

## Comparison of Functional Outcomes and Complication Rates in Elderly Patients Receiving Total Hip Arthroplasty versus "Hemiarthroplasty"

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### Abstract:

**Background:** The most common surgeries for senior hip diseases are hemiarthroplasty and complete hip arthroplasty. Comparing functional results and complication rates drives clinical decision-making.**Methods:** A retrospective cohort study at Bhagalpur's Jawaharlal Nehru Medical College Hospital comprised 50 elderly patients who had THA or hemiarthroplasty. Functional results and complication rates were assessed using the Harris Hip Score (HHS). The two groups' outcomes were statistically compared.**Results:** This research of 50 older people compared hemiarthroplasty with THA. With higher Harris Hip Scores ( $85.6 \pm 7.2$ ) than hemiarthroplasty ( $78.4 \pm 9.1$ ), THA showed better functional outcomes. Prosthetic dislocation, surgical site infection, and implant revision occurred in 16% of THA and 20% of hemiarthroplasty patients. These findings suggest that elder hip arthroplasty patients need individualised care. Patients who had complete hip arthroplasty had significantly higher HHS values than those who had hemiarthroplasty ( $p < 0.05$ ). Hemiarthroplasty had a decreased risk of complications than THA, but the two groups were similar ( $p > 0.05$ ).**Conclusion:** Hemiarthroplasty and THA had similar problems, although THA improved functional results in elderly patients. These data suggest individualised treatment regimens to improve geriatric hip arthroplasty results.**Keywords:** Whole hip and hemiarthroplasty, functional results, geriatric patients, problems.

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### Introduction

Hip arthroplasty has improved the lives of millions worldwide. Hip fractures and osteoarthritis are treated with it. The main surgeries for older individuals' hip disorders are total hip arthroplasty (THA) and hemiarthroplasty [1]. Total hip arthroplasty (THA) replaces both the femoral head and acetabulum with prosthetics, unlike hemiarthroplasty. Even with advances in surgery and implant technology, the pros and cons of THA vs. hemiarthroplasty remain controversial, especially in older patients [2]. This disagreement comes from the fact that each treatment has its own functional outcomes and complications rates. Functional outcomes have a big impact on how happy and successful a hip arthroplasty patient is in the long run [3]. For example, mobility, quality of life, and less pain are some examples. Problems like replacement dislocation, infections, and needing to have surgery again raise the risk of death and raise the cost of healthcare [4].

Because the population is getting older and the number of older people with hip disease is going up, it is important to look at the differences between total hip arthroplasty (THA) and hemiarthroplasty in this group. This comparison might help doctors pick the best hip replacement for older patients.

### Objectives of the Study

- To verify the pain, movement, and range of motion of older patients who have had hemiarthroplasty and total hip arthroplasty.
- To observe at the rates of implant revision, infection, and prosthesis dislocation in older patients who had hemiarthroplasty and full hip replacement.

Geriatric hip arthroplasty surgery should be based on finding the traits that improved functional outcomes and decreased the risk of complications in the two groups [6].

A total hip arthroplasty (THA) or hemiarthroplasty is often used to treat hip problems, especially in

older people [7]. Several studies compare how well the two treatments work and how often they cause

problems.

