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Single stage bilateral total hip replacement new era of government hospital in Bangladesh

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Abstract

Background: Single-stage bilateral total hip replacement (THR) is an advanced surgical technique aimed at addressing severe bilateral hip degeneration. It offers improved mobility, pain relief, and functional recovery in a single operative session, reducing the need for multiple hospitalizations and rehabilitation periods. This procedure is particularly valuable for patients with advanced bilateral hip disease who may face challenges associated with undergoing two separate surgeries. However, its success depends on meticulous surgical planning and perioperative management. This study evaluates the functional outcomes, safety, and feasibility of implementing single-stage bilateral THR in a government hospital setting in Bangladesh, where access to advanced orthopedic care is often limited.

Methods: This retrospective study was conducted at the National Institute of Traumatology and Orthopaedic Rehabilitation, Bangladesh, including 25 patients (50 hips) with severe hip degeneration who underwent single-stage bilateral THR. Functional outcomes were assessed using the Harris Hip score (HHS) pre-operatively and at a minimum follow-up of 12 months. Post-operative complications and their management were recorded. Data were analyzed using the Statistical Packages for the Social Sciences version 26, with statistical significance set at $P < 0.05$.

Results: The mean pre-operative HHS of 32.13 ± 3.64, reflecting poor hip function, significantly improved to 85.23 ± 7.62 post-operatively ($P < 0.05$). Outcomes were excellent in 44%, good in 28%, fair in 20%, and poor in 8% of hips. Complications included one superficial infection (2.5%) and three femoral fractures (7.5%), all managed successfully. No dislocations, thromboembolic events, or significant bleeding were reported.

Conclusion: Single-stage bilateral THR in a government hospital setting is a safe, effective, and accessible intervention for advanced hip degeneration. The procedure yields significant functional improvements with minimal complications, demonstrating its potential to transform orthopedic care in resource-limited settings, such as Bangladesh.

Keywords: Bangladesh, Harris Hip score, orthopedic surgery, single-stage bilateral total hip replacement

Introduction

Total hip replacement (THR) surgeries are a common treatment modality for primary and secondary arthritic conditions of the hip. The number of THR surgeries is increasing and is expected to rise further worldwide, including in developing countries.[1-3] THR has been established as a proven method to enhance the quality of life, offering significant pain relief and high levels of patient satisfaction.[4-7] However, much of the existing literature on THR outcomes is primarily derived from Western countries, which may not adequately reflect the experiences in different socio-economic and healthcare settings.

In Bangladesh, THR has traditionally been more accessible in private healthcare facilities or abroad, limiting access for many due to financial and logistical barriers. The advent of single-stage bilateral THR in government hospitals marks a significant step toward making this transformative surgical intervention more accessible to the general population. This study focuses on the outcomes of single-stage bilateral THR in a government hospital setting in Bangladesh, shedding light on its potential to improve functional outcomes and quality of life for patients in this emerging healthcare landscape.

Methods

This retrospective study was conducted at the National Institute of Traumatology and Orthopedic Rehabilitation, Dhaka, Bangladesh, to evaluate the outcomes of single-stage bilateral THR performed in a government hospital setting. A total of 25 patients (50 hips) with severely degenerated hips were included in the study. Patients were followed up for at least 12 months post-operatively. The study period spanned from [January 2023 to December 2023]. Ethical approval was obtained from the institutional review board, and informed consent was taken from all patients pre-operatively. Inclusion criteria comprised patients aged 18 years or older with bilateral hip degeneration requiring THR who consented to surgery and follow-up. Patients below 18 years of age, those with acute polytrauma, or patients lost to follow-up within 12 months were excluded.

All surgeries were performed under combined spinal and epidural anesthesia, with patients placed in the lateral decubitus position. A modified Hardinge approach (anterolateral) was used for 45 hips, while a posterior approach was employed for 5 hips based on surgical discretion. Prophylactic intravenous antibiotics were administered pre-operatively and continued post-operatively to prevent infections. Post-operative rehabilitation included immediate quadriceps strengthening exercises, as well as foot and ankle exercises. From the 3rd post-operative week, abductor strengthening exercises were introduced for patients treated with the anterolateral approach. Wound care involved inspections on the 5th post-operative day, with sutures or staples removed on the 14th day.

