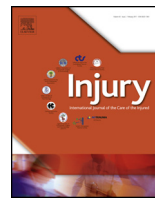




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Does a fixed offset hemiarthroplasty implant have any effect on pain and function in patients with a femoral neck fracture?

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ABSTRACT

Introduction: Hip hemiarthroplasty is the commonest operation performed for a displaced intracapsular hip fracture in the UK. A variety of implants including fixed offset prostheses are utilised. There has been no study investigating the relationship between restoration of femoral offset and long term pain and function. This study aims to evaluate long-term pain and functional outcomes of a fixed offset hemiarthroplasty implant (the Exeter trauma system).

Patients and methods: All patients were retrospectively reviewed from a prospectively collected database. In all, 338 patients met the criteria for evaluation. Patients native offset were calculated from the contralateral hip. Pain and functional outcomes were assessed using validated outcome measures.

Results: There were no differences found across a range of natural offsets for long-term pain and functional recovery.

Conclusion: Our experience with the Exeter trauma system suggests that a 40 mm offset implant is a good standard offset to use.

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Introduction

Hip hemiarthroplasty is currently the commonest form of treatment for a displaced intracapsular hip fracture in the UK [1]. There are a wide variety of prostheses in use, with varying degrees of modularity and offsets. There is current evidence to suggest that offset plays a role in patient pain and function following total hip arthroplasty (THA) [2–5] and another study has examined the relationship between femoral offset and dislocation [6]. To date there have been no studies correlating patient function to offset for any hemiarthroplasty prosthesis. This study evaluates the relationship between a fixed offset hemiarthroplasty implant and patient-reported pain and function.

Patients and methods

All patients were selected from a prospectively collected hip fracture database. 852 patients, who had been treated with an

Exeter Trauma System hemiarthroplasty (ETS) [Stryker, MI, USA] for a displaced intracapsular hip fracture between December 2006 and March 2014, were initially identified from the database. Following exclusion, there were 338 patients left in our cohort (Fig. 1). Exclusion criteria included: patients who had died within the first post-operative year, patients who could not be assessed, or those without one year assessments, patients who had undergone revision of the prosthesis within one year, for complications, patients with an abnormal contra-lateral hip (e.g. THR in situ), patients with missing radiographs and patients with unsuitable radiographs (e.g. other side not included; pelvic tilting).

The ETS has a fixed offset of 40 mm. The natural femoral offset of our patient group was measured from the contra-lateral side using an already described method [2]. The measurements were then corrected for x-ray magnification by calculating from the known diameter of the ETS femoral neck (18 mm, and similar for all the different sizes of the prosthesis). The difference in offset from 40 mm was then correlated with the outcomes of residual pain on a scale of 1–6, from a validated pain score [7], and of residual mobility, from a validated mobility score [8,9] at one year. Both outcome measures were accessed from the prospective database.

Statistical analysis was completed with SPSS 23.0 & 24.0 (IBM). A p value of <0.05 was taken as being statistically significant.

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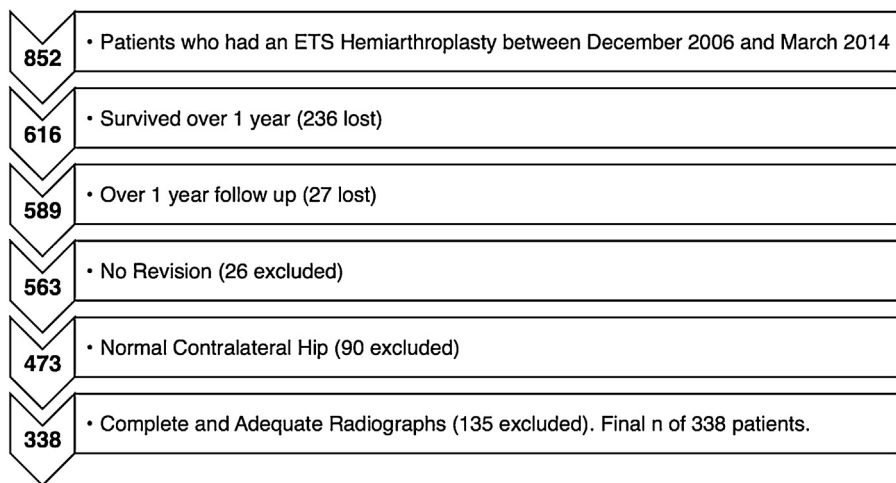


Fig. 1. Flow diagram for selection of patients.