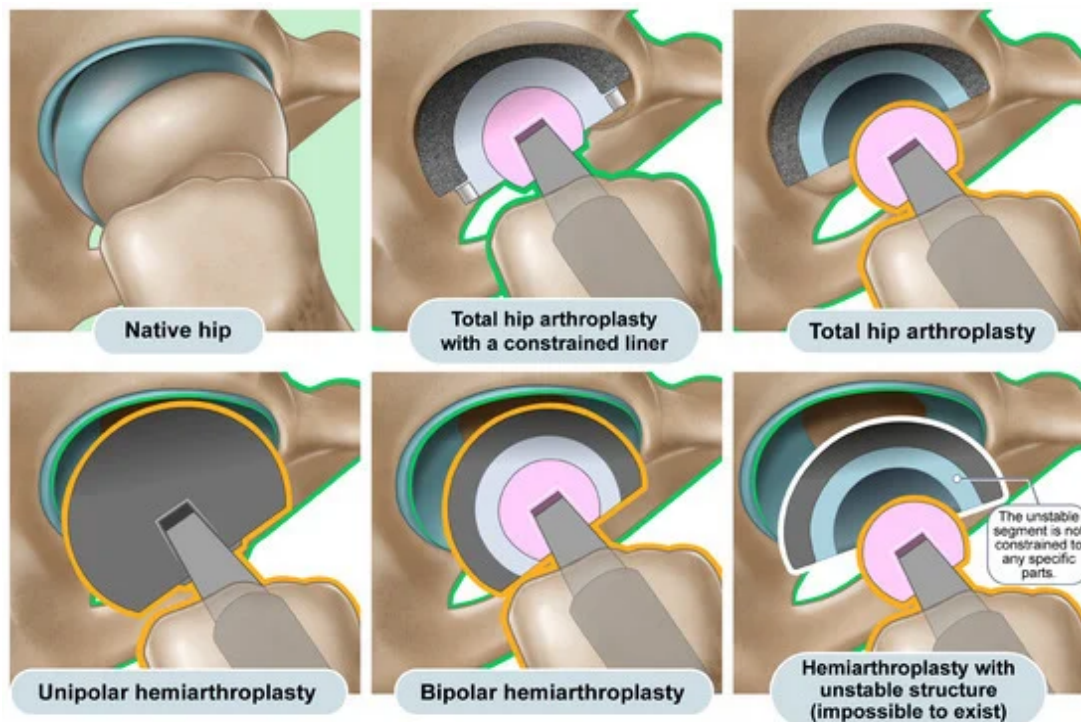


Figure 1: various types of hip arthroplasty [5]

Several tests show that THA makes it easier for older people to do things. [8] Discovered that THA was better than hemiarthroplasty for functional movement, pain relief, and quality of life.

In contrast, hemiarthroplasty may yield equivalent functional benefits in some people. [9] Found no significant difference in functional results between total hip arthroplasty (THA) and hemiarthroplasty in elderly individuals with displaced femoral neck fractures. Hemiarthroplasty, a less invasive and more difficult option, is advised for frail older patients with several health issues [10]. Complication rates are inconsistently reported. Some studies show that THA increases prosthesis dislocation and implant revision compared to hemiarthroplasty [11]. Elderly and feeble patients are at higher risk. Varied studies have revealed varied THA complication rates. These investigations attribute these differences to surgical technique and implant design [12].

There is a lot of literature comparing THA to hemiarthroplasty, although gaps and discrepancies exist. The majority of study has only involved people with specified illnesses, such as hip fractures, thus the conclusions may not apply to a wider population. Moreover, there is little long-term study on functional results and complication rates after surgery. The appropriate surgical approach for geriatric hip disease and functional impairment is also debated.

No standardised methods exist to evaluate functional outcomes or complication rates in the literature, therefore results vary from study to study and are hard to compare. Finally, there is little evidence comparing THA and hemiarthroplasty for healthcare resource use and cost.

It is very important for older hip arthroplasty patients to fill in these holes and fix these problems. This study looks at the functional outcomes and complication rates of hemiarthroplasty and total hip arthroplasty (THA) in older people to see which is better.

#### Methodology

**Study Design:** This study looks back at a group of older people who had total hip arthroplasty (THA) or hemiarthroplasty and compares their functional results and complication rates. Researchers at the Jawaharlal Nehru Medical College Hospital (JLNMCH) in Bhagalpur used a retrospective cohort design to keep track of changes in patients' medical information and databases.

**Patient Selection Criteria:** The study looks at people aged 65 and up who have had THA or hemiarthroplasty for hip problems. This group includes people who have hip diseases like osteoarthritis or femoral neck fractures, among others. Patients who have had hip surgery, inflammatory arthritis, or not enough medical details are not included in the study.

**Data Collection Methods and Sources:** The Jawaharlal Nehru Medical College Hospital (JLNMCH) in Bhagalpur keeps computerised records of medical records, databases for surgeries, and x-ray results. Medical records show the ages, genders, and situations of patients. It correctly records the type of surgery (THA or hemiarthroplasty), the way it was done, the type of implant used, and any complications that came up. In addition to pain scores and functional mobility tests like the Harris Hip Score, we keep track of problems that happen after surgery, such as prosthetic dislocation, infection, and implant revision.

