



CEMENTED VERSUS UNCEMENTED HEMIARTHROPLASTY IN THE MANAGEMENT OF FRACTURE NECK OF FEMUR. A COMPARATIVE STUDY

Orthopaedics

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ABSTRACT

Background: The study has been carried out to study the advantages, complications, morbidity and mortality rates, the recovery to physical independence encountered in each of the procedure and to draw a conclusion based on study results as to which of the above type of implant and type of fixation would be better in the management of fracture neck of femur on elderly. **Materials and method :** The comparative study includes 60 cases of displaced intracapsular fracture neck of femur in elderly aged more than 60 years, divided into 2 groups with 30 patients assigned randomly. One group was treated by uncemented hemiarthroplasty whereas the other group was treated with cemented hemiarthroplasty. Post operatively cases were followed up for 12 months period and functional evaluation was done at the end of this period using Harris hip score and VAS score. **Results :** There was no statistical difference in harris hip score and VAS score between the two groups. Significant statistical difference exists in term of surgical time (97.63minutes versus 60.83minutes) and blood loss (298.67ml versus 181.83ml) for the cemented cohort than the uncemented. **Conclusion :** In the treatment of nonpathological displaced femoral neck fractures, the use of cemented and uncemented femoral components is associated with similar functional outcome at 1 year. However, greater care must be exercised while conducting cemented hemiarthroplasty in elderly patients with associated morbidities considering the increased surgical time and blood loss with the added effect of cement on the cardiovascular system.

KEYWORDS

Bipolar Hemiarthroplasty , Bone Cement , Harris hip score

INTRODUCTION

- Fracture neck femur in the elderly is associated with high risk of morbidity and mortality.
- Incidence of hip fractures is 159/100,000(India)
- Why to study √ Which type of implant and fixation is better √Advantages, complications and recovery to physical independence √ No strict protocol about cemented or uncemented prosthesis √ Insufficient data regarding comparison

CEMENTED HEMIARTHROPLASTY	UNCEMENTED HEMIARTHROPLASTY
Cement provides solid bone – implant interface	Bipolar prosthesis is placed press-fit in the femur.
ADVANTAGES - Less post-operative thigh pain - Early ambulation	ADVANTAGES Less operative time and blood loss
DISADVANTAGES - Bone cement impalantation syndrome (BCIS) - Dislocation	DISADVANTAGES - Periprosthetic fracture - Loosening of implant

MATERIALS AND METHOD

60 patients with fracture neck femur has been randomly divided into 2 groups with 30 Patients in each group. Bipolar cemented hemiarthroplasty done in one group and Bipolar uncemented hemiarthroplasty done in another group. Regular follow up at 1 month, 3 months, 6 months and at 12 months done radiologically by X-Ray Pelvis both hip AP view and Clinically by VAS(Visual Analogue Scale) and HHS (Harris Hip Score).

INCLUSION CRITERIA

- Age > 60 years.
- Closed displaced intracapsular fracture neck of femur.

EXCLUSION CRITERIA

- Extracapsular fracture neck of femur
- Valgus impacted fracture.
- Other associated fractures of the ipsilateral femur and acetabulum
- Active infection around hip.

IMPLANT DESIGN

- In the present study we have used the Bipolar endoprosthesis.

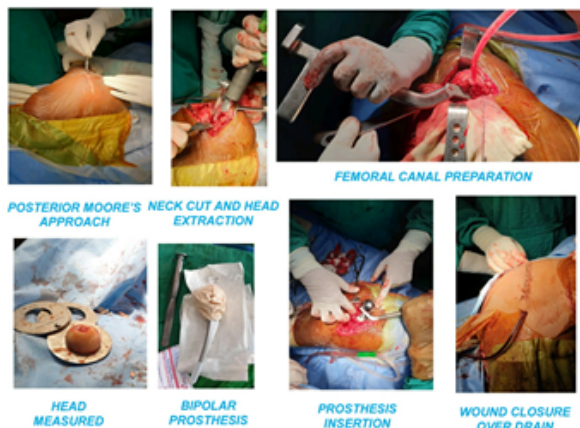


- The provision of a completely mobile head element and the addition of another head surface for motion in the acetabulum create a compound system.

Components of Acrylic Bone Cement

Powder	Liquid
Polymer	Monomer
Polymethylmethacrylate/copolymer (PMMA)	Methylmethacrylate (MMA)
Initiator	Accelerator
Benzoyl peroxide (BPO)	N,N-Dimethyl para-toluidine (DMPT)
Radio-opacifier	Stabilizer
Zirconium dioxide (ZrO ₂)	eg. hydroquinone
Antibiotics	

SURGICAL TECHNIQUE



RESULTS

- Age is 66.62 years(60-83 years)
- Sex : Female : Male :: 1.4:1
- Mechanism of injury – fall 88.33%

	UNCEMENTED GROUP	CEMENTED GROUP	P-VALUE
MEAN AGE (YEARS)	65.37	68.45	>0.05
SEX (FEMALE / MALE)	17 / 13	18 / 12	
SIDE (RIGHT / LEFT)	14 / 16	11 / 19	

MECHANISM OF INJURY (FALL / RTA)	26 / 4	27 / 3	
TYPE OF FRACTURE (GARDEN 3 / GARDEN 4)	12 / 18	10 / 20	

Cemented Hemiarthroplasty takes more operative time and more blood loss when compared to uncemented.

