MANAGEMENT OF FRACTURE NECK FEMUR WITH CEMENTED AND UNCEMENTED HEMIARTROPLASTY IN ELDERLY PATIENTS- COMPARISON OF OUTCOME THEREOF

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Abstract:
Management of displaced fracture neck of femur in elderly patients with cemented hemiarthroplasty is controversial. Uncemented prosthesis in fracture neck of femur is getting popularity now a days.

Aims And Objectives:- To evaluate the efficacy of cemented and uncemented bipolar hemiarthroplasty in management of fracture neck femur.

Material And Methods:- It is a multicentre Prospective Study conducted between 2015 to 2017 on 19 patients of displaced fracture of neck femur between the age group of 60 to 68 years, out of them 12 were female and 7 were male patients. Patients were divided into two groups Group A consists of 9 patients managed with Cemented Bipolar prosthesis. Group B consists of 10 patients managed with uncemented bipolar prosthesis.

All patients were operated by posterior approach and discharged on 11th postoperative day and were followed up at the end of 6 weeks, 12 weeks and 1 year. During follow up period, during each visit clinical and radiological evaluation was made. Functional outcome was assessed by using modified Harris Hip score.

Result:- Mean score of patients who were managed by uncemented hemiarthroplasty was 81.4% and for cemented Arthroplasty it was 86.5%

Conclusion:- This study implies that functional outcome of cemented hemiarthroplasty was better than the uncemented hemiarthroplasty though the operative time and blood loss was more among the cemented group but it had led to major complications.

Keywords: Fracture neck of femur, functional outcome, hemiarthroplasty.

Introduction:
Risk of femoral neck fractures among males and females do not have significant difference. The life time risk of fracture neck of femur is 9% in a female aged 50 years and above and it rises to 12% at 70 years and 18% by 90 years. Majority of these fractures occur in older patients caused by a trivial fall from standing position1. Unprotected precarious blood supply to femoral head inhibits healing leading to avascular necrosis of femoral head2. Controversies continue regarding their optimal treatment, including the choice of implant and fixation method3-5.
Internal fixation had a high failure rate resulting in non-union and avascular necrosis. These complications were addressed with the advent of hemiarthroplasty of the femoral neck.

Hemiarthroplasty is accepted as optimum treatment for displaced femoral neck fractures in most elderly patients. A Cemented hemiarthroplasty has been used in the majority of cases in most countries, but un cemented prosthesis is gaining popularity.

Cementing has potential pathological adverse side effects like cardiac arrhythmias and cardio-respiratory collapse. Fatal complications are caused either by embolism from marrow contents forced into circulation or by a direct toxic effect of the cement.

Clark et al found a transient but significant reduction in cardiac output and stroke volume for those receiving cemented prosthesis.

In uncemented prosthesis, bone quality is of importance, this is generally poor in elderly patients. Laporte et al stated two relative contraindications for uncemented total hip prosthesis: - Interference with bone in- growth and inability to achieve a congruent fit, both of these preclude establishment of rigid initial stability. As of today very few studies had compared the Cemented and uncemented prosthesis for hemiarthroplasty in India and so this study would throw some light on the advantages and disadvantages between these two methods.

**Aims And Objectives:**

To evaluate and compare the efficacy of cemented and uncemented bipolar hemiarthroplasty prosthesis in patients with femoral neck fractures.

**Exclusion Criteria:**

1. Patients with medical morbidities.
2. Patients with associated injuries.

**Material And Methods:**

A Prospective multicentre Study was conducted during 2015 to 2017 in Department Of Orthopedics. All the patients with isolated femoral neck fractures between the age group of 60 to 68 years were included in the study. Total 19 patients were included in the study and divided into two groups: - Group A had 9 patients which received cemented prosthesis. Group B had 11 patients which received uncemented prosthesis.

All the patients were subjected for pre-anaesthetic evaluation and adequate amount of blood were arranged for the surgery. Patient was then subjected to surgery under appropriate anaesthesia. Patients underwent a bipolar hemiarthroplasty with either a Cemented or uncemented prosthesis.

The arthroplasties were performed through a posterior approach with the patient in a lateral decubitus position using spinal anaesthesia.

**Post operative management:** Following protocol was adopted: -

- Post operative ICU care.
- Hip is positioned in approximately 15 degree abduction.
- Monitoring of Vitals and adequate blood transfusion.
- Antibiotics and DVT prophylaxis.
- Pain management by NSAIDs.
- Suture removal on the 11th postoperative day.

