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Research Article

Cemented or uncemented hemiarthroplasty for displaced intracapsular femoral neck fractures

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Abstract

Hemiarthroplasty is a commonly done treatment for displaced fractures of the femoral neck in the elderly and is associated with better functional outcome and fewer reoperations than internal fixation. A large number of prostheses have been used with or without cement and no definite conclusions have been made regarding which type of arthroplasty is preferred. We performed a randomized controlled trial in 100 cases of intracapsular fractures of the neck of femur in patients above the age of 60 years, comparing hemiarthroplasty using cemented bipolar prosthesis with uncemented bipolar prosthesis. In present study, the mean Harris hip score was found to be 87.9 with an average of 89.25 in cemented group and 83.5 in uncemented group. Average time for full weight bearing was 6.45 days with an average of 7.55 days in uncemented group and 5.35 days in cemented group. In Indian population, cemented bipolar hemiarthroplasty is better treatment option in elderly patients with intracapsular fractures of the neck of the femur, as they have better Harris hip score & reduced time for full weight bearing.

Keywords: Cemented, Uncemented, bipolar prosthesis, hemiarthroplasty

1. Introduction

Fractures of neck of the femur have always presented great challenges to orthopaedic surgeons. They are also associated with a lot of co-morbid conditions like hypertension, cardiac problems, diabetes and dementia. This combined with prolonged immobilization due to fractures leads to increased morbidity and mortality.[1] Hence early mobilization after hemiarthroplasty is necessary in intracapsular neck fractures.

Undisplaced intracapsular hip fracture is almost invariably treated with internal fixation.[2] However; most of the fractures are displaced and occur predominantly in elderly female patients. Bones are osteoporotic in elderly patients. Despite the ubiquitous nature of these fractures, there is still a surprising degree of variation in treatment.[1,2] Hemiarthroplasty is the most common treatment for displaced fractures of the femoral neck in the elderly and is associated with better functional outcome and fewer reoperations than internal fixation.[2] A large number of prostheses have been used with or without cement and no definite conclusions have been made regarding which type of arthroplasty is preferred.[2,3] There is some evidence of inferior short-term results, with decreased mobility and more pain when using an uncemented implant and concerns regarding fixation problems with uncemented stems in osteoporotic bone have been raised.[2,3]

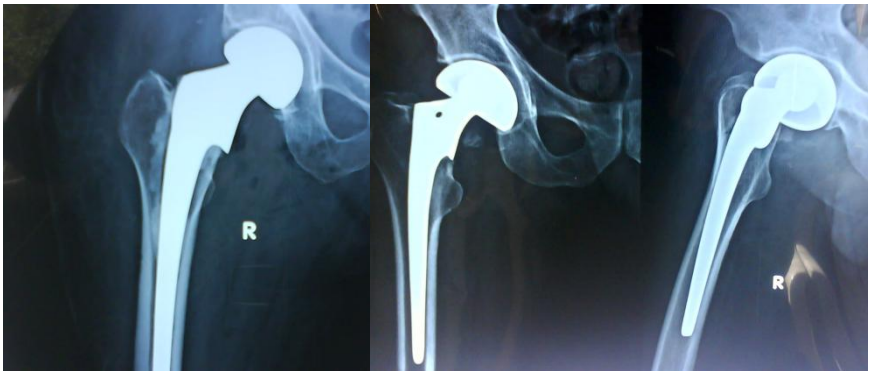
The bonding between prosthesis and femur is dependent upon bony in-growth when cement is not used whereas in cemented prosthesis, cement forms a solid bond between prosthesis and femoral bone. The advantages of cementing are a less post-operative mid thigh pain, as the prosthesis is firmly fixed within the femur and a reduced long term revision rate from loosening of the prosthesis.[3] Major side effects of cement are cardiac arrhythmias and cardio-respiratory collapse, which occasionally occur on application. These potentially fatal complications are caused either by embolism from marrow contents forced into the circulation or by a direct toxic effect of the cement.[4] Another major disadvantage of a cemented prosthesis is that revision arthroplasty will be more difficult.

This study aims at comparing hemiarthroplasty using cemented bipolar prosthesis with uncemented bipolar prosthesis in elderly patients with intracapsular fractures of the neck of femur.

2. Materials and Methods

This study is a prospective randomised clinical study which included 100cases of displaced intracapsular fractures of the neck of the femur in patients above the age of 60years who were ambulating normally before fracture and mentally healthy and co-operative. Pathological fractures and mentally unhealthy patients were excluded from the study. By simple randomisation, fifty patients were treated by hemiarthroplastyusing cemented bipolar prosthesis and the other fifty cases by uncemented bipolar prosthesis. Once the patient was admitted to the hospital, all the essential information was recorded in the proforma prepared for this study. All patients were operated by post lateral approach and given deep vein thrombosis prophylaxis. Intraoperative patients' diastolic blood pressure and oxygen saturation was monitored by anaesthetist while cementing.The follow-ups were done at regular intervals of 1, 3, 6 and 12 months postoperatively and results were tabulated as per modified Harris Hip Score. Descriptive and inferential statistical analyses were carried out in the present study with Student t test (two tailed, independent), inter group analysis on metric parameters. Chi-square/ Fisher Exact test were used to find the significance of study parameters on categorical scale between two or more groups. Ethical clearance was obtained from our institutional ethics committee.

