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ORIGINAL ARTICL

Short-Term Functional Outcomes of Total Hip Replacement in Patients with Osteoarthritis — A Prospective Study

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ABSTRACT

Introduction: *Total hip replacement (THR) is a well-established surgical intervention for advanced osteoarthritis aimed at alleviating pain and restoring joint function. Evaluating short-term functional outcomes is critical to understanding the immediate benefits of the procedure and identifying factors influencing recovery. Improvements in mobility, pain relief, and quality of life are key indicators of success. This study aimed to assess the short-term functional outcomes of Total hip replacement (THR) in osteoarthritis patients.* ***Methods & Materials:*** *This prospective observational study was conducted at the Department of Orthopedics, Dhaka National Medical College, Dhaka, Bangladesh, from January 2014 to December 2024. A total of 30 patients of osteoarthritis managed by Primary total hip replacement were enrolled purposively. Outcomes were assessed clinically and functionally using the Modified Harris Hip Score. Data were analyzed using MS Office tools.* ***Results:*** *Avascular necrosis was the most common indication for hip replacement, accounting for 68.3% of cases. Postoperative complications included superficial infections (6.7%), limb length discrepancy (5.0%), foot drop (3.3%), and dislocation (1.7%). The mean Modified Harris Hip Score improved significantly from 31.4 ± 5.3 preoperatively to 87.6 ± 7.6 postoperatively ($p < 0.001$). Grading of the score showed that 63.3% of cases achieved excellent results, with 21.7% good, 11.7% fair, and 3.3% poor outcomes.* ***Conclusion:*** *The short-term functional outcomes of total hip replacement in osteoarthritis patients demonstrate significant improvement in both clinical and functional aspects. With minimal complications and a high percentage of excellent and good results, this procedure proves effective in enhancing patients' quality of life.*

Keywords: *Avascular necrosis, Functional outcomes, Limb length discrepancy, Osteoarthritis, Pain, Total hip replacement*

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INTRODUCTION

Total hip replacement (THR) is a highly effective procedure for patients suffering from hip joint deterioration caused by various conditions. It alleviates pain, improves mobility, restores limb length, and ensures stability while re-establishing the normal mechanics of the hip joint, significantly enhancing the patient's quality of life[1]. A stable, mobile, and painless hip is essential for normal locomotion. Currently, osteoarthritis is the most prevalent condition affecting the hips of the adult population, leading to severe hip pain, restricted movement, and disruptions in daily activities[2]. Primary THR has revolutionized patient outcomes by substantially improving both immediate and long-term results in terms of pain relief and functionality in osteoarthritic hips[3]. Functional improvements, including enhanced gait and range of motion, have been documented in numerous studies[4,5]. Currently, total hip arthroplasty (THA) is the most frequently performed joint replacement procedure, with its demand expected to grow exponentially in the coming years[6,7]. Successful THA requires secure prosthesis fixation to the bone, achieved either through polymethylmethacrylate (PMMA) cement or by bone ingrowth into a porous coating on the implant, leading to "biologic" fixation. Historically, the first recorded primary THR was performed by Phillip Wiles in London in 1938[8]. The operative technique underwent significant advancements in the 1950s, spearheaded by McKee and Farrar. Sir John Charnley further revolutionized total hip replacement (THR) by introducing low-friction arthroplasty, applying biomechanical principles of hip joint function, and refining the procedure, earning him the title of the "father of modern total hip arthroplasty"[9,10]. The Harris Hip Score, a reliable tool for evaluating clinical and functional outcomes, assesses pain, functional disabilities, deformities, and range of motion pre- and postoperatively[11]. This study involved 30 consecutive patients with unilateral or bilateral osteoarthritis, clinically and functionally assessed preoperatively and postoperatively using the Modified Harris Hip Score following primary THR.

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METHODS & MATERIALS

This was a prospective observational study that was conducted at the Department of Orthopedics, Dhaka National Medical College, Dhaka, Bangladesh, from January 2014 to December 2024. A total of 30 patients with osteoarthritis who underwent primary total hip replacement were purposively enrolled in this study. Clinical and functional assessments were performed preoperatively and postoperatively using the Modified Harris Hip Score[11]. The study included individuals with primary osteoarthritis of the hip, secondary osteoarthritis due to avascular necrosis, ankylosing spondylitis, and rheumatoid arthritis. Exclusion criteria comprised patients less than 40 years of age, those with active hip joint infections, previous failed hip surgeries (including Amputation, bipolar prosthesis, osteotomy, Dynamic hip screw, Proximal femoral nail), bone tumors involving the proximal femur and acetabulum, and neuropathic hip joints. Data analysis was performed using MS Office tools.

