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Clinical Outcomes of Total Hip Arthroplasty for Fractured Neck of Femur in Patients Over 75 Years

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ABSTRACT

To date, there has been little research into the clinical outcomes of total hip arthroplasty (THA) for intracapsular neck of femur (NOF) fracture in the very elderly. 44 patients over 75 years underwent THA for an intracapsular NOF fracture over a two year period. Oxford Hip Scores were obtained from 37 patients with a mean score of 39.7 (range 11–47). Katz Index Scores were collected from 36 patients with a mean pre-operative score of 5.9 and post operative score of 5.7. THA in this population gives patients the best opportunity to return to premorbid function. When complications occur there is a catastrophic effect on independence. Therefore it is important to select these patients' appropriately and to optimise their medical condition peri-operatively.

Global numbers of hip fractures were reported as 1.3 million in 1990 and could be up to 21 million by 2050 [1] with a lifetime risk reported as 23.3% for women and 11.2% for men [2]. It is the commonest cause of injury related death and is therefore a major health issue. This is reflected in the number of guidelines published on hip fractures [3–5]. The incidence of hip fractures in New Zealand is equivalent to most European and North American countries with approximately 4000 hip fractures per year, and a total cost of $105 million NZD for their care [4,6]. Mortality at one month is 10% and at one year is 30%. Hip fractures also carry a high morbidity, thus representing a significant health issue [7].

The choice of treatment should be determined based on the degree of displacement and the patient's clinical and functional pre-morbid status. Conservative management is usually reserved for the moribund patient showing increased 30 day mortality compared to operative treatment [8]. Internal fixation is useful in young patients, regardless of displacement, in order to preserve the native hip joint [9–11]. However in elderly patients there are multiple studies showing superiority of arthroplasty over internal fixation [12–16]. The outcomes of salvage total hip arthroplasty (THA) after failed internal fixation are worse than primary THA [17]. Following internal fixation there is a median risk for reoperation of 35% at 2 years [18]; therefore arthroplasty should be considered in elderly patients to prevent reoperation.

In patients with low functional demands hemiarthroplasty is the treatment of choice [10] but there are many good studies that recommend THA over hemiarthoplasty for patients with higher demands [19–21]. These studies show equivalent outcomes to THAs performed for other reasons [22,23]. There are multiple national guidelines that recommend THA in patients who sustain a displaced intracapsular neck of femur fracture, are able to walk independently, are not cognitively impaired and who are otherwise medically fit [3,5,24]. Despite the evidence in support of THA for hip fracture it remains controversial with most orthopaedic surgeons recommending hemiarthroplasty for the more elderly patients regardless of their pre-morbid function [10].

With our ageing population we are beginning to see more patients who fulfil the criteria for THA but there is limited literature relating to the outcome of THA in the over 75 year olds. Kieffer et al [25] looked at morbidity and mortality in patients over 80 but there are no studies looking at clinical outcomes in this specific age group. Instead, most studies look at all ages. It must be recognised that elderly hip fracture patients are a unique group and data from younger patients cannot always be extrapolated. In a recent meta-analysis Hopley et al [26] recommended THA over hemiarthroplasty but it was noted that there was significant heterogeneity amongst the groups studied and that more research was required into specific subgroups. A further study in 2012 looking at the United Kingdoms National Hip Fracture Database recommended further research into the benefits of THA in older patients and those with an American Society of Anaesthesiologists (ASA) grade of more than 2 [27].

It is therefore the aim of this study to look at the clinical and functional outcomes of THA for intracapsular hip fracture in patients aged over 75 with a minimum of twelve months follow-up.

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Patients and Methods

Institutional review board approval was obtained for this retrospective cohort study. The criteria for inclusion were a displaced intracapsular fracture treated with THA and age over 75 years at the time of injury. Our institution offers THA in line with other guidelines [3]. Patients who have sustained a displaced intracapsular fracture and who are able to walk independently outdoors, are independent with activities of daily living, are not cognitively impaired and who are medically fit for the anaesthesia and procedure are offered THA. Each patient being considered for THA underwent medical review and clearance by an anaethetist prior to surgery including but not limited to baseline blood results, electrocardiograph and chest radiograph. Inclusion criteria for this study were age over 75 years at time of injury, having a displaced intracapsular fractured NOF and undergoing a THA.

All patients admitted to Waikato Hospital with a neck of femur fracture between July 2011 and July 2013 were identified using the hospital electronic patient record (Clinical Results Viewer, iSOFT Health). A total of 558 patients were admitted to Waikato Hospital with a fractured neck of femur over the two year study period. Of these, 435 (78%) were over 75 years of age and 277 (50%) were intracapsular. 44 of 435 patients (10%, 30 female) qualified for THA and therefore fulfilled the inclusion criteria for this study (mean 83 years, range 75–95 years) (Fig. 1). 2 patients were unable to be contacted having moved overseas and 5 patients died before clinical follow-up leaving a total of 37 patients with complete radiological and clinical follow-up (mean 18 months, range 12–31 months). The mean ASA score was 2.7 [28] (Fig. 2).

