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Comparitive Study of Fracture Neck of Femur Treated With Total Hip Replacement and Hemiarthroplasty in Elderly (Above 60 Years)

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Abstract: *Intracapsular fracture neck of femur have always presented great challenges to orthopaedic surgeons and remain in many ways today the unsolved fracture as far as treatment and results are concerned Intracapsular fractures are devastating injuries that most often affect the elderly. Intracapsular fractures are very rare in young individuals with normal bone. The incidence of intracapsular fractures is increasing in the modern world due to high energy trauma associated with road traffic accidents.This study aims at retrospectively analysing the functional outcome of 2 accepted modalities of treatment in the age above 60 years,in Garden's type I and II fractures,namely 1)Hemiarthroplasty 2)Total hip replacement*
Keywords: *Hemiarthroplasty,Total hip replacement,Fracture neck of femur,resurgery,complications*

I. Introduction

Intracapsular fractures of the proximal femur form a major share of fractures in the elderly.[1] Osteoporosis, co-morbidities, increased incidence of trivial trauma increases the incidence and complicates the treatment of these fractures. This high incidence is due to weak bones and increased incidence of trivial trauma. People in this age group suffer from numerous illnesses that can aggravate the morbidity following fractures and complicate the treatment of these fractures. The treatment goal is to return the patient to his or her pre-morbid status of function. Increase in the average lifespan and improved medical facilities have greatly increased the incidence of these fractures.

Management of femoral neck fractures in elderly patients has been controversial. Femoral neck fractures have been considered 'unsolvable fractures' in the older era of orthopedics[2] due to the high rate of associated complications, which include nonunion and vavascular necrosis of the femoral head, among others. Presently, there are multiple surgical treatment options (cannulated screws, dynamic hip screw systems, blade plates, hemi and total hip arthroplasty) available. Intracapsular extent of the fracture, tenuous blood supply to the femoral head going through the neck and difficulty in maintaining fracture reduction have been cited as reasons for failure of fixation.[2–4] Although treatment methods have been refined over the years, a consensus on the ideal treatment remains elusive. Total hip replacement (THR) is established in osteoarthritis and rheumatoid arthritis and has also been used as a primary procedure for displaced fractures of the femoral neck.[5-6]The major drawback has been the fear of dislocation, reported to occur in 11% (0 to 18). There have been few randomised controlled trials which have compared internal fixation (IF) with THR.[5,6] Despite a relatively high dislocation rate, particularly in patients with cognitive impairment,[6] THR is recommended as the primary treatment because of the low rate of reoperation and better immediate function of the hip. This study aims at retrospectively analysing the functional outcome of 2 accepted modalities of treatment in the age group 60-75 years,in Garden's all types fractures, namely

- Total hip replacement
- Prosthetic replacement of the femoral head(Hemiarthroplasty)

II. Hemiarthroplasty Or Total Endoprosthesis

The available options are the replacement of just the femoral part of the hip joint with a unipolar or bipolar prosthetic head (dual head) or else total endoprosthesis. The prosthetic head entails a higher risk of possible protrusion[7]. The TEP delivered better results after three years and in the longer term with regard to pain and function[8,9,10]; the revision rate is 6% after 13 years compared with 33% for osteosynthesis and 24% for hemiprosthesis. Duration of surgery, blood loss, and the risk of early postoperative luxation are lower if merely the head is replaced[16]. The failure rate for hemiarthroplasty (loosening of the prosthesis and degeneration of the acetabulum) is lower after the 75th year of life . When coxarthritis related changes are present, a hemiprosthesis is contraindicated.

Cement

- The use of bone cement is partly determined by the bone quality that becomes apparent during the operation. The risk associated with cement use—fat embolism and right heart strain[11]—have to be considered, particularly in patients with reduced physiological resources. Modern cementing techniques are obligatory (preservation of the region of subchondral sclerosis, cement plug restrictors, pressure flush, retrograde filling, vacuum technique). Currently, 65% of hip prostheses are implanted cement-free[12]. A contact allergy to cement components (mostly gentamicin) was found in one quarter of patients with an allergic reaction to the implant

Dislocation Rate

Dislocation of the prosthesis has been the major concern after a primary total hip replacement[13,14]. We tried to find a relationship between surgical approach and dislocation. However, it was impossible as mixed surgical approaches were used in each group. A higher rate of dislocation was reported previously in total hip replacement[15,16]. In patients using a posterolateral approach during the surgery, reported incidence of dislocation ranged between 13% to 22% [16,17,18,19]. Potential risk factors leading to dislocation include component design, operative approach, and around soft-tissue tensioning. Surgical approach has been an important factor that influences the stability of hip joint. Woo and Morrey et al[26] reported a much higher dislocation rate for the posterior approach (5.8%) than that for anterolateral approach (2.3%) ($p<0.01$). In this review, six studies provided the data about dislocation