RESULT

The age distribution of our participants showed that the majority (60.0%) were in the 40–50 years age group, followed by 20.0% in the 51–60 years group. Additionally, 13.3% of cases were aged 61–70 years, while 6.7% were aged 71 years or older. [Table I]

Table – I: Age distribution of cases

Age (Years)	n	%
40-50	18	60.0%
51-60	6	20.0%
61-70	4	13.3%
≥71	2	6.7%

The figure shows the gender distribution of the study population. Out of the total participants, 63% (n=19) were male, while 37% (n=11) were female. This indicates a male predominance among the individuals included in the study. [Figure 1]

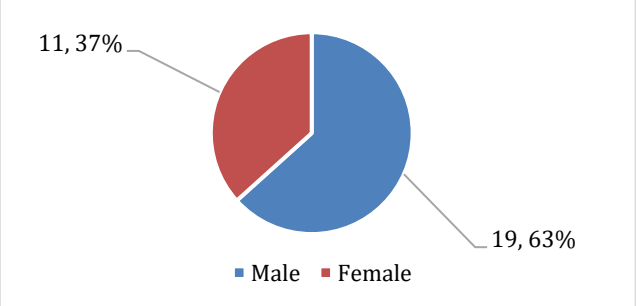

Figure – 1: Gender Distribution of Study Participants

This figure illustrates the preoperative diagnoses of patients included in the study. Avascular necrosis was the most common condition, accounting for 68.3% of cases. Primary osteoarthritis was observed in 16.7%, followed by ankylosing spondylitis in 8.3%, and rheumatoid arthritis in 6.7% of patients. These findings indicate that avascular necrosis was the leading indication for surgical intervention in the study population. [Figure 2].

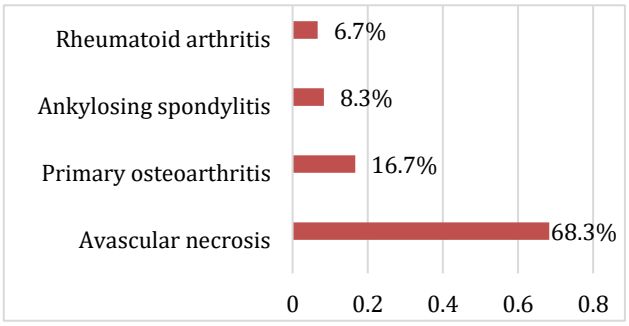

Figure – 2: Indication for Total hip replacement

The distribution of postoperative complications observed among the study participants. The most common complication was superficial infection, reported in 4 patients (6.7%). Limb length discrepancy was noted in 3 patients (5.0%), followed by foot drop in 2 patients (3.3%). Dislocation was the least frequent complication, occurring in only 1 patient (1.7%). [Table II].

Table – II: Post-operative complications

Complications	n	%
Limb length discrepancy	3	5.0%
Foot drop	2	3.3%
Superficial infection	4	6.7%
Dislocation	1	1.7%

This table shows the mean Modified Harris Hip Scores before and after surgery. The pre-operative mean score was 31.4 ± 5.3, which significantly improved to 87.6 ± 7.6 post-operatively. The difference was statistically significant ($p < 0.001$), indicating a marked improvement in hip function following the surgical intervention. [Table III].

Table – III: Modified Harris hip scores in mean

Status	Mean ±SD	p-value
Pre-operative	31.4±5.3	<0.001
Post-operative	87.6±7.6	

The figure illustrates the functional outcomes of patients evaluated by the Modified Harris Hip Score after surgery. A majority of patients (63.3%) achieved an excellent outcome, while 21.7% had a good outcome. 11.7% of patients were categorized as having a fair result, and only 3.3% had a poor outcome. This distribution indicates a high rate of favorable functional recovery among the study population. [Figure 3].

