

Minimally Displaced Femoral Neck Fractures in the Elderly: Is a Simple Pinning Surgery Better Than Hemiarthroplasty?

Jon Hedgecock, MD¹; John Gorczyca, MD¹; Catherine Humphrey, MD²; Kyle Judd, MS, MD¹; Gillian Soles, MD³; John Ketz, MD³

¹University of Rochester, Rochester, New York, USA;

²University of Rochester Medical Center, Rochester, New York, USA;

³University of Rochester Medical Center, Pittsford, New York, USA

Background/Purpose: Minimally or nondisplaced fractures of the femoral neck (OTA 31 B1 and B2) fractures have historically been treated with percutaneous pinning. Hemiarthroplasty and total hip arthroplasty have been reserved for displaced fractures, and have yielded good results with minimal perioperative complications. The current study evaluates and defines the failure rate of internal fixation for nondisplaced or minimally displaced femoral neck fractures in patients older than 60 years of age and attempts to identify radiographic or clinical parameters that may predict treatment failure.

Methods: From January 2012 to January 2015 all OTA 31 B1 and B2 fractures that were treated using either CPT code 27325 (percutaneous fixation) or 27236 (open treatment) were included. Patients younger than age 60, displaced fractures (OTA type 31-B3), and those treated with hemiarthroplasty were excluded. Operative notes for all patients were reviewed in detail to determine the exact operative treatment. If reduction was carried out, the type was noted, as well as presence or absence of operative capsulotomy. Pre- and post-operative radiographs were examined, with preoperative fracture classification, displacement, and angulation noted. Patients' medical comorbidities were recorded. Treatment failure was defined as fracture collapse of >2 cm, implant failure (including screw cutout), nonunion, osteonecrosis, and revision surgery. If revision surgery was performed, the type was noted. Rates of the outcome variables were reported as percentages.

Results: 234 nondisplaced or minimally displaced OTA type 31-B fractures were identified. In 27% of patients a treatment failure was noted. 46% of fractures with treatment failure were those other than the valgus-impacted type (OTA 31-B1). In 43% of treatment failures, angulation <10° was noted on the preoperative lateral radiograph. Fracture collapse was noted in 78% of patients in which a complication was noted. Mean time period between surgery and when complication noted was 5.5 months. Two-thirds of cases with a complication required a revision operation. Revision operations included implant removal (26%), conversion to arthroplasty (41%), and revision reduction and fixation (33%). Individual medical comorbidities were not associated with the presence or absence of a treatment failure.

Conclusion: Elderly patients with nondisplaced or minimally displaced femoral neck fractures treated with internal fixation had a relatively high rate of treatment failure, many of which required revision surgery. In this patient population, it is desirable to minimize the risk of revision surgery, while allowing for immediate postoperative weight bearing. Hip replacement surgery may be a beneficial option in the treatment of these fractures. How-

ever, further studies are needed to elucidate which parameters could potentially be used to predict treatment failure in this patient group.