

Trabecular Metal Cup-Cage Construct in Immediate Total Hip Arthroplasty for Osteoporotic Acetabular Fractures

A Radiostereometric Analysis

DTS Chou, JM Abraham, SA Callary, K Costi, R Clothier, DW Howie, LB Solomon

Department of Orthopaedics & Trauma, The University of Adelaide & Royal Adelaide Hospital, Adelaide, South Australia

Introduction

Treatment of acute osteoporotic acetabular fractures with total hip arthroplasty (THA) is gaining popularity. As early migration of an acetabular implant is predictive of its long term survival, new implants and techniques should be introduced in a stepwise manner which includes measurement of their early stability using radiostereometric analysis (RSA).

The objectives of the present study were to use RSA to measure the migration of the porous tantalum acetabular components used in a cup cage construct to treat acute acetabular fractures with THA, and secondarily to present clinical outcomes.

Patients & Methods

Replace in-situ construct was utilized to treat 28 acetabular fractures under the care of one surgeon between Nov 2011- Jul 2017. Our replace in-situ construct ignores the fracture, does not reconstitute the columns but aims to achieve cup stability through pelvic distraction – as in revision THA in cases with massive bone loss and pelvic discontinuity. RSA was performed to a mean follow-up of 3 years (range 2-5 years).

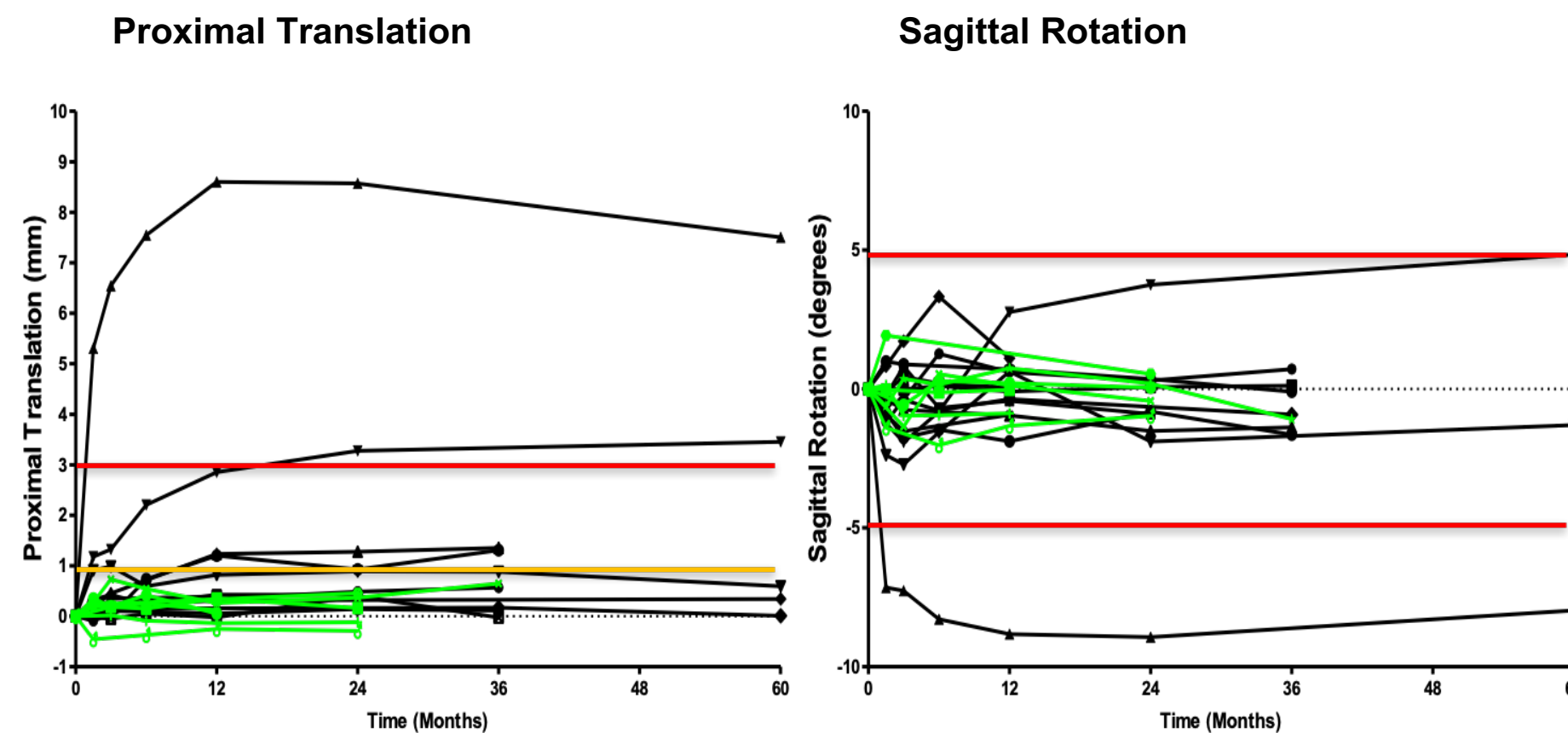
Acetabular fracture types included 1 anterior column, 11 anterior column posterior hemi transverse, 1 T-type and 15 associated both column fractures. Median age = 78 (range 54 – 97). Median Charlson Co-morbidity index = 2 (range 0 – 4). Median ASA grade = 3 (range 1 – 4). 6 patients from nursing homes, 22 community dwellers.

EARLY COMPLICATIONS	Number
Death within 30 days (within 1 year)	1 PE (1 Cancer)
Myocardial infarction	2
Pulmonary embolism	1
Systemic infection (UTI/pneumonia)	5
Wound infection	0
Foot drop	1
Dislocation (recurrent)	2 (1)

LATE COMPLICATIONS	Number
Cup revision	1
Nonunion	0
Heterotrophic ossification	2
Recurrent dislocation	1
Periprosthetic femur fracture	1 (ORIF)
Infection	1 (DAIR)
Other revisions/reoperations	0

Results

Excluding a component revised for infection, no component was revised or considered needing revision on clinical grounds and standard radiographs. However, 4 components migrated over the threshold that predicts later loosening (1mm), while 2 migrated over the thresholds that diagnose a loose implant (3mm or 5°). The majority of the migration occurred within the first 6 weeks. Interestingly no components with ischial and pubic screws migrated above these thresholds.



> 3 mm proximal translation or > 5° sagittal rotation at any time is 100% sensitive and has a PPV 100% to diagnose a loose cup. Abrahams et al. BJJ 2017

Conclusion

RSA is a sensitive and accurate method of measuring migration of porous tantalum components used to treat acute acetabular fractures with a cup-cage construct according to a 'replace in situ' philosophy. The majority of porous tantalum acetabular components in our series had acceptable early migration. Adding ischial and pubic screws further improved acetabular component fixation. Larger comparative studies are required to determine the optimum fixation construct for osteoporotic acetabular fractures in the elderly.