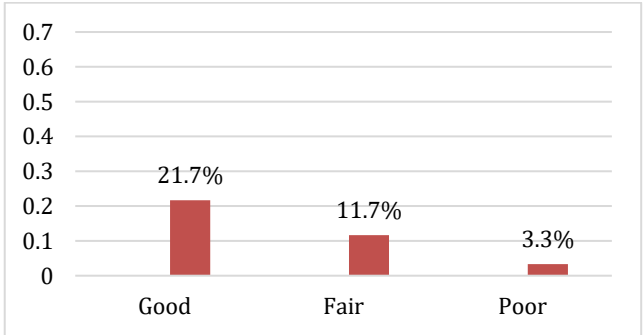

Figure – 3: Grading of modified Harris hip score

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DISCUSSION

The age distribution of our participants showed that the majority were in the 40–50 years age group, followed by 20.0% in the 51–60 years group. A similar age distribution trend was observed in the study of Jayaram, Shivananda and Gazanfar (2017)[12]. BK Dhaon et al. conducted a study among 34 patients, where 75% patients were male that was two-third of that study population[13]. In our study, nearly two-thirds of the participants were male, which was similar to the study of BK Dhaon et al. In the present study, avascular necrosis (20, 68.3%) emerged as the leading indication for hip replacement, followed by primary osteoarthritis (5, 16.7%) and ankylosing spondylitis (3, 8.3%). A similar trend was observed in a study by RC Siwach et al.[14]. That study reported that 360(72%) patients had avascular necrosis, 10(10%) patients had primary osteoarthritis and 20 (4%) patients were suffering from ankylosing spondylitis. Postoperative complications in our study included superficial infections, which were the most common, followed by limb length discrepancy, foot drop, and dislocation. Superficial infections were observed in the majority of cases, while limb length discrepancy occurred less frequently, followed by foot drop and dislocation, which were the least common complications. In another study, Qin et al. reported that major complications, longer postoperative stays, non-home discharges, and unplanned readmissions contributed to the increased cost of care for total hip arthroplasty following hip fractures[15]. In this study, the mean modified Harris Hip Scores showed a significant improvement, rising from a pre-operative mean of 31.4 ± 5.3 to a post-operative mean of 87.6 ± 7.6, with a p-value of <0.001. Comparative results were observed in a previous study conducted by Jayaram, Shivananda and Gazanfar (2017)[12]. In our study, the grading of the Modified Harris Hip Score revealed that 63% of study population achieved excellent results and 21.7% patients had good outcomes after surgery. Fadlalla et al conducted a study on Young Adults Patients who underwent Total Hip Replacement surgery in the year 2024 and found that, the majority of patients (65.6%) reported excellent functional outcomes and 28.1% patients reported good outcomes that reflects analogous of these two studies[16].

Total hip replacement is considered one of the most successful surgical procedures, offering excellent pain relief and restoration of function for patients with severe hip osteoarthritis[17]. The incidence of total hip replacement is expected to rise significantly in the coming decades[18,19]. However, it remains a major surgical intervention, carrying an increased risk of postoperative morbidity and mortality, especially among older populations[20]. Total Hip Replacement (THR) is a highly effective procedure for relieving pain and improving mobility in patients with hip joint diseases like avascular necrosis and osteoarthritis. It involves replacing the damaged joint with prosthetic components, leading to significant functional improvement. Though generally safe, complications like infection, dislocation, and foot drop may occur. With proper surgical technique and rehabilitation, most patients regain mobility within weeks, and implants typically last 15–20 years.

Conclusion

The short-term functional outcomes of total hip replacement in patients with osteoarthritis showed significant improvement in both clinical and functional measures. Avascular necrosis was the predominant indication for surgery, and the overall complication rate was relatively low. The substantial improvement in the Modified Harris Hip Score reflects the success of the procedure in restoring function and alleviating pain. Most patients experienced excellent or good outcomes, highlighting the effectiveness of total hip replacement in improving the quality of life for osteoarthritis patients.

Recommendation

This manuscript presents a well-conducted prospective study that effectively highlights the short-term functional outcomes of total hip replacement in osteoarthritis patients. The results are clearly presented, with statistically significant improvements in hip function and low complication rates. The study adds valuable evidence from a local context and supports the global literature on the efficacy of THR. I recommend this article for publication after minor revisions to improve language clarity and ensure consistent formatting throughout the manuscript.

