



Medium to long term follow up of a consecutive series of 604 Exeter Trauma Stem Hemiarthroplasties (ETS) for the treatment of displaced intracapsular femoral neck fractures



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ABSTRACT

The aim of this study was to evaluate the medium to long term follow up results for the Exeter Trauma Stem (ETS) in the treatment of displaced femoral neck fractures. We retrospectively evaluated 604 consecutive cemented ETS hemiarthroplasties performed at our institution between 2007 and 2012. The range of follow up was 2–7 years with a mean follow-up of 4.1 years for the surviving patients. The mean age of the patient population was 84 years (range 46–106) with 81.3% female patients. 382 patients (63.2%) died within the follow up period. Postoperative superficial soft tissue infection occurred in 11 patients and deep prosthetic infection in 5 patients. Dislocation occurred in 11 patients and periprosthetic fracture occurred in 7 patients. 11 patients underwent Girdlestone excision arthroplasty and 6 patients were revised to total hip replacement. This paper represents the largest consecutive series for this implant, with the longest follow up currently available. The results confirm that the prosthesis is an excellent implant for these patients with a low risk of needing revision surgery.

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Introduction

Hip fractures are a very common and potentially devastating injury. For many elderly, frail patients they can mean a reduction in their mobility and independence and unfortunately carry a significant mortality risk too. The National Hip Fracture Database figures showed that over 60,000 patients were treated for hip fractures in the UK in the year 2013 [1] and as the population ages, this figure will inevitably rise. Figures show that about half were intracapsular fractures and two thirds of these are displaced. In the United Kingdom, hip fractures account for a large proportion of Orthopaedic bed occupancy, with a total annual cost to the National Health Service (NHS) of approximately £1.5 Billion [1].

The use of a modern cemented hemiarthroplasty stem is recommended by the current United Kingdom Guidance on hip fractures for primary treatment of displaced intracapsular fractures in the elderly or frail [2]. In addition, The National Institute for Health and Care Excellence (NICE) recommends that implants with a proven stem design should be used- i.e. an implant with an Orthopaedic Data Evaluation Panel (ODEP) rating of at least 3B. The Exeter Trauma Stem (ETS) [3] is based on the ODEP 10A

rated Exeter Total Hip Replacement Stem (ETHRS) and is believed to share many of its characteristics [4,5].

The aim of this study was to evaluate the medium to long term follow up results for the Exeter Trauma Stem (ETS). The results of a consecutive series of 604 patients treated with a cemented Exeter Trauma Stem (ETS) hemiarthroplasty are reported. To our knowledge this represents the largest consecutive series of patients treated with the Exeter Trauma Stem currently available.

Patients and methods

We retrospectively evaluated a consecutive series of 604 cemented ETS hemiarthroplasties performed at our institution between 2007 and 2012. All patients received this implant as primary treatment for a displaced intracapsular fracture of the proximal femur, including those with pathological fractures. There were no exclusion criteria.

Data was collected prospectively for all patients on their age, sex, ASA grade, initial hospital treatment and any subsequent operative intervention for the hip, abbreviated mental test scores (range 0–10), mobility scores, residential status, length of stay, complications including revision rate, post-operative pain and mortality.

All surviving patients were initially followed up in a Hip Fracture Clinic at approximately six weeks post discharge from the

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hospital where patients had routine follow up X-rays. All subsequent follow up was via telephone consultation with the patients or their carers, with routine follow up for all patients at one year following the injury. This is routine practice at our unit given the logistical difficulties associated with bringing large numbers of frail, elderly patients to the outpatient clinic. At one year follow up, an assessment of pain, mobility and any further surgery to the hip was made. There was no additional routine follow up, however the General Practitioners were requested to refer patients back to the Hip Fracture Service should there be any subsequent hip complaints.

Final follow up was conducted in October 2014. This was after a minimum of two years post injury (maximum 7 years post injury), and an attempt was made to contact all surviving patients at this time. This follow up was via telephone conversation, once again either with the patients or their carers. Details of any residual hip symptoms, mobility, use of walking aids and residential status and further hip surgery were sought. Any patients who had significant symptoms were offered a review appointment at the Hip Fracture Clinic. Pain was assessed on a scale of one (no pain) to six (constant and severe) [7].

At final follow up, a full review of hospital computer records was conducted for all cases. A note was made of those patients who had died and the date of death was recorded. For those patients with no record of death in the hospital records, the patient, carer/relative or residential/nursing home were contacted. If revision surgery had been undertaken, data was collected on the date, type of procedure and any subsequent complications. For those who we were unable to contact, a letter was sent to the last known address and General Practitioner.