III. Erosion and Revision

Acetabular erosion is a very severe complication of both unipolar and bipolar HA (reaching to 36% and 26% of hips, respectively) after five years of follow-up postoperatively which often leading to revision surgery[20,21,22]. In younger patients, this change would be more frequent because of more activity. Acetabular erosion has been considered to be one important factor influencing the functional outcome. The majority of the patients receiving hemiarthroplasty experienced revision surgery which might result from the degeneration of acetabular cartilage or erosion of the prosthesis[23,24]. In the hemiarthroplasty group, the bipolar prosthesis usually had a better result than the unipolar prosthesis . In this study, a bipolar component was used in 90% of the patients undergoing hemiarthroplasty and a monopolar component for the other 10% of the patients. Even though, the revision rate of HA group appeared to be more than two folds higher than that after THR, 78% resulted from erosion in HA group. When we linked the data from 12 month to 156 month of five inclusive studies, another interesting and obvious finding was that compared to HA, THR revealed notable dominance of relatively lower increasing rate of revision with the passage of time. Patients who had a 'secondary' total hip replacement for a failed hemiarthroplasty would feel much better than those who retained their hemiarthroplasty (e.g less pain and better functional outcome). But they were less likely to restore their independency than those who undertook the same procedure initially[25]. Possible reasons might be the experience of suffering two surgeries at different periods and more complications after the secondary surgery. To reduce the rate of erosion, revision and subsequent bad functional results, THR should replace HA from the beginning in some patients.

IV. Method of Collection of Data

- **Sample size :**

30 Cases each satisfying the inclusion criteria

Inclusion criteria:

1) Patient above age of 60 years
2) Gardens all types
3) Patient who were mobile prior to the fall/fracture

Exclusion criteria:

1) patients not willing for surgery.
2) patients medically unfit for surgery.
3) patient below age of 60 years
4) Patient with dementia and bed ridden patients

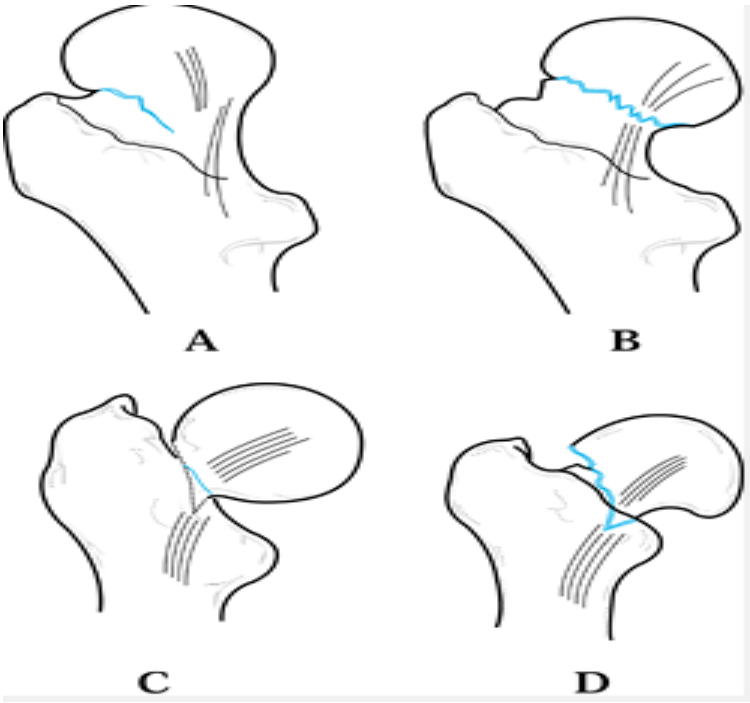
Surgeons used an anterolateral approach (modified Hardinge[14]), with the patient in the lateral decubitus position.

