw Cut Out, n (%)	0 (0.0%)	1 (4.2%)	1 (1.5%)	0.369
Fixation Failure, n (%)	1 (2.4%)	1 (4.2%)	2 (3.1%)	1.000
Conversion to Arthroplasty, n (%)	1 (2.4%)	2 (8.3%)	3 (4.6%)	0.549

Conclusion: Based on these results, there is no difference in the efficacy of implant choice in the treatment of basicervical femoral neck fractures. Factors outside of radiographic, clinical, and quality outcomes, such as cost and surgeon familiarity, should drive implant choice for OTA 31B3 fractures.