

Trabecular Metal Cup-Cage Construct in Immediate Total Hip Arthroplasty for Osteoporotic Acetabular Fractures: A Radiostereometric Analysis Study*Daud Chou, FRCS (Ortho); John Matthew Abrahams; Kerry Costi, BA;**Stuart Adam Callary, PhD; Donald Howie, MD, PhD; Lucian B. Solomon, Faortha, MD, PhD
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Purpose: The management of comminuted, displaced acetabular fractures in the elderly osteoporotic population remains a significant treatment challenge. Advocates of immediate total hip arthroplasty have presented a number of differing technical solutions. Achieving primary stability of the acetabular cup without early migration is challenging and there is no current consensus on the optimum method of acetabular reconstruction. We present clinical results and radiostereometric analysis (RSA) of trabecular metal (TM) cup-cage construct reconstruction in osteoporotic acetabular fractures treated with immediate total hip arthroplasty without acetabular fracture fixation.

Methods: Between 2011 and 2016, 21 acetabular fractures underwent acute total hip arthroplasty with a trabecular metal cup-cage construct. Patient, fracture, and surgical demographics were collected. Patients were followed for a minimum of 24 months. Clinical and patient-reported outcome measures were collected at regular postoperative intervals. RSA was used to measure superior migration and sagittal rotation of the acetabular component.

Results: 13 fractures were classified as anterior column posterior hemitransverse, 2 anterior column, 2 transverse, and 4 associated both-column acetabular fractures. Complications included 1 case of trochanteric fracture, a transient foot drop, and a deep infection. Mean Harris hip scores at 24 months was 79 (range, 33-98). The mean proximal migration of the acetabular components at 24 months was 0.91 mm (range, 0.09-5.12) and mean sagittal rotation was 0.52 mm (range, 0.03-7.35).

Conclusion: TM cup-cage reconstruction of acetabular fractures requires a single approach and provides cup stability allowing immediate full weight bearing. To our knowledge this is the first study to accurately measure cup stability following total hip arthroplasty for acetabular fractures. Our promising early clinical and radiological outcomes, assessed by RSA, suggests that this technique may be an alternative to a fix-and-replace construct and other immediate arthroplasty options for acetabular fractures in osteoporotic bone.