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REFERENCES

1. *Turek's operative Orthopaedic principles and their applications 7th edition chapter 27-page 1086.*
2. *F. Guillemin, A.C. Rat, B. Mazieres, J. Pouchot, B. Fautrel, L. Euller-Ziegler, Fardellone, J. Morvan, C.H. Roux, E. Verrouil, A. Saraux, J. Coste. Prevalence of symptomatic hip and knee osteoarthritis: a two-phase population-based survey*
3. *Odri GA, Padiolleau GB, Gouin FT. Oversized cups as a major risk factor for postoperative pain after total hip arthroplasty. J Arthroplasty. 2014 Apr;29(4):753-6.*
4. *Hodt-Billington C, Helbostad JL, Vervaat W, et al. Changes in gait symmetry, gait velocity, and self-reported function following total hip replacement. J Rehabil Med;43–9:787.*
5. *Vissers MM, Bussmann JB, de Groot IB, et al. Walking and chair raising were performed in the daily life situation before and after total hip arthroplasty. Osteoarthritis Cartilage;19–9:1102.*
6. *Nho SJ, Kymes SM, Callaghan JJ, Felson DT. The burden of hip osteoarthritis in the United States: epidemiologic and economic considerations. J Am Acad Orthop Surg. 2013;21 Suppl 1: S1-6.*
7. *Jeffrey N Katz. Total joint replacement in osteoarthritis. Best Practice & Research Clinical Rheumatology Vol. 20, No. 1, pp. 145–153,2006.*
8. *Wiles P. The surgery of the osteoarthritic hip. Br J Surg 1958; 45:488–497.*
9. *Reynolds L A, Tansey E M. (eds) Early Development of Total Hip Replacement. Wellcome Witnesses to Twentieth Century Medicine, (2007) vol. 29. London.*
10. *Turek's Orthopedics Principles and Their Applications 7th edition. Pg no 1069.*
11. *Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation. J Bone Joint Surg Am. 1969 Jun;51(4):737- 55.*
12. *Jayaram, B. S., S. Shivananda, and Gazanfar Patel. "A study of clinical and functional outcome of primary total hip replacement in osteoarthritis of the hip." Indian Journal of Orthopaedics Surgery 3.3 (2017): 245-251.*
13. *BK Dhaon, Anuj Jaiswal, Vishal Nigam, Vineet Jain. Non-cemented total hip replacement in various disorders of the hip. Year: 2005 Volume: 39 Issue: 4 Page: 225-227.*
14. *RC Siwach, Virender Singh Kadyan, SS Sangwan, Rajiv Gupta. A retrospective study of total hip arthroplasty Year: 2007 Volume: 41 Issue: 1 Page: 62-66.*
15. *Qin CD, Helfrich MM, Fitz DW, Hardt KD, Beal MD, Manning DW., (2017) Differences in postoperative outcomes between total hip arthroplasty for fracture vs arthroplasty. J Arthroplasty 1–5. https://doi.org/10.1016/j.arth.2017.01.049*
16. *Fadlalla, Mahgoub HA, et al. "Functional Outcome After Total Hip Replacement using Ceramic-on-Ceramic among Young Adults Patients." Sudan Journal of Medical Sciences 19.3 (2024).*

ISSN: 2663-9491 e-ISSN: 2789-6897

17. *Daigle, M.E.; Weinstein, A.M.; Katz, J.N.; Losina, E. The cost-effectiveness of total joint arthroplasty: A systematic review of published literature. Best Pract. Res. Clin. Rheumatol. 2012, 26, 649–658.*
18. *Pabinger, C.; Lothaller, H.; Portner, N.; Geissler, A. Projections of hip arthroplasty in OECD countries up to 2050. Hip Int. 2018, 28, 498–506.*
19. *Ackerman, I.N.; Bohensky, M.A.; Zomer, E.; Tacey, M.; Gorelik, A.; Brand, C.A.; de Steiger, R. The projected burden of primary total knee and hip replacement for osteoarthritis in Australia to the year 2030. BMC Musculoskelet Disord. 2019, 20, 90.*
20. *Belmont, P.J., Jr.; Goodman, G.P.; Hamilton, W.; Waterman, B.R.; Bader, J.O.; Schoenfeld, A.J. Morbidity and mortality in the thirty days following total hip arthroplasty: Risk factors and incidence. J. Arthroplast. 2014, 29, 2025–2030.*

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APPENDIX

Figure – 4: X-ray of Pelvis and both Hip Joints - Anteroposterior (AP) View (Pre-operative)

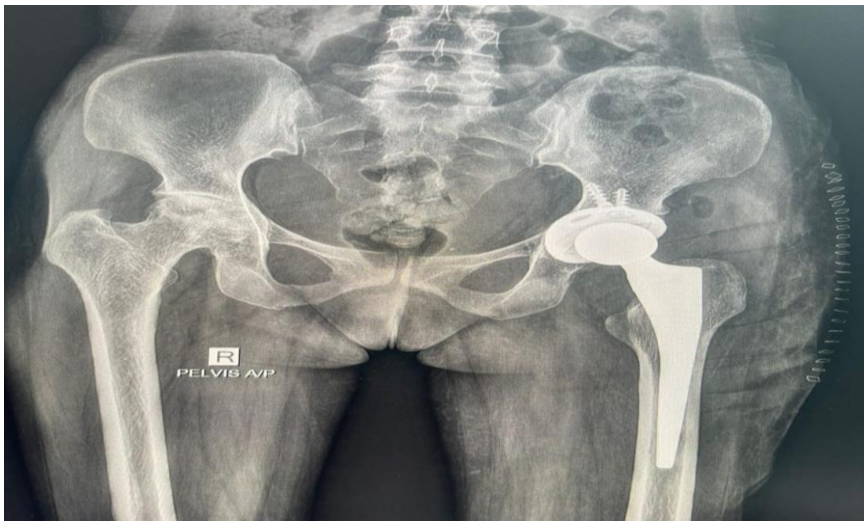

Figure – 5: X-ray of Pelvis and both Hip Joints (AP View) with Right Total Hip Replacement (Pre-Operative)