Follow-up assessments were conducted at 6 weeks, 12 weeks, 6 months, and 1 year post-operatively, with annual follow-ups or earlier consultations as necessary. Functional outcomes and quality of life were measured using the Harris Hip score (HHS) at each follow-up. Data, including demographic information, pre-operative clinical evaluations, surgical details, and post-operative progress, were recorded and analyzed using the Statistical Packages for the Social Sciences version 26. Descriptive statistics and paired *t*-tests were used to compare pre-operative and post-operative HHS, with statistical significance set at $P < 0.05$. This study aims to provide insights into the functional outcomes and quality-of-life improvements achieved through single-stage bilateral THR, highlighting its potential as an effective and accessible orthopedic intervention in a government hospital setting in Bangladesh.

Results

A total of 25 patients (50 hips) were included in this study. Of these, 14 (56%) were female, and 11 (44%) were male. The mean age of the patients was 50.6 years, with a range of 22–79 years. The

most common indication for THR was primary osteoarthritis, accounting for 75% of cases (38 hips). Other etiologies included post-traumatic osteoarthritis (12.5%, 6 hips), rheumatoid arthritis (7.5%, 4 hips), and avascular necrosis of the femoral head (5%, 2 hips) [Table 1].

The HHS was used to evaluate functional outcomes pre-operatively and post-operatively. The mean pre-operative HHS was 32.13 ± 3.64, indicating poor hip function. At the latest follow-up, conducted at a mean of 12 months post-operatively (range: 6–18 months), the mean HHS improved significantly to 85.23 ± 7.62 [Table 2]. This improvement in hip function was statistically significant ($P < 0.05$).

Based on the post-operative HHS, outcomes were categorized as follows: 22 hips (44%) had excellent results, 14 hips (28%) had good results, 10 hips (20%) had fair results, and 4 hips (8%) had poor results [Figure 1].

Table 3 highlights the low complication rates associated with single-stage bilateral THR in this study, underscoring the procedure's safety and efficacy. Among the major complications, only one case (2.5%) of superficial infection was recorded, which was successfully managed conservatively with antibiotics, and no cases of pulmonary embolism, myocardial infarction, stroke, or revision surgery for implant loosening were observed. Minor complications were limited to three cases (7.5%) of intraoperative femoral fractures, which were appropriately managed with cerclage wiring and bone grafting. Notably, no cases of hematoma, deep vein thrombosis, urinary tract infection, pressure sores, dislocations, heterotopic ossifications, or iliopsoas irritation were reported, reflecting the effectiveness of meticulous surgical techniques and post-operative care protocols. These findings emphasize the procedure's safety and feasibility in a government hospital setting, with no life-threatening or severe adverse events recorded during the follow-up period. The results demonstrate that single-stage bilateral THR can be successfully implemented with minimal complications, even in resource-constrained environments.

Table 1: Demographic and etiological data of patients

Parameter	*n* (%)
Male	11 (44)
Female	14 (56)
Etiology of hip osteoarthritis	
Primary osteoarthritis	38 (75)
Post-traumatic osteoarthritis	6 (12.5)
Rheumatoid arthritis	4 (7.5)
Avascular necrosis	2 (5)

Table 2: Comparison of HHS pre- and post-operatively

Parameter	Preoperative HHS	Post-operative HHS
Mean±SD	32.13±0.58	85.23±1.20
Median	31.50	85.00
Min-Max	25–40	50–95

HHS: Harris hip scores

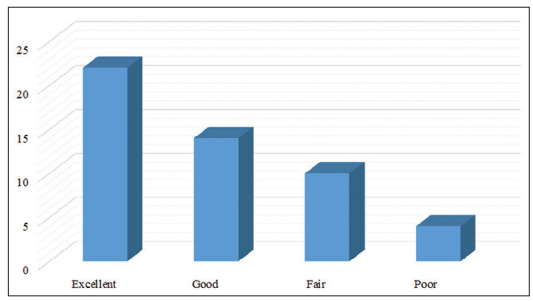

Figure 1: Distribution of outcomes based on Harris hip scores

Discussion

The implementation of a single-stage bilateral THR in a Bangladeshi government hospital represents a critical turning point in the delivery of high-quality, easily accessible orthopedic care. This study shows how this procedure can revolutionize public healthcare services by assessing its functional outcomes, safety, and viability in a resource-constrained environment.

The study demonstrated significant improvements in functional outcomes as measured by the HHS.

