



COMPARISON OF CEMENTED VERSUS UNCEMENTED HEMIARTHROPLASTY OF THE HIP.

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ABSTRACT... The objective of this study was to compare the mean residual pain after cemented versus uncemented hemiarthroplasty of hip. **Study Design:** Randomized Controlled Trial. **Setting:** Orthopaedic Department, Allied Hospital, Faisalabad. **Period:** September 2016 to October 2017. **Materials and Methods:** Total 150 patients were admitted in orthopedic Department of Allied Hospital Faisalabad according to inclusion & exclusion criteria. After taking informed written consent, all patients were divided into two groups randomly. Cemented hemiarthroplasty was done in Group A patients and uncemented hemiarthroplasty was done in group B patient. All procedures were done by surgeon who has minimum 5yrs post fellowship experience. Monthly Follow up was done and residual pain was noticed at the end of 6th month. All the data was analyzed by using SPSS version 20.0. **Results:** In this study, in Group-A the patients between 65-75 years of age were 57.33% (n=43) and between 76-85 of age were 42.67% (n=32). In Group B the patients between 65-75 years of age were 56% (n=42) and between 76-85 years were 44% (n=33). The mean+sd was calculated and it is 73.49+4.99 years in Group-A patients and 73.73+4.74 years in Group-B patients. In Group A, males were 61.33% (n=46) and female were 38.67% (n=29). In Group B, males were 57.33% (n=43) and female were 42.67% (n=32). When we compared the residual pain after cemented versus uncemented hemiarthroplasty of the hip, it shows 1.69+0.35 in Group-A patients and 2.62+0.30 in Group-B patients. When we calculated p-value it was 0.0001 showing a significant difference. **Conclusion:** It is concluded that residual pain in cemented hemiarthroplasty is lower than uncemented hemiarthroplasty.

Key words: Cemented, Hemiarthroplasty, Intracapsular Hip Fractures, Residual Pain, Uncemented.

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INTRODUCTION

A hip fracture is the most devastating & challenging consequence of osteoporosis. The number of hip fractures are increasing in elderly people and major challenge for healthcare and economy.¹ The chosen approach has benefited as a factor that may reduce the complication rate & enhances the speed of recovery after surgery. This helps the surgeons to continue to develop and remodel surgical techniques and approach.²

The option of hip hemiarthroplasty is superior and long lasting to internal fixation for displaced neck of femur fracture enabling earlier mobility, less chances of revision surgery and better outcome in terms of function at one year.³ The choice of implant and whether implant is

cemented or uncemented remains controversial.⁴ Cementless implants are good for young patient because they have good bone stock and revision surgery is easy. On the other hand, cementing the femoral component does not necessarily increase the outcome.⁵ Although cemented implant given more secure fixation and results in less residual pain and better functional outcome. However, the insertion of cement into femur may complicate the operation and increase the risk of cardiovascular collapse.⁶ So upto now six small randomized controlled trials involved 549 patients have been conducted in a Cochrane review on this subject. This showed that patient with cemented hemiarthroplasty have lesser pain and good functional outcome & mobility than those of uncemented hemiarthroplasty.⁶

In another study, the mean residual pain after cemented hemiarthroplasty was 1.8+-1.2 and after uncemented hemiarthroplasty was 2.4+-1.4.⁷ The purpose of our study is to compare the residual pain in patients undergoing cemented hemiarthroplasty versus those undergoing uncemented hemiarthroplasty of the hip. So that based on these results, we adopt a method in our local population which helps us to reduce the residual pain after neck of femur fracture. The reduction in residual pain leads to early mobility, good functional outcome and early return to their routine activities. It overall improves socioeconomic status of the population

VISUAL ANALOGUE SCALE

A visual analogue scale (VAS) is a parameter to measure the intensity of pain and it has been widely used in diverse population. The VAS is a continuous scale that comprises of a horizontal line usually 10cm (100mm) in length and it is anchored by verbal descriptors for the measurement of the intensity of pain. The scale is most commonly described as no pain (score of 0) and pain as bad or worst (score of 100).

