

## **Treatment of proximal humerus fractures in elderly patients: A systematic review of 409 patients**

Antti P. Launonen<sup>1</sup>, Vesa Lepola<sup>1</sup>, Tapio Flinkkilä<sup>2</sup>, Minna Laitinen<sup>1</sup>, Mika Paavola<sup>3</sup>, Antti Malmivaara<sup>4</sup>

<sup>1</sup>Tampere University Hospital, <sup>2</sup>Oulu University Hospital, <sup>3</sup>Helsinki University Hospital, <sup>3</sup>National Institute for Health and Welfare, Finland

**Objective:** The present study assesses the effectiveness of interventions on disability and function in elderly patients with proximal humerus fracture.

**Methods:** We conducted a systematic search of the medical literature for randomized controlled trials and controlled clinical trials from 1946 to 30 Apr 2014. Pre-defined PICOS criteria were used to look through relevant publications. We included randomized controlled trials of 2-4 part proximal humerus fractures in patients over 60 years of age that compared operative treatment to any intervention with a minimum of 20 patients in each group and a minimum one-year follow-up. Outcomes had to be assessed with pain, functional, or disability measures or a quality of life score.

**Results:** After two independent researchers reviewed 777 abstracts, nine publications with 409 patients were accepted for the final analysis. No differences were found between non-operative and operative treatment for any disability and quality of life score or pain in three- and four-part fractures in locking plate group. However significant difference in quality of life score was found in favor for hemiarthroplasty over non-operative treatment in four part fractures. Complications were common in the operative treatment groups.

**Discussion:** Non-operative treatment over locking plate systems and tension-banding is weakly supported but there is a feeble evidence favoring hemiarthroplasty in four part fractures for elderly patients. High complication rates for operative treatments indicate that they are not a gold standard treatment for proximal humerus fractures in patients over 60 years of age. However, the applicability of the current evidence does not cover all treatment alternatives for all patients, and the final decision

should be made in co-operation with the patient. Patients should be informed of the high risk of complications if choosing operative treatment.