

Results of Surgical Repair in Displaced Femoral Neck Fractures in Young Adults: Special Attention on the Effects of Construct Design

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Purpose: The purpose of this study was to assess the results of internal fixation for displaced femoral neck fracture in a population of young adults. Emphasis was placed on the effects of construct design on surgical outcomes.

Methods: This was a retrospective study of displaced femoral neck fractures in young adults (<60 years) at our Level I regional trauma center between January 1, 2005 and December 31, 2015. Collected data included demographics and comorbidities, injury, treatment, surgical outcomes, and complications. Healing was defined as restoration of 3 continuous cortical lines on plain radiographs of the hip (AP and lateral). Femoral neck shortening was measured using serial postoperative AP pelvis radiographs. The injured femoral neck was compared to the contralateral femoral neck using standardized 2-dimensional measurements.

Results: We identified 81 patients who met study criteria and had >6 months follow-up. Mean follow-up was 16 months (range, 6-52 months). Most of our patients were classified as Pauwels type III (74%) or II (26%). The predominant surgical constructs used were compression hip screw and antirotation screw (CHS + AR, 38%) and 3 or 4 cannulated screw fixation (CS, 51%). 11 hips (14%) subsequently developed osteonecrosis (CHS + AR, 16%; CS, 13%), 14 hips (17%) developed nonunion (CHS + AR, 16%; CS, 20%) and had additional surgery (NS). 54 patients had uneventful fracture healing (CHS + AR, 72%; CS, 63%). The femoral neck shortened >5 mm in 80% of patients (CHS, 58%; CS, 93%). The average amount of shortening in CHS + AR and CS fixation was 7.9 mm and 15.3 mm, respectively (P <0.01). Additionally, 14 hips (19%) treated with a fully threaded screw (FTS, length-stable implant) as part of a CHS + AR or CS construct experienced mean shortening of 6.2 mm, while 45 hips (61%) treated without an FTS experienced mean shortening of 14.7 mm (P <0.01). Patients treated with CHS + AR with FTS and CS with FTS experienced 5.1 mm and 5.9 mm of shortening, respectively. Patients treated with CHS and CS fixation without FTS experienced 8.5 mm and 18.2 mm of shortening, respectively.

Conclusion: In a sizable population of young patients treated for displaced femoral neck fractures using a number of modern construct designs, we found overall results as good as those previously published. CHS + AR and FTS as a length-stable implant are 2 effective means we have found that limit femoral neck shortening while allowing for healing in most cases.