OBJECTIVES

The objective of this study was to compare the mean residual pain after cemented versus uncemented hemiarthroplasty of hip.

OPERATIONAL DEFINITIONS

Residual Pain

It was measured by using visual analogue scale (VAS) at the end of 6th month post-operatively.

MATERIAL AND METHOD

Study Design

Randomized Controlled Trials.

Setting

Orthopaedic Department, Allied Hospital, Faisalabad.

Duration of Study

September 2016 to October 2017.

Sample Size

The calculated sample size is 150.

Sampling Technique

Non-probability, consecutive sampling.

SAMPLING SELECTION

Inclusion Criteria

- All intracapsular fractures of neck of femur. (Confirmed as breach in continuity of bone by X-ray)
- Patient age between 65-85 years
- Both genders

Exclusion Criteria

- Open fractures
- History of hip surgery
- Co-morbid diseases like uncontrolled diabetes mellitus (assessed on history)
- Non willing patients

DATA COLLECTION AND ANALYSIS PROCEDURE

Total 150 patients were admitted in orthopedic Department of Allied Hospital Faisalabad according to inclusion & exclusion criteria. After taking informed written consent, all patients were divided into two groups randomly. Cemented hemiarthroplasty was done in Group A patients and uncemented hemiarthroplasty was done in group B patient. All procedures were done by surgeon who has minimum 5yrs post fellowship experience. Monthly Follow up was done and residual pain was noticed at the end of 6th month. All the data was analyzed by using SPSS version 20.0.

RESULTS

In this study, age distribution in Group-A, the patients between 65-75 years of age were 57.33% (n=43) and between 76-85 of age were 42.67% (n=32). In Group B the patients between 65-75 years of age were 56% (n=42) and between 76-85 years were 44% (n=33). The mean+sd was calculated and it is 73.49+4.99 years in Group-A patients and 73.73+4.74 years in Group-B patients (Table-I).

Gender distribution in Group A, males were 61.33% (n=46) and female were 38.67% (n=29). In Group B, males were 57.33% (n=43) and female were 42.67% (n=32) (Table-II).

When we compared the residual pain after cemented versus uncemented hemiarthroplasty

of the hip, it shows $1.69+0.35$ in Group-A patients and $2.62+0.30$ in Group-B patients. When we calculated p-value it was 0.0001 showing a significant difference (Table-III).

Effect modifiers like age, gender and duration of fracture were controlled through stratification and post-stratification independent sample 't' test was applied to see their effect on outcome. P-value ≤ 0.05 was considered as significant (Table-IV and V).

Age (years)	Group-A (n=75)		Group-B (n=75)	
	No. of Patients	%	No. of Patients	%
65-75	43	57.33	42	56
76-85	32	42.67	33	44
Total	75	100	75	100
Mean+SD	73.49+4.99		73.73+4.74	

Table-I. Age distribution (n=150)

Gender	Group-A (n=75)		Group-B (n=75)	
	No. of Patients	%	No. of Patients	%
Male	46	61.33	43	57.33
Female	29	38.67	32	42.67
Total	75	100	75	100

Table-II. Gender distribution (n=150)

Mean Residual Pain	Group-A (n=75)		Group-B (n=75)	
	Mean	S.D	Mean	S.D
	1.69	0.35	2.62	0.30

Table-III. Comparison of mean residual pain after cemented versus uncemented hemiarthroplasty of hip (n=150) P value=0.0001

Age (years)	Group-A (n=75)		Group-B (n=75)		P-Value
	Mean	S.D	Mean	S.D	
65-75	1.69	0.38	2.62	0.30	0.0001
76-85	1.70	0.32	2.61	0.31	0.0001

Table-IV. Stratification for mean residual pain after cemented versus uncemented hemiarthroplasty of hip with regards to age (n=150)

Gender	Group-A (n=75)		Group-B (n=75)		P-Value
	Mean	S.D	Mean	S.D	
Male	1.67	0.34	2.59	0.29	0.0001
Female	1.73	0.37	2.65	0.31	0.0001

