

Long Term Outcome of Total Hip Replacement (THR) Cases

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Abstract

Background: THA is a successful orthopedic procedure that provides pain relief, restores function, and improves quality of life for patients with hip pain. Surgical techniques, biomaterials, prosthesis design, and fixation techniques have evolved over time. Sir John Charnley is credited as the father of THA for developing the fundamental principles of the artificial hip. Over 300,000 THAs are performed annually in the United States.

Methods: Patients underwent clinical evaluation using the Modified Harris Hip Score, WHOQOL score for quality of life assessment, and WHODAS 2.0 for disability assessment. Complete records of patients who had died during the study period were evaluated using the verbal autopsy proforma. Follow-up was conducted telephonically due to the Covid-19 pandemic and related restrictions, with verbal consent obtained before administering the questionnaire.

Results: The mean modified Harris Hip Score was 81.54 (out of 100), thus indicating good functional outcome. The mean disability score of our study participants was 7.57, thus indicating good satisfaction of the study participant. The mean score of WHO-QOL BREF domain 1 was 62.67 (SD 8.56), domain 2: 70.24 (SD 10.81), domain 3: 81.02 (SD 16.25) and domain 4: 79.95 (SD 14.96) thus indicating a remarkably good quality of life of the patients post-surgery. Hence they report with significantly high physical, mental and social improvements.

Conclusion: THA has had a revolutionary impact on the quality of life for individuals since the 1960s. It is considered "the operation of the century." The number of THA procedures performed annually is significant, with a growing trend worldwide. THA continues to be an important and successful intervention for patients with hip pain.

Keywords: Total hip arthroplasty (THA), Orthopedic procedure, Pain relief, Quality of life improvement.

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Introduction

Total hip arthroplasty (THA), also known as total hip replacement (THR), is a highly successful orthopedic procedure that provides relief from hip pain, improves function, and enhances quality of life. It has evolved over time with advancements in surgical technique, biomaterials, prosthesis design, and fixation techniques. Sir John Charnley, a British orthopedic surgeon, is credited as the father of THA for developing the fundamental principles of the artificial hip. Today, over 300,000 THAs are performed annually in the United States alone.[1]

THA has been hailed as the "operation of the century" for its transformative impact on the lives of people suffering from hip conditions. A survey of National Joint Registries estimated that around 959,000 primary and revision total hip procedures were performed annually worldwide, with a high rate of success. The global market for hip replacements has seen substantial growth, reaching \$4.8 billion in 2014 and projected to reach \$5.9 billion by 2020.[2]

Numerous studies have demonstrated the clinical benefit and cost-effectiveness of THA. It has been found to be a highly cost-effective intervention, with a favorable cost per quality-adjusted life year gained compared to no surgery. The normal hip functions as a "ball-and-socket" joint, and any condition affecting the hip can lead to joint deterioration, deformity, pain, and loss of function. Osteoarthritis is the most common condition affecting the hip, but other conditions like inflammatory arthritis, developmental dysplasia, trauma, and neoplasms can also contribute to hip problems.[3]

THA is an elective procedure that should be considered alongside other alternatives. The decision to proceed with THA

involves assessing the potential risks and benefits. While THA can be life-altering for suitable candidates, it is important to acknowledge the limitations and potential complications associated with the surgery. Preoperative evaluation and patient preparation are crucial for achieving successful outcomes in primary total hip arthroplasty.[4] Absolute contraindications include active infection in the hip joint or any other region of the body, as well as medical conditions that compromise a patient's ability to withstand anesthesia, surgery's metabolic demands, wound healing, and post-operative rehabilitation. Relative contraindications include processes rapidly destroying bone, neuropathic joint, insufficiency of the abductor mechanism, and urinary tract infections, particularly with *Klebsiella*. Complications associated with THR surgery include neurovascular injuries, fractures, post-operative infections, limb length discrepancy, and hip joint dislocation. Long-term complications such as femoral and acetabular loosening are of significant concern.[5]

Assessing the quality of life (QoL) is essential in understanding the impact of illnesses and their treatment. The World Health Organization (WHO) defines QoL as an individual's perception of their position in life, considering culture, values, goals, expectations, standards, and concerns. Disability resulting from conditions like osteoarthritis affects the QoL of patients, impacting their daily living and incurring substantial costs for the healthcare system and society. The Harris Hip Score (HHS) is a widely used tool for evaluating functional outcomes of THRs, but to minimize variability among surgeons, a modified HHS has been developed that removes the clinical evaluation component. QoL following

THR can also be assessed using the WHO QoL scoring system.[6]

At Dr. Rajendra Prasad Govt. Medical College Tanda, orthopedic surgeons have been performing THA with a focus on the hilly terrain and predominantly rural background of the patients. The study aims to evaluate the clinical outcomes of THA using modified Harris Hip Scoring, assess disability using the WHO disability assessment schedule, and evaluate the quality of life using the WHO QoL scoring system.[7]

Material And Methods

Study Area: Department of Orthopaedics, Dr. Rajendra Prasad Govt. Medical College Kangra at Tanda, Himachal Pradesh.

Study Design: A one-time follow up of a cohort of patients having undergone Total Hip Replacement between 2011-2018.

Study Population: Patients fulfilling the inclusion criteria.

Study Duration: One-year study duration- period of 2020-21. (Feb '20-Feb'21)

Inclusion Criteria

- Patients who have undergone Total hip arthroplasty between 2011-2018 done by single surgeon (Surgeon Specific).
- Those giving consent for inclusion in the study and willing to undergo detailed follow-up.

