

# Thompson hemiarthroplasty of hip: Is cement an essential ingredient?

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## Abstract

**Introduction:** Thompson hemiarthroplasty of hip for fractured neck of femur is traditionally done with cement to improve stability of fixation. Thompson prosthesis was designed originally to be used without cement. It has now become a routine practice to cement this prosthesis in most centres. In our department most elderly patients with a fractured neck of femur are treated with an uncemented Thompson prosthesis. Cement is used only if the prosthesis appears unstable at any stage of the operation. **Materials & Methods:** We audited all thompson hemi-arthroplasties performed over a year with a minimum follow up of a year. **Results:** In hospital mortality was 9.5% and 1 year mortality was 47.6%. Prosthesis survival at end of first year with revision as end point was 100%. We found acceptable complication rate in these patients; respiratory infection (19%), cardiac failure (6%). The rate of dislocation (1.5%) and deep infection (3%) were low as well. Intra-operatively plan was changed and 5 prostheses were cemented because of obvious loose fit. **Conclusions:** We conclude that cement is not an essential ingredient in Thompson hemiarthroplasty. Along with the obvious reduction in cost, a low revision rate in contrast to general belief makes it an even more attractive option in these elderly patients.

## INTRODUCTION

Thompson and Austin- Moore prostheses are the routine options in most orthopaedic units for hemiarthroplasty in treatment of displaced, osteoporotic intra-capsular fractures of neck of femur [1]. Austin-Moore prosthesis is usually inserted without cement and Thompson with cement. Thompson prosthesis was originally designed to be used without cement fixation [2] but over practice has changed and cemented procedure has become nearly routine [3]. The immediate stability of fixation in femur allows early weight bearing but the cement brings along with it potential complications, even though fortunately rare [4].

Many surgeons including our department continue to use Thompson prosthesis without cement as well [5]. We decided to review our practice to find out whether this was acceptable practice in view of wide practice of cementing.

## METHODS

All Thompson hemiarthroplasties performed between July 2004 and June 2005 at our hospital were reviewed and uncemented procedures were identified. Out of a total of 78 Thompson hemiarthroplasties performed over this period, 66 were uncemented. 7 patients were planned for a cemented

Thompson based on surgeon preference and in 5 patients plan had to be changed intra-operatively because the uncemented prosthesis appeared loose before or after reduction.

Out of these 66 patients, patient and prosthesis survival at one year could be traced in a total of 63. Information on pre-injury residence, pre-injury mobility, post-operative mobility, discharge destination, details of anaesthesia and surgery, duration of stay in hospital, medical complications, infection, dislocation, and any revision surgery done were collected and analysed. Patient survival at one year was checked from either case notes or by contacting patient / next of kin or general practitioner. All patients who were alive were queried about any residual hip or thigh pain and whether they had any revision surgery. Radiographs were not reviewed as part of this study.

The results were tabulated and analysed. Where statistical analysis was needed, P value of <0.05 was taken as statistically significant.

## RESULTS

Out of a total of 63 patients 48 were females and 15 males (3:1). Mean age was 83.5 years (Range 74 to 99). Six

patients died while in hospital after surgery (In-hospital mortality 9.5%). 3 months mortality was 17.5%; 6 months mortality 35% and 1 year mortality 47.6%. Men had 73% mortality at 1 year and women had 40%.

Patients who were community ambulators (Table 1) and who came from own home (Table 2) had lower 1 year mortality. 19% patients had respiratory infection in the postoperative period (Table 3). ASA grade 4 had the highest mortality rate (83%) as expected from their general condition (Table 4). Patients who were operated within first 24 hours had lower mortality (Table 5).

**Figure 1**

Table 1 : Pre-injury mobility and Mortality

Pre-op mobility	Number	Dead at one year
Community ambulator	12	41.6%
Household ambulator	48	50%
Bed to chair only	3	33.3%

**Figure 2**

Table 2 : Pre-injury residence and Mortality

Pre-injury residence	Number	Dead at 1 year
Own home	47	42.5%
Sheltered accommodation	5	60%
Residential Home	3	66%
Nursing Home	8	62.5%

**Figure 3**

Table 3 : Medical complications and Mortality

Complications	Number	Dead at 1 year
Chest infection	12 (19%)	58.3%
Cardiac failure	4 (6.3%)	75%
Renal failure	4 (6.3%)	25%
Pulmonary Embolism	3 (4.8%)	66.3%

**Figure 4**

Table 4 : ASA grade and Mortality

ASA grade	Number	Dead at 1 year
1	2	0%
2	26	46.2%
3	29	44.8%
4	6	83.3%

**Figure 5**

Table 5 : Delay in surgery and Mortality

Delay in surgery	Number	Dead at 1 year
<24 hrs	34	35.3%
24-48 hrs	13	84.6%
> 48 hrs	16	43.8%

**DISCUSSION**

Thompson hemiarthroplasty is preferred by British orthopaedic surgeons for treatment of fractured neck of femur [1] and most use it cemented. This involves extra cost in terms of operating time and actual cost of cement and a more difficult revision in this unfortunate scenario. It adds to the stiffness of the implant in the femur transferring all shear forces to hip joint and thereby making it more vulnerable to dislocation [6]. Even though occasional respiratory complications have been observed after use of cement in hemiarthroplasty [4] use of cement has not been shown to increase the mortality in these patients [7]. Faraj and Branfoot [5] reported similar outcome following uncemented Thompson hemiarthroplasty comparable to cemented Thompson, still use of cement appears to be widespread. As one mix of bone cement costs £ 90, it saves about £ 6000 to our hospital every year. Annual incidence of hip fractures in United Kingdom [8] is 84,000 and assuming that 25,000 out of these get managed by a hemiarthroplasty the projected savings seem to be encouraging.

Our cohort excluded patients who had cannulated screw fixation for undisplaced fractures and patients with displaced fractures who were biologically younger & received a bipolar or total hip replacement. This should explain the higher mortality observed in our series compared that quoted usually in literature. We had one dislocation in our series (1.5%). This is in conformity with literature which quotes lower dislocation rate for uncemented prosthesis [6]. Uncemented prostheses have been shown to increase risk of periprosthetic fractures [9], but this seems to be more common with Austin- Moore prosthesis. None of our patients had an intraoperative or postoperative periprosthetic fracture. Patients who had a chest infection (58%) or cardiac failure (75%) in the postoperative period had higher mortality as previously observed in literature [10]. Patients who had surgery within 24 hours had lower mortality (35.3%) than who were operated after 24 hours and this was statistically significant ( P value 0.03 ) Beyond 48 hours the mortality came down to 43%, probably because most of these patients had their medical condition optimized before surgery.

Three of our patients had some discomfort or pain from either thigh or hip, but none of them considered this to be significant enough to need further surgery. Revision rates after hemiarthroplasty are usually low (5%) and most patients do not have any significant symptoms from the hip [11]. Even for patients who are likely to need revision in future, having an uncemented prosthesis has not been shown to increase the difficulty of surgery or risk of complications [12]. A longer follow-up might have shown more reliable indication on prosthesis survival. But over the years that uncemented prostheses were being inserted, very few patients had undergone a revision surgery at our hospital or had to be referred elsewhere for the same.

## CONCLUSIONS

We conclude that cement is not an essential ingredient in Thompson hemiarthroplasty and along with the obvious reduction in cost; reduced revision rate makes it an even more attractive option in these elderly patients.

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