

A retrospective comparison of internal fixation versus arthroplasty for femoral neck fractures in non-geriatric patients

PURPOSE

Fixation of femoral neck fractures in non-geriatric patients can be challenging. A recent multicenter study found that reoperations occurred in up to 52% of these patients. In older patients, arthroplasty is the standard of care for displaced femoral neck fractures due to unacceptably high failure rates. Considering the high failure rate in younger patients and the longevity of modern arthroplasty implants, arthroplasty may be the superior treatment option in younger patients as well. The purpose of this study was to compare the major complication rate between arthroplasty and internal fixation of femoral neck fractures in non-geriatric patients. The secondary purpose of this study was to evaluate what variables were associated with failure of fixation of these fractures.

METHODS

A retrospective review of skeletally mature patients less than 65 years old who received surgical treatment for a femoral neck fracture at a level one trauma center between January 1st, 2016 and May 1st, 2024 was conducted. Demographics, treatment, and radiographic characteristics were recorded. Patients undergoing arthroplasty versus fixation were compared in terms of demographics, injury characteristics, treatment, and major complications. Patients undergoing fixation who had failure of fixation were compared to patients who did not.

RESULTS

There were 86 patients included in the analysis. Table 1 shows key comparisons between the arthroplasty and fixation groups. Surgical treatment included hemiarthroplasty in 31.4% (n=27), total hip arthroplasty in 22.1% (n=19), 3 cannulated screws in 21.0% (n=18), femoral neck system in 16.3% (n=14), dynamic hip screw in 5.8% (n=5), a short corticomedullary nail in 1.2% (n=1), a proximal femur locking plate in 1.2% (n=1), and a 90 sliding hip screw plate in 1.2% (n=1). The complication rate was significantly lower with arthroplasty (17.4% (8/46) vs. 47.5% (19/40), p=0.003). Arthroplasty patients were also less likely to require reoperation (13.0% (6/46) vs. 37.5% (15/40) p=0.008). When analyzing only patients who were treated with internal fixation, those who had a healing complication, compared to those who did not, were more likely to have displaced fractures (Garden III and IV) (94% vs. 60.9%, p=0.02) and varus displacement of the head (88.2% vs. 56.5%, p=0.04) on injury radiographs, and did not differ in age, gender, ASA classification, reduction quality, or implant type.

CONCLUSIONS

This study found that arthroplasty, compared to internal fixation, was associated with fewer complications in patients less than 65 years of age with femoral neck fractures. Failure of healing in patients treated with internal fixation was only associated with initial fracture displacement and varus displacement on injury radiographs suggesting that patients with these fracture qualities may benefit from arthroplasty.

Table 1. Comparison of patients treated with arthroplasty versus fixation

	Arthroplasty (n=46)	Fixation (n=40)	Difference (95% CI)	P-value
Age	59.0 (53.0, 62.0)	39.0 (30.0, 54.8)	17.0 (11.0, 22.0)	<0.0001
Male gender	28 (60.9%)	30 (75.0%)	-14.0% (-32.6%, 5.8%)	0.16
Low energy	37 (80.4%)	12 (30.0%)	50.4% (30.1%, 66.3%)	<0.0001
BMI	24.7 (22.0, 27.6)	25.3 (23.7, 28.0)	-1.1 (-2.9, 0.75)	0.20
ASA >2	24 (52.2%)	18 (45.0%)	7.2% (-13.8%, 27.5%)	0.50
Smoker	22 (47.8%)	15 (37.5%)	10.3% (-10.6%, 30.2%)	0.33
Garden 3,4	45 (97.8%)	30 (75.0%)	22.8% (7.5%, 36.5%)	0.001
Follow-up (months)	16.9 (5.9, 30.6)	13.1 (3.5, 34.2)	2.1 (-3.1, 8.1)	0.43
Complication	8 (17.4%)	19 (47.5%)	-30.1% (-47.6%, -10.2%)	0.005
Reoperation	6 (13.0%)	15 (37.5%)	-24.4% (-41.2%, -5.7%)	0.01

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