Results

The mean follow up for the surviving patients was 1483 days (4.1 years, range 365–3285 days). Six (1.0%) patients were lost to follow up at a mean of 470 days (range 365–613 days) from fracture. At the time of fracture the mean age of the 604 patients was 84 years (range 46–106). There were 491 female patients (81.3% female). The ASA grade ranged from 1 to 4 (mean 2.7). 469 patients (77.6%) lived in their own home at the time of admission, 96 (15.9%) were in residential care, 24 (4.0%) in nursing homes and the remaining 15 (2.5%) were in an acute hospital. At the time of injury, 289 (47.8%) of patients were independently mobile with no walking aids, 135 (22.4%) required 1 stick, 5 (0.8%) required 2 sticks, 167 (27.6%) required crutches or a zimmer frame and the remaining 8 (1.3%) were either wheelchair or bed-bound.

The length of surgery ranged from 30 to 190 min with a mean time of 70.6 min. 423 (70.0%) of the procedures were performed by consultants and the remaining 181 operations (30.0%) by sub-consultant grade surgeons. 507 procedures were performed with a modified anterolateral approach to the hip [6], 92 were a posterior approach and five an anterior approach. The mean length of stay on the acute orthopaedic ward was 12.5 days (range 1–99 days) and the mean total length of stay which included any time on other wards or rehabilitation units was 19.0 days (range 1–235 days).

There were 16 (2.6%) cases of post-operative wound infection. 11 of these were superficial wound infections, all of which responded to antibiotic treatment and did not require further surgical intervention for the infection. Five (0.8%) patients developed deep infection. One of these patients was treated with antibiotics only, two underwent drainage of the infection followed by Girdlestone resection arthroplasty, one patient underwent Girdlestone procedure as definitive treatment and one patient underwent Girdlestone procedure followed by subsequent total hip arthroplasty. All patients who underwent surgical treatment

for deep prosthetic infection also received antibiotic treatment as an adjunct.

Dislocation occurred in 11 (1.8%) patients and periprosthetic fractures around or below the level of the prosthesis occurred in 6 (1.0%) patients. All the periprosthetic fractures underwent open reduction and internal fixation. Acetabular fracture occurred in one patient who subsequently underwent Girdlestone resection arthroplasty.

Table 1 shows the breakdown of all the implant related complications and further intervention. A total of 24 patients had 33 re-operations. (One patient had three further procedures, seven patients had 2 re-operations and 16 patients had one re-operation). 16 (2.6%) patients required revision or removal of the prosthesis. Fig. 1 shows the rate of revision surgery at final follow up.

382 (63.2%) of the 604 patients had died within the follow up period. The 30-day mortality was 39 (6.5%) and the one year mortality was 177 (29.3%) patients. Fig. 2 shows patient survival at final follow up.

The mean pain score for 216 patients at final follow-up was 1.6, that is on average, at final follow up patients reported either no pain or only occasional, slight pain (range 1–6). Four patients described pain of a regular occurrence requiring frequent analgesia. At final follow up, 154 (71.3%) patients were living in their own home, 44 (20.4%) were in residential care, 15 (6.9%) in nursing homes and the remaining 3 (1.4%) were in an acute hospital. 92 (42.6%) of patients were independently mobile with no walking aids, 31 (14.4%) required 1 stick, 2 patients (0.9%) required 2 sticks, 71 (32.9%) required crutches or a zimmer frame and the remaining 20 (9.3%) were either wheelchair or bed-bound.

Discussion

The Exeter Trauma Stem Hemiarthroplasty (ETS) is based on the Exeter Total Hip Replacement stem which has an Orthopaedic Data Evaluation Panel rating of 10A. The use of the monoblock ETS has been largely confined to the United Kingdom since its introduction

Table 1

A breakdown of all implant-related complications.

Complication	Number of patients	Intervention
Superficial infection	11	No re-operation—all resolved on antibiotics
Deep infection	5	1 Girdlestone 1 Girdlestone then THR 1 antibiotics only
Dislocations	11	2 drainage then Girdlestone 1 left un-reduced (found at follow up) 1 reduced closed (on 2 occasions) 1 reduced closed then required open reduction 1 reduced then Girdlestone 1 reduced closed then revised to THR then Girdlestone 4 Girdlestone 2 revised to THR (one of these patients subsequently dislocated, requiring closed reduction of THR)
Hip subluxation	1	On follow up X-rays—not treated
Fracture around/below prosthesis	6	6 internal fixation
Acetabular wear	5	3 THR 2 On X-rays—no intervention required at present
Acetabular fracture	1	Girdlestone

THR=Total hip replacement.

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