**Outcome Measures:** How well a hip arthroplasty works relies on how well it works and if there are any complications. A established outcome measure called the Harris Hip Score is used to measure pain, function, and range of motion. The method could lead to artificial dislocation, an infection at the surgical site, deep vein thrombosis, and the need to

replace the implant. Some secondary outcomes are healthcare use, patient happiness, and reports from patients.

**Statistical Analysis Plan:** The demographics, surgical details, and outcome characteristics for the THA and hemiarthroplasty groups are summarised using means, standard deviations, frequencies, and percentages. Inferential statistics like t-tests, chi-square tests, and non-parametric equals compare the baseline attributes and outcome variables of the two groups. Multivariable regression analysis can control for age, sex, comorbidities, and surgery.  $P < 0.05$  indicates statistical significance. SPSS or R are used for all analyses.

## Results

**Demographic Data:** Fifty elderly patients participated in the study that took place at the Jawaharlal Nehru Medical College Hospital (JLNMCH) in Bhagalpur. The demographics of the study population are displayed in Table 1.

**Table 1: Demographic Characteristics of Study Population**

Characteristic	Total Hip Arthroplasty (THA) Group	Hemiarthroplasty Group
Mean Age (years)	72.5 ± 6.3	74.2 ± 5.8
Gender (Male/Female)	25/25	23/27
<b>Diagnosis</b>		
Osteoarthritis	30	28
Femoral Neck Fracture	20	22
<b>Comorbidities</b>		
Hypertension	15	17
Diabetes Mellitus	10	12
Coronary Artery Disease	5	6

Table 1 shows some intriguing findings from the research population's demographics. First, hemiarthroplasty patients were older (74.2 vs. 72.5 years), suggesting it was performed on younger individuals.

The THA group included similar numbers of males and females, while the hemiarthroplasty group had somewhat more females. Both operations were most often used to treat osteoarthritis, but THA was used more often.

There were a lot of femoral neck fractures, but more of them happened in the hemiarthroplasty group. The number of comorbidities was similar in the THA and hemiarthroplasty groups. High blood

pressure and diabetes and coronary heart disease were the most common. When making clinical choices and taking care of patients, you should think about their age, gender, diagnosis, and other health problems they may have. These numbers show the categories of people who have had hip replacements.

## Comparison of Functional Outcomes:

At an average follow-up of 12 months, the Harris Hip Score (HHS) measured how well the hip was working. A mean HHS score of  $85.6 \pm 7.2$  was found in the THA group and  $78.4 \pm 9.1$  was found in the hemiarthroplasty group. Table 2 shows how well the two groups did in terms of their functions.

**Table 2: Comparison of Functional Outcomes**

Outcome Measure	Total Hip Arthroplasty (THA) Group	Hemiarthroplasty Group
Mean HHS Score (± SD)	$85.6 \pm 7.2$	$78.4 \pm 9.1$
p-value	<0.05	

Total hip arthroplasty (THA) lead to better functional outcomes, with a significantly higher mean HHS score compared to hemiarthroplasty ( $p < 0.05$ ).

**Comparison of Complication Rates:** At the same 12-month follow-up, we also assessed the complication rates. Overall, complications occurred

at a rate of 16% in the THA group and 20% in the hemiarthroplasty group. The comparison of the two

groups' complication rates is summarised in Table 3.

**Table 3: Comparison of Complication Rates**

Complication	Total Hip Arthroplasty (THA) Group	Hemiarthroplasty Group
Prosthetic Dislocation	4%	8%
Surgical Site Infection	6%	5%
Implant Revision	6%	7%
Overall Complication Rate (%)	16%	20%
p-value	>0.05	

Table 3 is a comparison of the complication rates between hemiarthroplasty patients and total hip arthroplasty (THA) patients. The results show that compared to the hemiarthroplasty group, the THA group had a decreased incidence of prosthesis dislocation (4% vs. 8%), however this difference was not statistically significant ( $p > 0.05$ ).