Table 3: Complications and their management after single-stage bilateral total hip replacement

Complication	Rate/occurrences in the study
Major (Total 2.5%)	1/40 (2.5%)
Death	0
Pulmonary embolism	0
Myocardial infarction	0
Deep-seated infection	1 (Superficial only, managed conservatively)
Stroke	0
Revision surgery for implant loosening	0
Minor (Total 8%)	3/40 (8%)
Hematoma	0
Deep vein thrombosis	0
Urinary tract infection	0
Pressure sore	0
Dislocation	0
Re-operation for femoral fracture	3 (Femoral fractures managed appropriately)
Heterotopic ossifications	0
Iliopsoas irritation	0

The mean HHS increased from 32.13 ± 3.64 pre-operatively, reflecting poor hip function, to 85.23 ± 7.62 post-operatively, indicating excellent functional recovery. These findings are consistent with previous research reporting substantial improvements in pain relief, mobility, and quality of life following THR.[8,9] The results distribution, with 44% of hips achieving excellent outcomes and only 8% classified as poor, highlights the effectiveness of single-stage bilateral THR in addressing severe hip degeneration.

The procedure showed a low complication rate, affirming its safety in a government hospital setting. Only one major complication (2.5%), a superficial infection, was recorded and managed conservatively with antibiotics. Although this rate is slightly higher than the <1% infection rates reported in high-volume centers globally, it reflects the effectiveness of post-operative management protocols in mitigating severe outcomes.[10] Minor complications included three cases of intraoperative femoral fractures (7.5%), which were successfully managed with cerclage wiring and bone grafting. These fractures did not adversely affect post-operative recovery. The absence of dislocations, deep vein thrombosis, or thromboembolic events emphasizes the robustness of the surgical technique and perioperative care, consistent with prior findings highlighting the importance of meticulous surgical planning and thromboprophylaxis.[11,12]

Post-operative bleeding, a common concern in joint replacement surgeries, was effectively managed with a single pre-operative dose of tranexamic acid (1 g). This approach aligns with previous research demonstrating the efficacy of tranexamic acid in minimizing perioperative blood loss.[13,14] Furthermore, venous thromboembolism prophylaxis using enoxaparin (40 mg subcutaneously for 1 week) resulted in no thromboembolic complications during follow-up, supporting its use in reducing the risk of such events.[12,15] This study highlights the potential of single-stage bilateral THR to enhance orthopedic care in government hospitals in developing countries. The procedure's success in achieving significant functional improvements and its low complication rates underscore its feasibility in resource-limited settings. The ability to provide advanced surgical interventions at a lower cost can reduce the financial burden on patients and broaden access to life-changing treatments.

A plain radiograph of the figure 2 pelvis in anteroposterior (AP) view demonstrates bilateral avascular necrosis (AVN) of the femoral heads. The image reveals typical features including flattening, sclerosis, and subchondral lucency ("crescent sign") of both femoral heads,. Joint space narrowing and collapse of the femoral head are also present.

A subsequent post-operative X-ray of the pelvis figure 3 shows the outcome of an uncemented total hip replacement (THR) performed on the both side single stage . The radiograph reveals a well-aligned uncemented femoral stem and

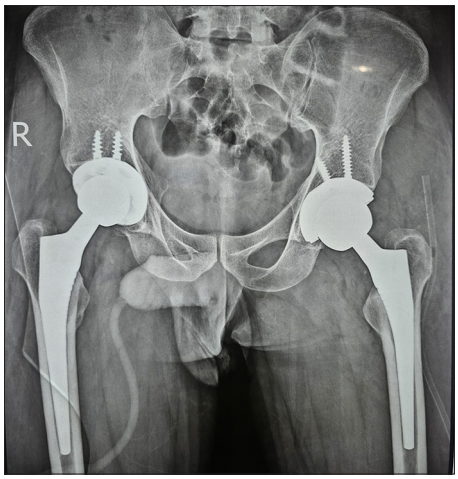

Figure 2: Uncemented THR x ray bony pelvis A/P view

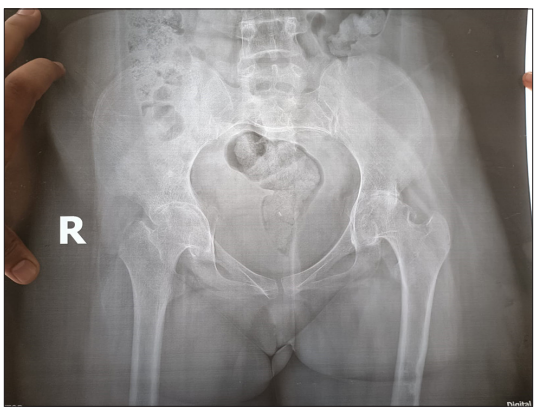

Figure 3: X ray bony pelvis A/P view (bilateral AVN hip)

acetabular cup with appropriate orientation and positioning. There is no evidence of periprosthetic fracture, dislocation, or loosening. The femoral and acetabular components show satisfactory fit, and the bone-implant interface appears stable, indicating good initial fixation.