Objectives of the Study:

To do a comparative study on the functional outcome of intracapsular fracture of femoral neck with total hip replacement and hemiarthroplasty,as a primary modality of treatment with regard to

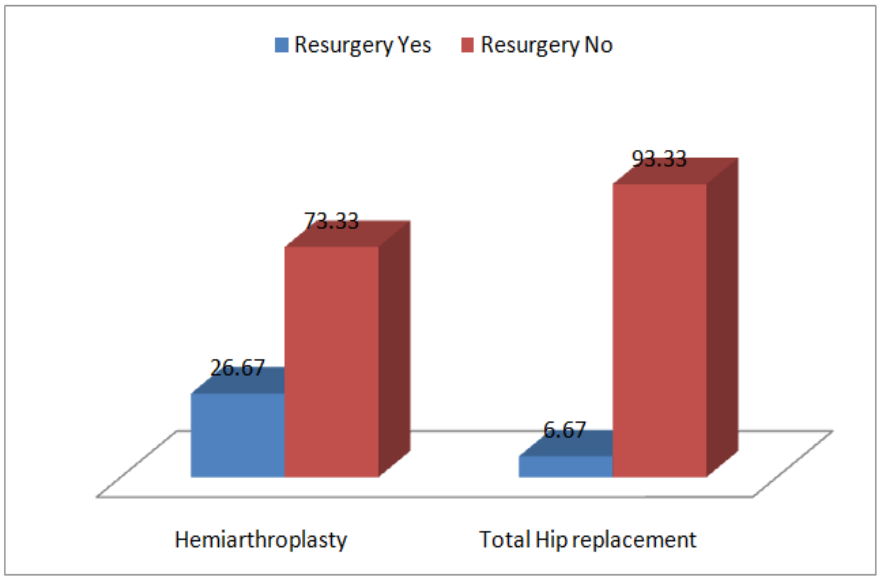
1) Patient mortality and morbidity

2) Need for secondary surgery
3) Implant failure



Garden classification of femoral neck fractures.
A: Stage I: Incomplete fracture that is abducted and impacted.
B: Stage II: Complete fracture without displacement. Note that the compression trabeculae are aligned.
C: Stage III: Complete fracture with partial displacement. The neck is still in apposition posteroinferiorly; therefore, the fragments have rotated in opposite directions like two cogwheels. Note that the compression trabeculae are angulated.
D: Stage IV: Complete fracture with full displacement.

		Group		Total	
		Hemiarthroplasty	Total Hip replacement		
Resurgery	Yes	26.67	6.67	16.66667	
	No	73.33	93.33	83.33333	
Total		100	100	100	



		Group		
		Hemiarthroplasty	Total Hip replacement	Total
	F	17	18	35
		56.7%	60.0%	58.3%
	M	13	12	25
		43.3%	40.0%	41.7%
Total		30	30	60
		100.0%	100.0%	100.0%

X2=.069p=.793, NS

		Group		
		Hemiarthroplasty	Total Hip replacement	Total
Resurgery	Yes	8	2	10
		26.7%	6.7%	16.7%
	No	22	28	50
		73.3%	93.3%	83.3%
Total		30	30	60
		100.0%	100.0%	100.0%

X2=4.320 p=.038, sig

		Group		
		Hemiarthroplasty	Total Hip replacement	Total
Infection	Present	1	1	2
		3.3%	3.3%	3.3%
	Absent	29	29	58
		96.7%	96.7%	96.7%
Total		30	30	60
		100.0%	100.0%	100.0%

P=1.00, NS

		Group		
		Hemiarthroplasty	Total Hip replacement	Total
Dislocation	Present	2	0	2
		6.7%	.0%	3.3%
	Absent	28	30	58
		93.3%	100.0%	96.7%
Total		30	30	60
		100.0%	100.0%	100.0%

Fishers exact test p=.246, NS

		Group		
		Hemiarthroplasty	Total Hip replacement	Total
Periprosthetic fracture	Present	2	1	3
		6.7%	3.3%	5.0%
	Absent	28	29	57
		93.3%	96.7%	95.0%
Total		30	30	60
		100.0%	100.0%	100.0%

X2=.351p=.554, NS

		Group		
		Hemiarthroplasty	Total Hip replacement	Total
Accetabular errosion	Present	3	0	2
		10.0%	.0%	3.3%
	Absent	27	30	58
		90.0%	100.0%	96.7%
Total		30	30	60
		100.0%	100.0%	100.0%

Fishers exact test p=.119, NS

V. Results

As being most commonly followed modality of treatment for neck of femur fracture hemiarthroplasty is associated with higher incidence of resurgery and post operative complications like infection, dislocation, periprosthetic fractures and acetabular erosion lead to resurgery. According to study 26.67 % patient underwent resurgery that is hemiarthroplasty .Our study shows that there is lesser incidence of resurgery in patients with neck of femur treated with total hip arthroplasty in elderly i.e. 6.67 %.There is significant decrease in incidence of resurgery in total hip arthroplasty compared to hemiarthroplasty. According to this study total hip replacement can be used as primary treatment modality in neck of femur fracture in elderly.

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