All the patients were discharged after stitches removal and were counselled to avoid squatting, cross leg sitting and to avoid strenuous activity. Static quadriceps strengthening exercises were started and patients were made to sit up on the bed from the 1st post operative day and were allowed to walk with walker.

Patients were followed up at the end of 6 weeks, 12 weeks and one year. During each visit functional outcome was assessed by using modified Harris Hip score which is a 100 point score which measures pain, gait, functional activity, deformity and range of motion. It is graded as score <70 as poor, 70 to 79 as fair, 80 to 90 as good, 90 to 100 as excellent. The radiological assessment was done for assessing the signs of loosening, migration of prosthesis and implant failure. Data were entered and analysed by statistical analysis. Mean and standard deviations were calculated for all parametric variables and comparison of the functional outcome between two groups was analysed using Chi-Square test.
Results:

The age of the study subjects ranged between 60 to 68 years. Time duration during fracture and surgery was 6 to 8 days. Taking into consideration of the five factors namely pain, gait, functional activity, deformity and range of motion we calculated the modified Harris Hip score for all the patients during the time of follow up and it was compared with their baseline score.

<table>
<thead>
<tr>
<th>Type of Hemiarthroplasty</th>
<th>Baseline score</th>
<th>End of 6 weeks</th>
<th>End of 3 months</th>
<th>End of 12 months</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cemented</td>
<td>78.3</td>
<td>74.2</td>
<td>79.8</td>
<td>86.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Un-Cemented</td>
<td>77.6</td>
<td>76.8</td>
<td>78.2</td>
<td>81.4</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Table 1- Functional measurement between the two groups by using modified Harris Hip score

Table 2 Functional Outcome measurement between the two groups by using modified Harris Hip score

Table 2 Functional Outcome of the study subjects at the end of 1 year

<table>
<thead>
<tr>
<th>Modified Harris Hip score</th>
<th>Un-Cemented</th>
<th>Cemented</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent (90-100)</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Good (80-89)</td>
<td>4</td>
<td>6</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Fair (70-79)</td>
<td>6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Poor (&lt;70)</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 Functional Outcome measurement between the two groups by using modified Harris Hip score during the follow-up period

Table 3 Radiological assessment of the study subjects at end of 1 year

<table>
<thead>
<tr>
<th>Radiological feature</th>
<th>Un-Cemented</th>
<th>Cemented</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varus deformity</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>No Abnormality detected</td>
<td>9</td>
<td>9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

Discussion:

In our study majority of patients were 60 years and above with mean age of 65 years with female preponderance, mainly due to osteoporosis prevalent in female population which is main risk factor for fracture neck of femur which in turn is more common among females. Khan et al.10 and Santini et al.11 also noted the same age group and sex.

Among the available surgical procedure hemiarthroplasty is more preferred. Hemiarthroplasty can be performed with both unipolar and bipolar prosthesis but bipolar prosthesis is commonly used as it causes less erosion and protrusion in acetabulum.

Recently some studies have assessed the indications for performing hemiarthroplasty with or without use of cement which had different results.

Majority of our study patients sustained the injury due to a trivial trauma and it was almost in par with the study done by T S Raghvendra et al.23.

In the current study it was proven that intraoperative blood and the duration of surgery was more among the cemented group than the uncemented group which was found to be statistically significant and similar type of results was also shown in the studies done by Haidukewych et al.16 and Drinker and Murray.17.

Deep vein thrombosis, pulmonary emboli, fat emboli and displacement of fracture of femoral neck are few post-operative complications reported in the previous studies which was more common among cemented hemiarthroplasty but in our study we did not experience any kind of these complications.5,18,19 As per modified Harris Hip score we found the hip score was 86.5 among the cemented group and it was 81.4 in the uncemented group.

1 (9.1%) patient in uncemented hemiarthroplasty group showed a varus deformity (Table 3)
at the end of 1 year and the difference was found to be statistically significant and many of the studies previously done are almost at par with our study\textsuperscript{10,18,20,21}.

Radiological assessment in the present study had shown that 1 patient in the uncemented group had developed varus deformity whereas in the cemented group none of the patients had developed and a similar type of result was also observed in a study done by Jameson S S et al\textsuperscript{22} in which he found reoperation was warranted among the uncemented group than the cemented group.

\textbf{Conclusion:}

Inference of this study reveals that functional outcome of cemented hemiarthroplasty was better than the uncemented hemiarthroplasty though the operative time and blood loss was more among cemented group, but it had not led to any major complications.

\textbf{References:}