All patients were under the care of a consultant orthopaedic surgeon and were operated on a dedicated trauma list with the component selection made by the consultant in charge of care. Operations were performed by a consultant or senior trainee with 38 patients (86%) having an anterior approach and 6 a posterior approach based on surgeon preference. 24 patients had cemented Exeter stems (Stryker, USA) and 21 had cemented Spectron stems (Smith and Nephew, Memphis, USA). 38 had uncemented R3 cups (Smith and Nephew, Memphis, USA) and 6 had Exeter contemporary cemented cups (Stryker, USA). Vacuum mixed Simplex cement (Stryker, USA) with tobramycin was used in all cemented cases with pulsatile lavage wash, distal cement restrictor and proximal seal whilst pressurising. Patients received pre operative and post operative cefazolin antibiotic prophylaxis along with multidisciplinary (MD) input and aspirin for venous thromboembolism (VTE) prophylaxis as per departmental protocol. Patients were allowed to fully weight bear immediately post-operatively and were followed in routine outpatient clinics at six weeks and one year both clinically and radiographically. Patients requiring further rehabilitation prior to discharge were transferred to a specialised ward within the hospital.

Complications relating to the hip, general complications, activities of daily living (ADL) status, living conditions and hip function, were all recorded. Hip complications included dislocations, infection, hip pain, peri-prosthetic fracture, and loosening of components. General complications included pressure sores, pulmonary, cardiac, and cerebral thromboembolic events. ADL status was measured using the Katz Index retrospectively and post-operatively. The Katz Index uses six questions relating to bathing, dressing, toileting, transferring, continence and feeding with a score of six indicating independence [29,30] (Appendix A). Living conditions were described as independent (living at home), partially independent (living in housing for the elderly), or dependent (living in institutional care). Mortality was divided into 30 day and one year mortality. Hip function was measured using the Oxford Hip Score (OHS), which is a validated [31] patient reported outcome score specific to the hip joint, designed to minimise the influence of comorbidity. Scores range from 0 to 48 with improving joint function indicated by a higher score.

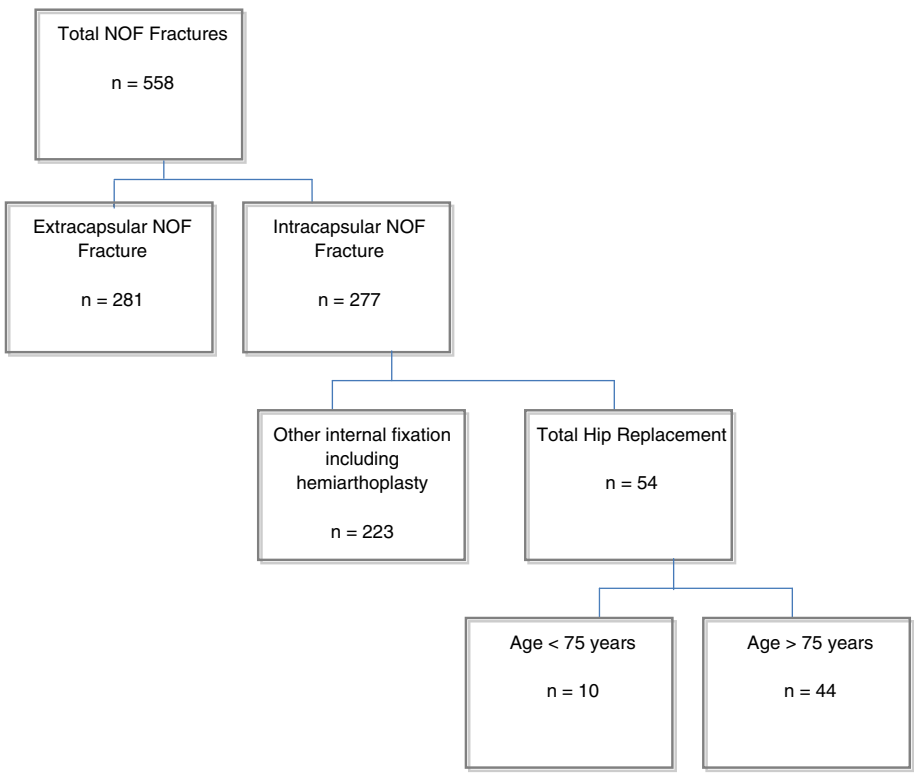

Fig. 1. Caseload of fractured neck of femur patients, June 2011 to July 2013.