Clinical Studies	Mean amount of blood loss in ML		Mean Duration of Surgery in Mins	
	Uncemented	Cemented	Uncemented	Cemented
Figved et.al	300	390	70.2	82.6
Li-Xing et.al	338	476	80	95
Our Study	181.83	298.67	60.83	97.63

Improvement in functional outcome (HHS) and pain score (VAS) is observed from 6 weeks to 12 months but is not found to be statistically significant.

Clinical Studies	Mean Harris Hip Functional Scoring at 12 months	
	Uncemented	Cemented
Figved et.al	79.8	78.9
Our study	79.68	84.35

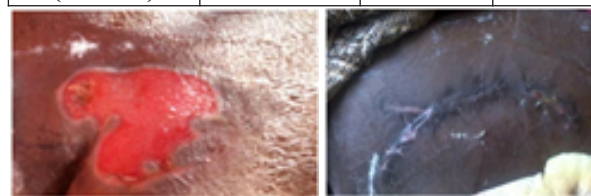
No mortality in our study. Hansen et al and Jaimo et al who compared mortality found no statistical difference between the groups.

COMPLICATIONS

Distribution of Complications Results				
Complications	Uncemented		Cemented	
	Frequency	Percentage	Frequency	Percentage
Death	0	0	0	0
Periprosthetic #	2	6.7	0	0
Deep infection	0	0	0	0
Superficial Infection	2	6.7	1	3.3
Dislocation	0	0	1	3.3
Bedsores	3	10	2	6.7
BCIS	0	0	1	3.3
Sciatic Neuropathy	0	0	1	3.3

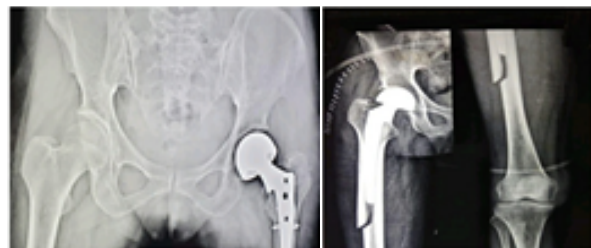
>0.05

	UNCEMENTED	CEMENTED	P-VALUE
BLOOD LOSS (in ML)	181.83	298.67	< 0.001
OPERATIVE TIME (In MINS)	60.83	97.63	<0.001



BED SORE GRADE 1

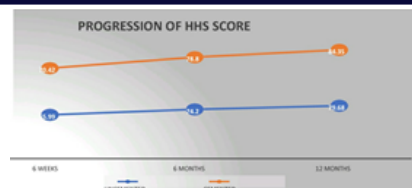
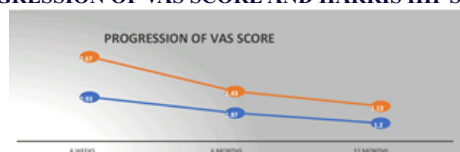
SUPERFICIAL INFECTION



PERIPROSTHETIC # (VANCOUVER TYPE A2)

PERIPROSTHETIC # (VANCOUVER TYPE B3)

PROGRESSION OF VAS SCORE AND HARRIS HIP SCORE



TOTAL FUNCTIONAL RESULTS AT 12 MONTHS

Good to excellent outcome was 73.33% in cemented group as opposed to 50% in uncemented group.

CRITERIA	UNCEMENTED		CEMENTED	
	Frequency	Percentage	Frequency	Percentage
Excellent	6	20%	9	30%
Good	9	30%	23	43.33%
Fair	9	30%	4	13.33%
Poor	6	20%	4	13.33%
Total	30	100%	30	100%
P - VALUE	0.077 - Statistically insignificant			

Case 1 : CEMENTED HEMIARTHROPLASTY



CASE 2 : UNCEMENTED HEMIARTHROPLASTY



DISCUSSION

- We had two cases (6.7%) of periprosthetic fracture in the uncemented group which occurred during prosthesis reduction.

	UNCEMENTED GROUP	CEMENTED GROUP
Foster et.al	7%	-
Figved et.al	1.9%	0.9%
Our study	6.7%	0

- We had one case of dislocation (3.3%) in cemented group which was found on the third post-operative day. The dislocation was successfully reduced under general anesthesia.

	UNCEMENTED GROUP	CEMENTED GROUP
Jamson et.al	0.25%	0.44%
Figved et.al	4.5%	4.6%
Our study	0	3.3%

CONCLUSION

Bipolar hemiarthroplasty whether cemented or uncemented is an excellent treatment for fracture neck femur.

No significant difference between both methods.

Cemented hemiarthroplasty better

✓ Less post-operative pain and complications

✓ Better functional outcome

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