Fig 1: Radiographs of Cemented and Uncemented hemiarthroplasty



3. Results

In present study, most patients were in age group of 65-69 years with mean age of 66.5 years with majority (70%) of them showing a fracture of left hip. We have found 77% patients having garden type 3 fracture. Eighty eight percent patients had co-morbid conditions among which hypertension was the commonest. Associated Colles' fracture was seen in 8% of cases. Three cases had a previous history of fracture neck femur on the contralateral side, which was treated by hemiarthroplasty with bipolar prosthesis. Six cases were operated on contralateral side for intertrochanteric fracture. Most patients were operated within a week of admission (52%). However, delay was noted in 48cases, either due to associated medical co-morbid conditions which lead to surgical unfitness or in cases which had delay in hospital admission. Average operative time was 81.8 minutes in uncemented bipolar group and 94mins in bipolar prosthesis with cement. Average blood loss was 239ml in cemented group and 205ml in uncemented group. Average time for full weight bearing was 6.45 days with an average of 7.55 days in uncemented group and 5.35 days in cemented group. Average hospital stay post-operative was 12.1 days in uncemented bipolar group and 11.4 days in cemented group. In present study, the mean Harris hip score was found to be 87.9with an average of 89.25 in cemented bipolar group and 83.5 in bipolar group.

4. Discussion

Comparison of 100 cases of fractures of the neck of the femur who underwent hemiarthroplasty with uncemented bipolar and cemented prosthesis after 1year of follow up showed better results with cemented bipolar than in uncemented hemiarthroplasty.

The objective of the hemiarthroplasty was to achieve early mobilization, full weight bearing and early return to daily activities. Cemented hemiarthroplasty has been preferred over uncemented hemiarthroplasty because of less postoperative pain and better mobility.[4] The mean visual analog pain score at rest did not differ significantly between the groups.[6]In our study, pain was least in cemented bipolar group 80% patients had no pain, whereas in uncemented bipolar group 45% had no pain, 40% had occasional pain & 10% had mild pain. One patient had marked pain with limitation of activity.

Parker *et al*[3] undertook a similar study involving 400 patients with a displaced intracapsular fracture of the hip and found no statistically significant difference between treatment with a cemented Thompson hemiarthroplasty and an uncemented Austin-Moore prosthesis groups with regard to mortality, implant-related complications, re-operations or post-operative medical complications. In our study, there was no statistical difference between two groups with regard to post-operative mortality, average operative time and average post-operative hospital stay. This study does not have any statistical power to address the potential adverse effects of cement, and we did not find any indications of differences between the groups related to cementing, including mortality.

In the treatment of nonpathologic displaced femoral neck fractures, the use of cemented and uncemented femoral components is associated with similar functional outcome at 1 year.[5]In our study, cemented bipolar group had excellent results in functional assessment, with no limp in 85% patients but in uncemented bipolar group 15% patients had slight limp and 5% patient had moderate limp. There was poor mobility and greater dependence on walking aids in the uncemented group.[6] In cemented bipolar group, only 15% required cane for long walks (>1 km) but in uncemented group, 10% patients required cane all the time for walking. In cemented bipolar group, none of the patients had any significant deformity and range of motion was more than 160^0 which were better than uncemented bipolar where in 85% had range of motion more than 160^0.

In present study, the mean Harris hip score was found to be 87.9 with an average of 89.25 in cemented bipolar group and 83.5 in bipolar group. Taylor *et al*[6]found the Oxford hip score was significantly poorer in the uncemented group at six weeks (38.8 compared with 35.7 in the cemented group), and it was also poorer or similar at later follow-up time points although the differences were not significant.

In the current study, complication rate was 22%, dislocation were reported in 4 cases, 2 in uncemented and 2 in cemented group. 7 cases of superficial infection overall and 2 cases of deep infection were found 1 in each group. Taylor *et al*[6] found total number of complications was greater in the uncemented group as compared to cemented group. Loosening was significantly more common in the uncemented group. Intraoperative or postoperative fracture was also significantly more common in the uncemented group.

5. Conclusions

In elderly patients who were treated with hemiarthroplasty for a displaced femoral neck fracture, use of a cemented bipolar and uncemented bipolar provided a comparable outcome with regard to pain. However, complication rates were significantly lower in the group treated with a cemented implant. Better function and better mobility in the cemented group were observed which makes it a preferred choice over uncemented prosthesis.

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