

Management and Outcomes of Femoral Head Fractures

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Purpose: The purpose of this study was to evaluate the incidence, treatment, and outcomes of femoral head fractures at a high-volume academic Level I trauma center. Previous studies have reported small series of patients with these injuries but information from larger study populations is lacking.

Methods: This study was approved by the IRB at our institution. A retrospective chart review of a prospectively collected trauma database was performed at a single regional Level I trauma center between January 1, 2000 and January 1, 2013. All AO/OTA 31C fractures of the femoral head were identified for review. All fractures were classified by the Pipkin system. Patients with clinical and radiographic follow-up greater than 6 months were included in our evaluation. Patients treated operatively and nonoperatively were included. For patients treated operatively, approach and fixation techniques were recorded. Follow-up patient radiographs were evaluated for failure of fixation (if performed), development of heterotopic ossification, and the development of osteonecrosis or posttraumatic degenerative joint disease at latest follow-up.

Results: We identified 164 fractures in 163 patients. 17 patients were excluded because of incomplete records or radiographs, leaving 147 fractures available for review. The overall distribution in classification was as follows: Pipkin I: 40 (27.2%), II: 62 (42.2%), III: 7 (4.8%), IV: 23 (15.6%); 15 (10.2%) fractures did not fit within the Pipkin classification system. 78 patients (53.4%) were treated with open reduction and internal fixation (ORIF), 37 (25.3%) with fragment excision, 28 (19.2%) patients were treated nonoperatively, and 3 (2%) with hemiarthroplasty. An anterior approach, rectus tenotomy and mini-fragment screws were used in the majority of patients treated with ORIF. 69 fractures in 68 patients had clinical and radiographic follow-up greater than 6 months (mean follow-up 12.4 months). 62 fractures (89.9%) proceeded to union without radiographic signs of failure. All patients were full weight bearing by 3 months. All Pipkin III fractures failed operative fixation. At last follow-up, 6 patients developed radiographic signs of osteonecrosis, and 7 patients went on to hip arthroplasty. Heterotopic ossification developed in 28 (40.6%) patients. Classification was Brooker I in the majority of patients (60.1%).

Conclusion: Fractures of the femoral head are rare injuries. Over a 13-year period, 147 fractures were treated at our institution. The majority of these fractures can be reliably treated with ORIF using mini-fragment screws through an anterior approach. If fragment fixation is not possible, excision can be performed. Pipkin III fractures represent severe injuries that may not be amenable to successful fixation strategies. Nonbridging heterotopic ossification is

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common following operative intervention. Few patients progress to osteonecrosis or joint degeneration that requires later arthroplasty.