

Primary Collared Uncemented Total Hip Arthroplasties in the Elderly: A Safe and Reliable Treatment Option



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ARTICLE INFO

Article history:

Received 6 August 2014

Accepted 5 October 2014

Keywords:

primary total hip arthroplasty
uncemented total hip arthroplasty
octogenarian
nonagenarian
collared femoral prosthesis

ABSTRACT

The age of patients undergoing primary Total Hip Arthroplasty (THA) remains fairly constant despite an increasingly elderly population, possibly owing to concern over postoperative complications. This study evaluated 90-day outcomes in patients over 80, undergoing uncemented collared primary THA for osteoarthritis in a high volume unit. Data were recorded from 153 consecutive patients. There were 0.65% mortality rate and 1.3% major systemic complication rate. American Society of Anesthesiologist (ASA) grade was an independent predictor of inpatient complications. Mean preoperative and 90-day postoperative Oxford Hip Score was 24 and 46 respectively. No radiological evidence of femoral stem migration was seen. Our cohort shows low morbidity and mortality rates. ASA not age helps predict inpatient complications. Uncemented collared femoral prosthesis resulted in excellent functional and radiological outcomes.

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Within Western Society there continues to be an increase in the population of octogenarians and nonagenarians, with those over the age of 85 years the fastest growing group in England and Wales [1]. The number of primary Total Hip Arthroplasties (THAs) has been steadily increasing over the past few decades internationally [2–5]. Those over 85 years of age are as willing as younger cohorts to undergo surgery and gain as much function and pain relief following surgery [6]. Despite this however, studies have found the mean age of patients undergoing THA to be fairly constant or even falling [2,3]. This may reflect a hesitancy to perform major elective surgery on older patients out of concern of co-morbidities and of higher rates of post-operative complications [6–8].

Uncemented femoral prosthesis can undergo complications within the short term with regards to subsidence of the femoral stem, loosening with fibrous ingrowth at the bone–implant interface and a risk of periprosthetic fracture before bony ingrowth has occurred [9,10]. Theoretically this risk is increased within the elderly population who have decreased bone density and bone strength and therefore have a greater risk of bony expansion around the femoral prosthesis [11]. Within this cohort (>80 years of age), a collared uncemented femoral component is routinely used at our unit to mitigate these short term risks and allow for early mobilisation [12].

The objective for this study was to evaluate the 90-day complication rate in the elderly population undergoing uncemented collared primary THA for osteoarthritis within our single surgeon unit.

Materials and Methods

Over a period of 60 months, data from a consecutive cohort of patients over the age of 80 years and operated on by a single surgeon were recorded. Only primary THAs done for osteoarthritis were included in the study.

After being preoperatively accessed by both a Consultant Physician and Consultant Anaesthetist, all patients were operated on by a single, high volume Consultant Hip Surgeon (SMA) using a mini posterior approach. The THA was carried out under general anaesthesia or spinal epidural. Uncemented collared femoral components were used in all patients. Two types of collared prosthesis were used (Corail, Depuy and Profemur Gladiator, Wright Medical). The choice of femoral prosthesis was determined during preoperative planning based upon patient anatomy with the Profemur Gladiator stem chosen for short femoral necks on templating. All acetabular cups were uncemented.

Patients had a drain placed that was removed 24 h postoperatively. Thromboprophylaxis was administered with TED stockings, intermittent compression device and enoxaparin given daily as an inpatient. Antibiotics were given on induction and 2 doses postoperatively. Post-operative bloods and check radiograph were taken on the first day after surgery and all patients were mobilised either on the day of surgery or day 1 postoperatively fully weight bearing. On discharge prior to June 2009 all patients were discharged with a daily dose of 75 mg aspirin for

The Conflict of Interest statement associated with this article can be found at <http://dx.doi.org/10.1016/j.arth.2014.10.004>.

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<http://dx.doi.org/10.1016/j.arth.2014.10.004>

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4 weeks. Our protocol changed after this date, with patients discharged to take Rivaroxaban for 4 weeks.

Patient demographic data together with the preoperative American Society of Anesthesiologist (ASA) grade were recorded. The inpatient length of stay and complications over the first 90 days were recorded along with any readmissions within this time period.

Antero-posterior radiographs were taken on day one post-operatively and at follow-up at 30 days and 90 days. Radiographs were assessed by 2 evaluators (SMA & GS) for prosthesis position, fracture and subsidence with follow-up radiographs compared against the radiographs taken day one post-operatively.

Intraoperative fractures and their treatment were recorded. The incidence of postoperative complications was categorised into major and minor systemic and local complications using divisions described in previous studies [7,13]. Systemic complications were subdivided into cardiovascular, neurological, pulmonary, urinary, fluid and electrolyte imbalances and general complications. Local complications were subdivided into dislocations, fractures, soft tissue infection and wound haematoma. Statistical analysis using IBM SPSS (Version 21) software was undertaken using Spearman's Correlation Test to correlate variables against complication rates with significance attributed at the 0.05 level. For any single variable demonstrating a significant correlation, a multivariate logistical regression analysis was undertaken. Variables assessed were patient age, gender, ASA grade, femoral component, acetabular component and femoral head component material.

Oxford Hip Scores were recorded for all patients preoperatively and at 90-day follow-up.