Table-V. Stratification for mean residual pain after cemented versus uncemented hemiarthroplasty of hip with regards to gender (n=150)

DISCUSSION

Fractures of the neck of femur in old age patients either treated by Austin Moore Prosthesis, Thompson Prosthesis or Bipolar hemiarthroplasty. There are certain merits and demerits of cemented hemiarthroplasty versus uncemented hemiarthroplasty. Cemented implant gives more secure fixation and have reduction in residual pain and better functional outcome. However, the insertion of cement into the femur may increase the rate of complication and increase the risk of cardiovascular collapse.

The purpose of our study is to compare the mean residual pain after cemented versus uncemented hemiarthroplasty of hip in local population.

In this study, in Group-A, the patients between 65-75 years of age were 57.33% (n=43) and between 76-85 of age were 42.67% (n=32). In Group B the patients between 65-75 years of age were 56% (n=42) and between 76-85 years were 44% (n=33). The mean+sd was calculated and it is 73.49+4.99 years in Group-A patients and 73.73+4.74 years in Group-B patients. In Group A, males were 61.33% (n=46) and female were 38.67% (n=29). In Group B, males were 57.33% (n=43) and female were 42.67% (n=32). When we compared the residual pain after cemented versus uncemented hemiarthroplasty of the hip, it shows $1.69+0.35$ in Group-A patients and $2.62+0.30$ in Group-B patients. When we calculated p-value it was 0.0001 showing a significant difference.

We compared our results with a previous study, where the mean residual pain after cemented hemiarthroplasty of hip was 1.8 ± 1.2 and after uncemented hemiarthroplasty was 2.4 ± 1.4 ⁷, these findings are comparable with our results.

In Cochrane review, six small randomized controlled trials involved 549 patients have been conducted. This showed that patient with cemented hemiarthroplasty have lesser pain and good functional outcome & mobility than those of uncemented hemiarthroplasty.⁶ They concluded that there was limited evidence that cemented hemiarthroplasty help in reduction of post-operative pain and better functional outcome.

They concluded further randomized controlled trials were needed.

According to Australian National Joint Replacement Registry⁹, cemented Thompson prosthesis have lesser chance of revision surgery than uncemented Austin Moore prosthesis. For registered 15000 cases the revision surgery rate was markedly high ($p < 0.001$) for the uncemented implants. According to the Australian data they found that, the revision rate after four Years of surgery was 4% in cemented Thompson prosthesis versus 6% for uncemented Austin Moore prosthesis.

In 1982, Sonne-Holm, Walter and Jensen¹⁰, conduct a study in 112 patients to compare the results of cemented versus uncemented Austin-Moore hemiarthroplasty. They found that there was no significant difference in mortality between the two groups. But the patient treated with cemented Austin Moore hemiarthroplasty have less pain and better functional outcome. Similar result was found in another study including 50 patients to compare a cemented versus uncemented bipolar hemiarthroplasty.¹¹

Branfoot, also conduct a study in 91 patients, to compare a cemented Thompson prosthesis versus uncemented Thompson prosthesis. The result of the study was no significant difference in mortality in both groups. The mean pain score in 70 patients was high indicating more pain for the uncemented Thompson prosthesis. Although the result of cemented and uncemented Thompson prosthesis were not statistically significant.

In light of our results, the hypothesis that “cemented hemiarthroplasty is better than uncemented hemiarthroplasty of hip in terms of mean residual pain” is justified.

However, considering these results, the approach with lesser residual pain should be opted in our routine practice guidelines for these particular patients that may help to reduce their morbidity by early mobility and return to their routine activities.

CONCLUSION

It is concluded that residual pain in cemented hemiarthroplasty is lower than uncemented hemiarthroplasty.




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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Hafiz Salman Saeed	Manuscript writing & statistical analysis.	
2	Farhad Alam	Intellectual concept of the article & manuscript writing.	
3	Muhammad Yousaf	Data collection & data analysis.	
4	Iqra Fayyaz	Proof reading.	