Results

With a total number of 338 patients after exclusions, the mean offset was 40.5 with a standard deviation of 6.4, and it demonstrated a normal distribution (Fig. 2).

Fig. 3 details the mean pain score related to femoral offset. After ANOVA and post-hoc Bonferroni analysis (p = 1 for all ranges) of the offsets when in regard of pain score outcome, there was no significance between the offset in patients with differing pain scores.

The mean reduction in mobility scores related to offset is given in Fig. 4. As a whole the patients all reported a mean improvement in function (±SD) of 0.84 (±2.06). Post-hoc Bonferroni testing again demonstrated no significance difference with regards the improvement in mobility between the femoral offsets (P = 0.67 20–

29 vs 30–39; P = 0.77 30–39 vs 40–49; P = 1 for all other comparisons).

We were not able to relate the femoral offset to the later implant related complications as there were only two patients in this study required additional surgery to the hip within the follow-up period of this study. Both complications were later fracture around the implant treated by plate and wire fixation. The offset for these patients was 30.7 mm and 33.4 mm.

Discussion

This is the first study, as far as we are aware, that has attempted to correlate femoral offset with patient function following a hemiarthroplasty for a displaced, intracapsular hip fracture. The

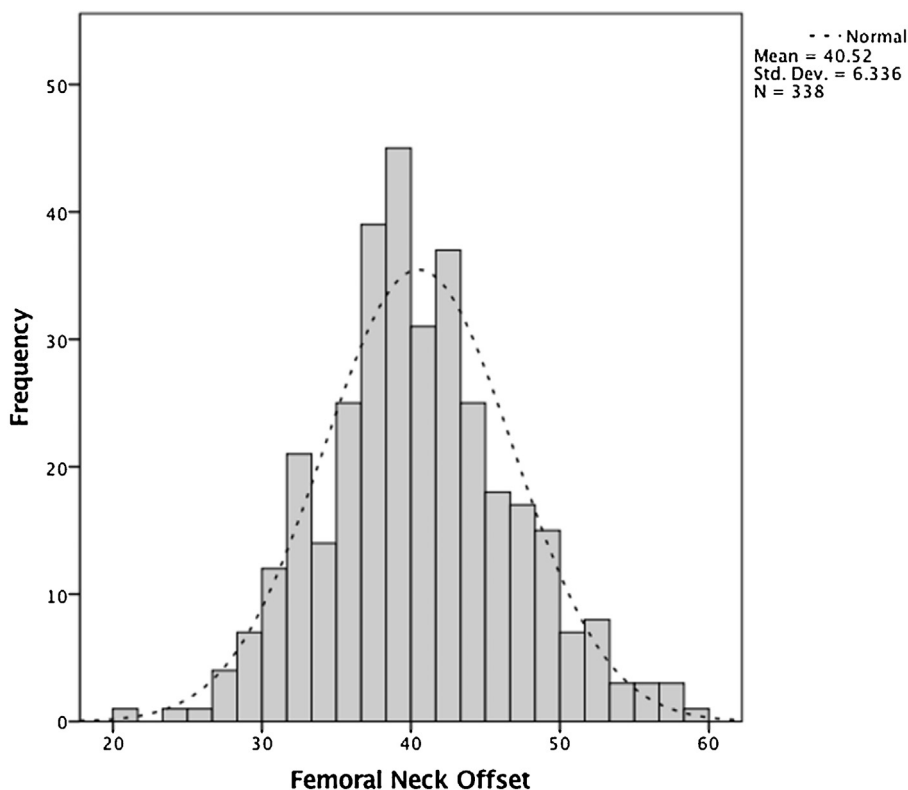


Fig. 2. Femoral offset measured for the contralateral hip.

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