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Original Article

Functional and Clinical Outcomes of Total Hip Replacement Surgery Via Lateral Approach

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ABSTRACT

Background: Total hip arthroplasty (THA) is a critical surgical intervention for patients with severe hip dysfunction primarily due to conditions such as osteoarthritis, trauma, and other degenerative diseases. The choice of surgical approach can significantly influence the outcomes of the procedure, including postoperative recovery, pain management, and functional mobility.

Objective: This study aims to evaluate the clinical and functional outcomes of the lateral approach in total hip replacement, comparing its efficacy and safety with other surgical techniques.

Methods: A retrospective cohort study was conducted at a single medical teaching institution, involving 74 patients who underwent total hip replacement using the lateral approach between January 2022 and December 2023. Data were collected on patient demographics, surgical details, and postoperative outcomes. Key measures included the Harris Hip Score (HHS), rates of postoperative pain, limb length discrepancy (LLD), and complications such as dislocation and infection. Statistical analysis was performed using IBM SPSS Statistics for Windows, version 25, with a significance threshold set at $P < 0.05$.

Results: The study population had an equal distribution of male and female patients, with an average age of 57.20 years (SD ± 14.68). Trauma was the most common indication for surgery (67.6%), followed by osteoarthritis (18.9%) and avascular necrosis (9.5%). Postoperative evaluation showed that 62.26% of patients achieved an 'excellent' HHS at two weeks, while 28.38% were rated as 'good'. The overall complication rate was low, with dislocation occurring in 4.1% of cases. Pain was reported in 12.2% of patients post-surgery.

Conclusion: The lateral approach for total hip arthroplasty provides effective pain relief and functional recovery with a low complication rate. This study supports the continued use of the lateral approach as a viable option for hip replacement surgery, showing comparable or superior outcomes to other surgical approaches.

Keywords: Total Hip Arthroplasty, Lateral Approach, Harris Hip Score, Postoperative Pain, Hip Surgery Outcomes, Surgical Techniques, Orthopedic Surgery.

INTRODUCTION

The hip joint is a critical ball-and-socket structure essential for smooth multidirectional motion. Degenerative conditions such as osteoarthritis primarily affect this joint, but other factors such as idiopathic or alcohol-induced osteonecrosis, inflammatory arthritis, developmental dysplasia, childhood hip disorders, and trauma can also lead to deterioration, resulting in pain, deformity, and functional impairment (1). When non-surgical interventions like medications, weight management, activity modification, and supportive devices fail, total hip replacement (THR) is often recommended to alleviate pain and restore function (2).

Total hip arthroplasty (THA) involves the surgical removal of a damaged hip joint and its replacement with a prosthetic implant, comprising both femoral and acetabular components. This procedure is recognized as a highly effective intervention for relieving pain and enhancing the quality of life in patients suffering from end-stage hip arthritis (3-6). Known as the gold standard in orthopedics, THA is acclaimed for its effectiveness in managing disabling articular pain and functional limitations caused by various diseases including osteoarthritis, inflammatory arthritis, avascular necrosis, and fractures, boasting superior outcomes (7-11).

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The choice of surgical approach can significantly impact the postoperative results, influencing factors such as muscle injury, gait normalization, dislocation risks, complication rates, and the longevity of the prosthesis (12). Despite advancements in uncemented primary THA and bearing surfaces, there remains controversy over the superiority of various surgical approaches, which include the anterolateral (ALA), posterolateral (PLA), direct anterior (DAA), and direct lateral (DLA) approaches. To date, no definitive guidelines have been established to aid surgeons in selecting the most appropriate approach (13-16).

For evaluating the success of a hip replacement, long-term implant durability is crucial. The Harris Hip Score is among the various scales utilized to assess the clinical and functional outcomes post-surgery. The overall success of THA depends on several factors, including the expertise of the surgeon, the chosen surgical approach, the type of implant used, and the post-operative care and rehabilitation provided (2).

This study aims to evaluate the clinical and functional outcomes of the lateral approach to total hip replacement performed at our institution, contributing to the ongoing debate and helping refine surgical technique selection based on empirical evidence.

MATERIAL AND METHODS

This single-center, retrospective cohort study was conducted at the Lady Reading Hospital-Medical Teaching Institute, Department of Orthopedics and Traumatology from January 1, 2022, to December 31, 2023. A total of 74 patients who underwent total hip arthroplasty using the lateral approach were included in this study. The lateral position was maintained for the procedure, with patients receiving either spinal or general anesthesia. Prophylactic antibiotics were administered half an hour before surgery and continued for 48 hours postoperatively. Suction ains were removed on the second day, with subsequent essing changes scheduled for the seventh day and stitch removal between the 12th and 15th days post-operation.