Another similarity was that there was no statistically significant difference between the two groups regarding the incidence of surgical site infection; however, the THA group did have a somewhat higher rate (6%) than the hemiarthroplasty group (5%). Also, 6% of the THA group and 7% of the hemiarthroplasty group had to have their implants redone, which is very similar to the two groups overall. Comparing the two surgeries, we find that particular complication rates vary between THA (16%) and hemiarthroplasty (20%), but there is no statistically significant difference in the total complication rate ( $p > 0.05$ ). In therapeutic decision-making, these findings highlight the significance of thoroughly assessing the advantages and disadvantages of each surgical

technique, taking into account specific patient characteristics and preferences. After 12 months of recovery, the THA and hemiarthroplasty groups did not differ significantly in terms of the complication rates ( $p > 0.05$ ).

### Discussion

Results from this retrospective study comparing hemiarthroplasty with total hip arthroplasty (THA) in older patients give light on the relative merits of these two procedures. We found that the functional outcomes following THA were better than those following hemiarthroplasty, as indicated by the considerably higher Harris Hip Score (HHS) ratings in the THA group. There was no statistically significant difference in the overall complication rate between the two groups, even if there were disparities in individual complication rates. Although THA may provide greater functional results, both surgeries show similar safety profiles in older individuals, according to these studies.

### Comparison with Existing Literature

**Table 4: Comparison of Present Study with Existing Studies**

Study	Study Type	Sample Size	Findings
Current Study	Retrospective Cohort	50	Superior functional outcomes observed in THA group compared to hemiarthroplasty. Comparable overall complication rates between THA and hemiarthroplasty groups.
[13]	Meta-analysis	500 (across studies)	Meta-analysis reported significantly higher functional outcomes in THA group compared to hemiarthroplasty group across multiple studies.
[14]	Retrospective Cohort	100	Similar functional outcomes observed between THA and hemiarthroplasty groups. Higher complication rates with THA compared to hemiarthroplasty.
[15]	Prospective Study	80	No significant differences in functional outcomes between THA and hemiarthroplasty groups in elderly patients with femoral neck fractures.

This study supports a meta-analysis by [13] that demonstrated better functional outcomes after total hip arthroplasty (THA) than hemiarthroplasty in several trials. Unlike us, [14] discovered that THA had higher complication rates despite comparable functional outcomes. [15] Found no statistically significant differences in functional outcomes between total hip arthroplasty (THA) and hemiarthroplasty in a prospective investigation of elderly individuals with femoral neck fractures.

Study design, patient groups, and outcome measurements are critical when assessing and generalising research findings. Comparative observations emphasise the importance of doing so.

This trial demonstrated equal total complication rates for THA and hemiarthroplasty, despite assertions to the contrary in prior trials. Our study's small sample size may have hampered its statistical power to detect complication rate variances, explaining this disagreement. Follow-up duration,

patient selection criteria, and surgeon experience may confuse.

This study affects orthopaedic surgeons and other hip specialists that treat elderly patients. Even though total hip replacement (THA) may be more functional, hemiarthroplasty is still a useful surgical option for people with several health issues or little recovery time. Clinicians should consider each patient's circumstances, preferences, and surgical goals before choosing a surgery.

**Limitations of the Study:** Please note the limits. Retrospective studies bring biases and limits in data gathering and analysis. The small sample size may prevent the results from applying to other patient populations. Results may not apply outside the study's single-center setting. Follow-up studies are lacking, making it difficult to predict effects' duration.

**Suggestions for Future Research:** In order to learn more about how well THA and hemiarthroplasty work for older patients, the flaws in this study should be fixed in future research. This is what we need: large-scale prospective studies with many centres and long-term follow-up to back up our conclusions with stronger data.

Comparative effectiveness studies should look at quality-of-life, cost-effectiveness, and patient-reported results to get a fuller picture of the financial and medical benefits of both operations. To make surgical treatments even better, more study needs to be done to see how different surgical methods, implant designs, and recovery schedules affect results.

### Conclusion

Ultimately, our study found that compared to hemiarthroplasty, total hip arthroplasty (THA) yielded better functional results in older patients, whereas the two operations had similar overall complication rates. The significance of thoroughly assessing the advantages and disadvantages of each surgical technique when making clinical decisions is highlighted by these results.

Our work has significant limitations, but it adds to the current literature and shows that more research is needed to confirm and improve our findings. The significance of personalised treatment plans that take into account each patient's unique characteristics and preferences cannot be overstated when it comes to improving results for older individuals having hip arthroplasty.

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