Results

153 patients were used in this study with no patients lost to follow-up. The mean age of patient was 84.5 years (range 80–95 years). There were 33 males and 120 females within the cohort.

Fig. 1 outlines the percentage of major systemic co-morbidities within the cohort. Median ASA was 2. Fig. 2 outlines the percentages of the ASA grades within the cohort. The mean length of stay was 5.8 days ($n = 148$, range 3–12 days).

142 patients (93%) underwent THA under General Anaesthesia (GA) with 11 patients (7%) having Spinal Anaesthesia. 144 patients had Corail femoral components with 9 patients having Profemur Gladiator femoral stems.

Mean preoperative Oxford Hip Score was 24 ($n = 148$, range 4–41) and 90-day postoperative score was 46 ($n = 145$, range 9–48).

45 patients (29%) required further medical investigation prior to surgery following review by the Consultant Physician; 4 patients had

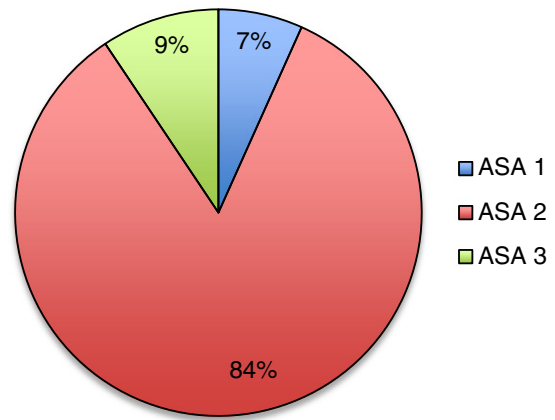


Fig. 2. Percentage of ASA grades represented within the cohort.

their surgery postponed whilst they were medically optimised before undergoing surgery. A further 2 patients did not undergo surgery as their risk of severe morbidity or mortality, both secondary to significant cardiovascular disease, was deemed too high by the Consultant Physician in consultation with the Anaesthetist.

There were 2 Greater Trochanteric fractures sustained intraoperatively with 1 treated conservatively and 1 with tension band wires. All patients were mobilised fully weight bearing postoperatively.

Table 1 outlines the complications over the first 90 days postoperatively. Of note two falls sustained within 30 days resulted in a greater trochanteric and periprosthetic fracture both requiring surgical fixation. At 90 days, there was 1 dislocation as a result of a fall and acetabular fracture with cup migration, with the patient undergoing revision total hip arthroplasty. Prior to this, at 30-day follow-up, the cup was well fixed with no acetabular fracture observed.

There was a significant correlation between ASA and the inpatient complication rate (Spearman's Correlation $P = 0.017$). No correlation was found in the cohort between any variable and overall 90-day complication rate. Logistical regression analysis demonstrated that ASA grade independently predicted in-patient complications. Increasing the ASA by 1 grade increased the likelihood of developing an inpatient complication by 4.34 times.

Discussion

Whilst studies have demonstrated that outcomes of the elderly are equal to their younger counterparts when undergoing THA, it comes at the expense of a greater complication risk [6,7,13–15]. This study demonstrates an overall complication rate lower than previous studies done on a similar, elderly cohort of patients. Recent studies have focused on inpatient complications within the elderly population following THA [8,14,16,17]. Our study demonstrates a 3.9% inpatient major systemic complication rate with no major local complications. There was a 7.2% minor systemic complication rate and 0.65% minor local complication rate as inpatients. In studies that report inpatient complications, rates range from 12.5% to 48% with local complication rates ranging from 1% to 19%. To our knowledge, few studies document detailed inpatient complication rates specifically in the elderly cohort (>80 years of age) [8,14,17–19].

Over the 90 day follow-up period there were a 4.6% overall major systemic complication rate and a 1.3% major local complication rate. The only study to report 90-day morbidity rates was in a cohort of patients including total hip and knee primary arthroplasties between 65 and 94 years of age [20]. This study showed a local complication rate of 19% and major complication rate of 11%.

The mortality in our cohort was 0.65% at 90 days. Hunt et al recently published data on 409,096 patients that showed a mortality rate of 1.35% in the over 80-year age group undergoing elective THA.

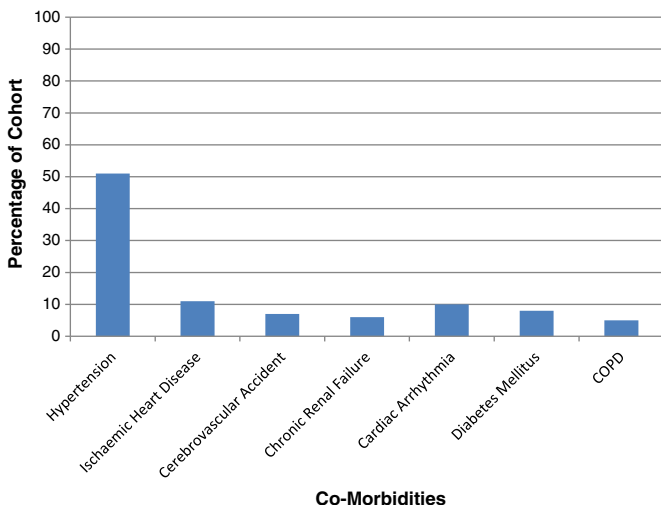


Fig. 1. Major systemic co-morbidities of the cohort.

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