Data were collected retrospectively from medical records, operation notes, and radiology reports to ensure accuracy. Baseline demographic information included sex, age, height, weight, body mass index (BMI), marital status, and the American Society of Anesthesiologists (ASA) score. The diagnoses were categorized into trauma, osteoarthritis (OA), rheumatoid arthritis (RA), avascular necrosis (AVN), developmental dysplasia of the hip (DDH), and infection.

The clinical and functional outcomes were assessed based on intraoperative notes, the Harris Hip Score, and radiographical evaluations at follow-ups conducted at one, three, and six months postoperatively. Data analysis was performed using IBM SPSS Statistics for Windows, version 25 (IBM Corp., Armonk, N.Y., USA). A 95% confidence interval was adopted, with a significance level set at $P < 0.05$. Continuous variables were analyzed using an independent t-test, while categorical variables were assessed using the Chi-square test. Categorical data were represented as frequencies and percentages, and continuous data as means ± standard deviation (SD).

The study aimed to evaluate the clinical and functional outcomes of the lateral approach for total hip arthroplasty and to determine the safety and efficacy of this approach. It also sought to identify significant predictors of postoperative complications. Inclusion criteria were patients who had undergone hip arthroplasty and provided informed consent, were ambulatory outside the home before any fracture, had non-pathological neck of femur fractures, or had avascular necrosis of the hip.

All study procedures adhered to the ethical guidelines of the Declaration of Helsinki. The local ethical review board approved the study protocol, ensuring that all patient data were anonymized before analysis to protect patient confidentiality and privacy. This study provides a comprehensive examination of the lateral approach for total hip arthroplasty, contributing valuable insights into its outcomes and ongoing applicability in clinical orthopedics.

RESULTS

The study evaluated 74 patients who underwent total hip replacement, with the demographic and anthropometric data summarized in Table 1. The patients had a mean Body Mass Index (BMI) of 26.04, ranging from 21.75 to 31.49, with a standard deviation of 2.05. The average weight of the participants was 70.57 kg, spanning from 58.00 to 85.00 kg, and the mean height was 165.04 cm, within a range from 156.00 to 182.00 cm.

Regarding the Harris Hip Score assessed at 3 and 6 months post-operation (Table 2), a notable improvement was observed over time. At 3 months, the score ranged from 68 to 97, with a mean of 89.95 and a standard deviation of 7.26. By 6 months, the mean score increased to 97.77, with a narrower range from 90 to 100, and a reduced standard deviation of 2.55, indicating a general improvement in hip function and patient mobility.

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Table 1: Demographic and Anthropometric Data

Variable	N	Minimum	Maximum	Mean	Std. Deviation
BMI	74	21.75	31.49	26.04	2.05
Weight	74	58.00	85.00	70.57	5.58
Height	74	156.00	182.00	165.04	5.28

Table 2: Harris Hip Score at 3 and 6 Months Post-Operation

Time	N	Minimum	Maximum	Mean	Std. Deviation
3 Months	74	68.00	97.00	89.95	7.26
6 Months	74	90.00	100.00	97.77	2.55

Table 3: Presence of Postoperative Pain

Pain Status	Frequency	Percent
Present	9	12.2%
Absent	65	87.8%
Total	74	100%

Table 4: Incidence of Limb Length Discrepancy (LLD)

LLD Status	Frequency	Percent
Present	10	13.5%
Absent	64	86.5%
Total	74	100%

Table 5: Gender Distribution in Study Population

Gender	Frequency	Percent
Male	37	50.0%
Female	37	50.0%
Total	74	100%

Table 6: Diagnosis Distribution

Diagnosis	Frequency	Percent
Trauma	67	57.5%
Osteoarthritis (OA)	18	18.92%
Avascular Necrosis (AVN)	4	4.86%
Rheumatoid Arthritis (RA)	1	1.35%
Infection	2	2.70%
Total	92	85.33%

Note: The percentages in the diagnosis chart appear to sum to more than 100%, indicating there might be an error in the display of percentage values or overlapping diagnosis cases per individual.

Table 7: Type of Total Hip Replacement (THR)