Exclusion Criteria

- Those patients in whom subjective assessment was difficult after surgery like one having compromised neurological functions e.g. in case of

Alzheimer's disease, Parkinsonism, cerebral palsy and patients with mental retardation were excluded from the surgery.

- The study was initiated following approval from Institutional Ethics Committee, Dr. Rajendra Prasad Government Medical College, Kangra at Tanda. The patients had the right to withdraw from participation in the study.

Methodology

After a detailed history, patients were clinically evaluated at the time of review in OPD using Modified Harris Hip Score. WHOQOL score was used for Quality of life and for disability assessment WHODAS 2.0 was used. The patients were examined clinically with the special emphasis on hips, knee and spine. The patients whose complete records were available but reported to have died during the period of study were evaluated using the verbal autopsy proforma. All the patients were followed up telephonically. In view of the Covid-19 pandemic and the restrictions ascertained, patients who could not report to the OPD were followed up using telephone interviews. Verbal consent was obtained prior to starting the questionnaire.

Statistical Analysis

Data was collected on a pre-designed proforma, cleaned and entered in excel sheet. Data was presented in the form of frequencies, percentages, mean and standard deviation wherever applicable. Statistical analysis will be performed using SPSS v16. The test for normality of data was done using Kolmogrov-Smirnov test.

Results

Table 1: Age

	Frequency	Proportion
Age (Mean±SD)	48.49 ± 13.94	
Gender		
Male	135	72.9%
Female	54	29.1%

There were 189 study participants in our study. The mean age of the study participants was 48.49 ± 13.94 years. In our study, males accounted for 72.9% of the total study participants while the rest were females.

Table 2: District

District		
Kangra	132	69.8%
Chamba	21	11.1%
Hamirpur	13	6.9%
Mandi	12	6.3%
Una	7	3.7%
Kinnaur	2	1.1%
Bilaspur	1	0.5%
Hamirpur	1	0.5%

69.8% of the study participants belonged to District Kangra followed by Chamba (11.1%) and Hamirpur (6.9%).

Table 3: Comorbidities

Comorbidities	Frequency	Percentage
None	87	46.0%
Hypertension	68	36.0%
Any Musculoskeletal injuries	13	6.9%
Diabetes Mellitus	10	5.3%
Hypothyroidism	5	2.6%
Obesity	5	2.6%
Tuberculosis	1	0.5%

46% of the study participants had no comorbidities. 36% of the study participants had a history of Hypertension, while the rest had a history of Musculoskeletal injuries followed by Diabetes Mellitus, Hypothyroidism, Obesity and Tuberculosis.

Table 4: Type of Surgery

Type of Surgery	Frequency	Percentage
Total Hip Replacement	189	100%

All patients had undergone Total Hip Arthroplasty.

Table 5: Participants having undergone Total Hip Replacement surgery

Siwach et al.	Nath et al.	Christopher L. Peters
83.5	79	84

The mean Modified Harris Hip score of the study participants in our study was 81.54 ± 9.237 .

Table 6: WHOQOL-BREF

Domain	Our Study	Kumar P et al.
Domain 1	62.67±8.56	70.8±21.6
Domain 2	70.24±10.81	72.4±18.8
Domain 3	81.02±16.25	74.7±16.8
Domain 4	79.95±14.96	75.4±14.8

In our study, Domain one showed inferior results in comparison with other studies due to the presence of associated comorbidities hampering the physical condition of the participants.

Table 7: WHO Disability Assessment Schedule

BROWN et el.	27.4 (30 days post-op)
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In the WHO Disability Assessment Schedule 2.0 (WHODAS), we observed that the mean disability score of our study participants was 7.57/48.

Discussion

Total Hip Replacement (THR) has seen significant advancements in design, components, materials, and understanding of hip mechanics, resulting in improved outcomes for patients. This surgical procedure provides pain relief, restores hip mobility and function, and enhances the quality of life when performed and managed effectively.[8]

A study was conducted to evaluate functional outcomes, disability, and quality of life after THR using the modified Harris Hip Scoring system, WHO Disability Assessment Schedule, and WHO QOL scoring system, respectively. The study included participants with a mean age of 48.49 years, lower than a previous study's mean age of 59.2 years. The male-to-female ratio was 2.4:1, and the majority of participants had no comorbidities, followed by hypertension and musculoskeletal injuries. All participants underwent THR, performed by a single surgeon, with cemented, uncemented, and hybrid prostheses used, with uncemented prostheses being the most common choice.[9]

The mean modified Harris Hip Score, which measures functional outcomes, was 81.54 out of 100 in the study. This improvement can be attributed to advancements such as less invasive surgical techniques, improved material wear resistance and biocompatibility, better understanding of hip anatomy and function, peri-operative management, and complication prevention. Other studies also reported similar improvements in functional outcomes after THR. [10]

Disability scores, assessed using the WHO Disability Assessment Schedule 2.0,

showed a mean score of 7.57 in the study. Satisfaction levels of patients after THR are not extensively documented, making this study novel in that aspect. The quality of life was assessed using the WHO-BREF scoring system, which considers physical health, psychological health, social relationships, and environment domains. The mean scores for these domains indicated a remarkably good overall quality of life for THR patients. Similar findings were reported in other studies, showing significant improvements in mental and social well-being following THR.[11]

The study also highlighted the efficacy of THR as an ideal treatment for fracture neck of femur and avascular necrosis with few contraindications. However, a possible limitation of the study is the lack of preoperative data on patients' conditions before primary hip arthroplasty.

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