This radiological progression underscores the natural course of advanced AVN leading to hip arthroplasty. The uncemented approach is particularly favorable in younger patients with adequate bone stock, offering long-term fixation through biological osseointegration. Serial imaging remains essential for assessing AVN progression and post-operative implant integrity.

Limitations of the study

While the study demonstrates promising results, certain limitations should be noted. The relatively small sample size of 25 patients and the short follow-up period of 12 months restrict the generalizability of the findings and limit the assessment of long-term implant survival. Future studies with larger cohorts and extended follow-up durations are essential to validate these results and explore long-term outcomes, such as implant durability and patient satisfaction.

Conclusion

The study's conclusions support the use of single-stage bilateral THR in a Bangladeshi government hospital as a secure, practical, and affordable treatment for advanced hip degeneration. The procedure's significant functional improvements and low complication rates show how it has the potential to transform public orthopedic care and increase access to cutting-edge surgical solutions in settings with limited resources.

References

1. Dixon T, Shaw M, Ebrahim S, Dieppe P. Trends in hip and knee joint replacement: Socioeconomic inequalities and projections of need. Ann Rheum Dis 2004;63:825-30.
2. Maradit Kremers H, Larson DR, Crowson CS, Kremers WK, Washington RE, Steiner CA, *et al*. Prevalence of total hip and knee replacement in the United States. J Bone Joint Surg Am 2015;97:1386-97.
3. Pedneault C, St George S, Masri BA. Challenges to implementing total joint replacement programs in developing countries. Orthop Clin North Am 2020;51:131-9.
4. Konopka JF, Lee YY, Su EP, McLawhorn AS. Quality-adjusted life years after hip and knee arthroplasty: Health-related quality of life after 12,782 joint replacements. JBJS Open Access 2018;3:e0007.
5. Ng CY, Ballantyne JA, Brenkel IJ. Quality of life and functional outcome after primary total hip replacement. A five-year follow-up. J Bone Joint Surg Br 2007;89-B:868-73.
6. Da Silva RR, Santos AA, De Sampaio Carvalho Júnior J, Matos MA. Quality of life after total knee arthroplasty: Systematic review. Rev Bras Ortop 2014;49:520-7.

7. Bachmeier CJ, March LM, Cross MJ, Lapsley HM, Tribe KL, Courtenay BG, *et al*. A comparison of outcomes in osteoarthritis patients undergoing total hip and knee replacement surgery. Osteoarthritis Cartilage 2001;9:137-46.
8. Laupacis A, Bourne R, Rorrabeck C, Feeny D, Wong C, Tugwell P, *et al*. The effect of elective total hip replacement on health-related quality of life. J Bone Joint Surg Am 1993;75:1619-26.
9. Rissanen P, Aro S, Slatis P, Sintonen H, Paavolainen P. Health and quality of life before and after hip or knee arthroplasty. J Arthroplasty 1995;10:169-75.
10. Ververeli PA, Lebby EB, Tyler C, Fouad C. Evaluation of reducing postoperative hip precautions in total hip replacement: A randomized prospective study. Orthopedics 2009;32:889.
11. Soong M, Rubash HE, Macaulay W. Dislocation after total hip arthroplasty. J Am Acad Orthop Surg 2004;12:314-21.
12. Lieberman JR, Pensak MJ. Prevention of venous thromboembolic disease after total hip and knee arthroplasty. J Bone Joint Surg Am 2013;95:1801-11.
13. Hourlier H, Fennema P. Single tranexamic acid dose to reduce perioperative morbidity in primary total hip replacement: A randomised clinical trial. Hip Int 2014;24:63-8.
14. Konig G, Hamlin BR, Waters JH. Topical tranexamic acid reduces blood loss and transfusion rates in total hip and total knee arthroplasty. J Arthroplasty 2013;28:1473-6.
15. Jain V, Dhal AK, Dhaon BK, Pradhan G. Deep vein thrombosis after total hip arthroplasty in Indian patients with and without enoxaparin. J Orthop Surg (Hong Kong) 2004;12:173-7.