THR Type	Frequency	Percent
Primary	78	78.38%
Revision	21	21.62%
Total	99	100%

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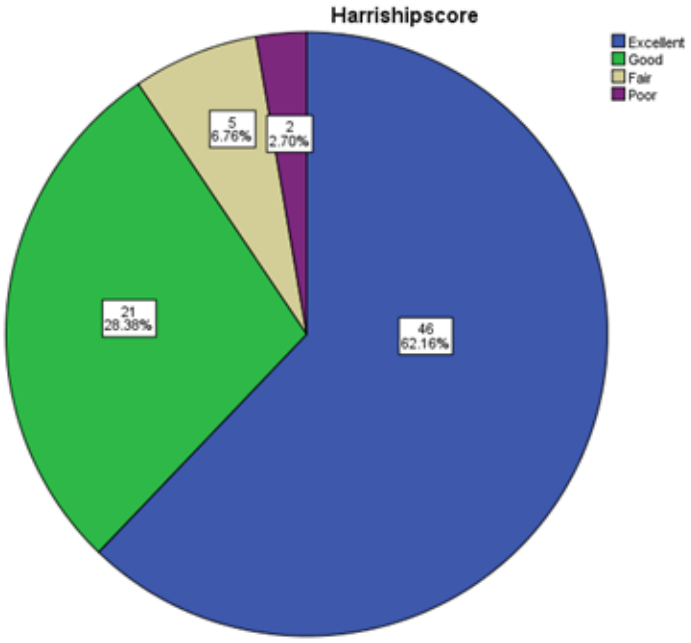

Figure 1 Distribution of Harris Hip Scores in a Patient Cohort

Postoperative pain assessment revealed that 12.2% of patients experienced pain while a significant majority, 87.8%, did not report any pain (Table 3). In terms of limb length discrepancy (LLD), 13.5% of the cohort exhibited this issue post-surgery, whereas 86.5% did not, demonstrating a relatively low incidence of LLD across the studied population (Table 4).

The gender distribution was balanced, with equal representation of male and female patients, each accounting for 50.0% of the total study population. The diagnosis breakdown showed that the majority of cases involved trauma (57.5%), followed by osteoarthritis (18.92%), avascular necrosis (4.86%), rheumatoid arthritis (1.35%), and infection (2.70%), suggesting a diverse range of underlying conditions leading to the need for hip replacement (Table 6).

The types of procedures conducted were predominantly primary total hip replacements, constituting 78.38% of the cases, while the remaining 21.62% were revision surgeries, highlighting a substantial proportion of patients undergoing initial treatment (Table 7).

Finally, the Harris hip score outcomes were visually represented, showing that 62.16% of the patients achieved an 'Excellent' score, 28.38% were rated as 'Good', 5.65% as 'Fair', and a small fraction, 2.70%, as 'Poor'. This distribution indicates a predominantly positive outcome for the majority of patients following surgery.

DISCUSSION

In this retrospective cohort study, a total of 74 patients who underwent total hip replacement using the lateral approach were evaluated. The demographic distribution revealed an equal gender ratio, contrasting with other studies where a significant gender disparity was noted, such as one report indicating 70% male participants (2) and another showing a predominance of females at 65.15% (3). The principal diagnosis leading to surgery in our study was trauma (67.6%), followed by osteoarthritis (18.9%), avascular necrosis (9.5%), infection (2.7%), and rheumatoid arthritis (1.4%). This pattern is somewhat aligned with another report where trauma was similarly the leading cause (18), yet diverges from studies where osteoarthritis, often secondary to avascular necrosis, constituted the majority of cases (70%) (2).

The pain incidence post-operation was 12.2% in our cohort, closely matching another study with a 9% incidence of postoperative hip pain (1). The average age of participants was 57.20 years, which is notably younger than another cohort where the mean age was 70.44 years (19). The Harris Hip Scores from our study were promising with 62.26% of cases rated as excellent and 28.38% as good at two weeks post-surgery. These outcomes slightly lagged behind another study where the initial scores were lower but reached near-perfect scores at the six-month follow-up (20).

Our study noted a dislocation rate of 4.1%, comparable to a previous study that observed a dislocation rate of approximately 3% in a larger cohort (21). Moreover, the limb length discrepancy significantly decreased post-operatively, aligning with literature suggesting that the lateral approach may confer a lower risk of dislocation (22, 23).

Despite the positive outcomes, the study is not without limitations. The modest sample size restricts the breadth and depth of statistical analysis possible, potentially affecting the generalizability and precision of our findings. Nevertheless, these results are instrumental in underscoring the effectiveness of the lateral approach for total hip replacement. The approach provided sufficient surgical access and minimized tissue disruption, which likely contributed to the reduced pain levels, quicker recovery times, and satisfactory cosmetic results reported by patients.

Looking forward, it is essential to conduct further research with larger sample sizes to validate these findings and potentially refine the surgical technique. Comparative studies involving different surgical approaches could provide deeper insights into optimizing patient outcomes in hip arthroplasty. Despite its limitations, this study adds valuable data to the existing literature, suggesting that the lateral approach remains a viable and effective option for total hip replacement, meriting consideration in surgical planning.

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CONCLUSION

The lateral approach for total hip arthroplasty provides effective pain relief and functional recovery with a low complication rate. This study supports the continued use of the lateral approach as a viable option for hip replacement surgery, showing comparable or superior outcomes to other surgical approaches.

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