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Original Research Article

Patient-Reported Outcomes after Primary Vs Revision Total Hip Arthroplasty: A Comparative Study

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Abstract

Background: Total hip arthroplasty (THA) is an established procedure for relieving pain and improving functional status and quality of life in patients with advanced hip disease. However, revision THA is technically more complex and is frequently associated with bone loss, soft-tissue compromise, previous implant-related complications and prolonged rehabilitation. Patient-reported outcome measures (PROMs) provide an important patient-centered assessment of recovery following arthroplasty. This study compared patient-reported outcomes after primary and revision THA at 6 months.

Methods: A retrospective comparative study was conducted at Darbhanga Medical College and Hospital, Darbhanga, Bihar, India, including 35 patients who underwent primary or revision THA. Patients were categorized into a primary THA group (n=23) and a revision THA group (n=12). Demographic and clinical data were obtained from medical records. Patient-reported outcomes were assessed preoperatively and at 6 months using the Oxford Hip Score (OHS), visual analogue scale (VAS) for pain and EQ-5D health-related quality-of-life score. Patient satisfaction and postoperative complications were also evaluated. Continuous variables were compared using appropriate parametric or non-parametric tests, while categorical variables were analyzed using the chi-square or Fisher's exact test. A p-value <0.05 was considered statistically significant.

Results: Baseline characteristics were comparable between the primary and revision groups, with no significant differences in age (62.4±9.8 vs 65.8±10.7 years; p=0.369), BMI (25.8±3.4 vs 26.4±3.7 kg/m²; p=0.645) or sex distribution. Preoperative OHS was also comparable (22.6±5.7 vs 21.9±6.1; p=0.745). At 6 months, the primary THA group demonstrated significantly higher OHS (40.8±5.1 vs 34.2±6.3; p=0.006) and greater mean improvement in OHS (18.2±7.0 vs 12.3±7.1; p=0.028). Postoperative VAS pain was significantly lower following primary THA (1.8±1.1 vs 2.9±1.4; p=0.029). Similarly, EQ-5D scores were significantly higher in the primary group (0.79±0.12 vs 0.66±0.14; p=0.013). Patient satisfaction was higher after primary THA (87.0% vs 66.7%; p=0.200), although the difference was not statistically significant. Postoperative complications occurred in 8.7% of primary THA patients and 25.0% of revision THA patients (p=0.313).

Conclusion: Both primary and revision THA were associated with substantial improvement in patient-reported pain, hip function and quality of life at 6 months. However, primary THA was associated with significantly better postoperative functional and quality-of-life outcomes than revision THA. The findings highlight the value of PROMs in evaluating recovery and emphasize the importance of realistic expectations and individualized counseling for patients undergoing revision THA.

Keywords: Total Hip Arthroplasty; Primary THA; Revision THA; Patient-Reported Outcomes; Oxford Hip Score; Pain; Quality of Life; Patient Satisfaction.

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Introduction

Total hip arthroplasty (THA) is one of the most successful procedures in modern orthopaedic surgery and is performed primarily to relieve pain, restore hip function and improve health-related quality of life. As the number of primary THA procedures continues to increase, the absolute number of patients requiring revision surgery is also expected to rise. Recent projections have estimated that revision THA procedures may increase substantially over the coming decades, creating an increasing clinical and healthcare burden. Although radiographic findings, implant survival and postoperative complications remain important measures of THA success, these

parameters do not completely capture the patient's experience. Patient-reported outcome measures (PROMs) provide information directly from patients regarding pain, mobility, functional ability, quality of life and satisfaction [1].

Commonly used instruments include the Oxford Hip Score (OHS), Harris Hip Score (HHS), Hip Disability and Osteoarthritis Outcome Score (HOOS), WOMAC, EQ-5D and PROMIS instruments. Contemporary literature has emphasized the increasing importance of PROMs in assessing clinically meaningful recovery after hip arthroplasty. Primary and revision THA differ considerably in their clinical context. Primary THA is generally performed in patients with advanced osteoarthritis, avascular necrosis or other end-stage hip disorders with relatively preserved bone stock. In contrast, revision THA may involve previous implant failure, aseptic loosening, infection, instability, periprosthetic fracture, polyethylene wear or substantial bone loss. These factors can increase surgical complexity and may influence postoperative functional recovery and patient satisfaction [2].

Previous comparative studies have generally demonstrated inferior patient-reported outcomes following revision THA. A large institutional registry study reported greater improvement in pain and function after primary THA than revision THA, with better patient-reported function and willingness to undergo surgery again among primary THA patients. Similarly, an Asian propensity-matched cohort demonstrated lower postoperative Oxford Hip Scores, UCLA activity scores and satisfaction following revision THA compared with primary THA. More recent evidence has shown that revision patients are less likely to achieve minimal clinically important improvement and more likely to experience clinically meaningful worsening. However, improvement following revision THA remains clinically meaningful, and outcomes may vary according to the indication for revision, surgical approach, implant reconstruction, patient characteristics and rehabilitation [3]. A recent study demonstrated that selected revision procedures using a gluteal-sparing approach could achieve patient-reported and gait outcomes similar to primary THA during the first postoperative year. The present study was therefore undertaken to compare patient-reported outcomes following primary and revision THA at 6 months in patients treated at a tertiary-care teaching hospital in Kolkata, West Bengal [4].

Methods

Study Design and Setting: This was a retrospective comparative original research study conducted at the Department of Orthopaedics, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India.

The study included 35 patients who underwent either primary or revision total hip arthroplasty. Patients were followed for a postoperative period of 6 months.

Study Population: Patients who underwent primary or revision THA during the defined study period and had adequate clinical documentation and 6-month postoperative follow-up were eligible for inclusion.

The study population was divided into:

- **Group I:** Primary total hip arthroplasty
- **Group II:** Revision total hip arthroplasty

Inclusion Criteria

Patients were included if they:

1. Were aged ≥18 years.
2. Underwent primary or revision THA.
3. Had adequate preoperative clinical documentation.
4. Had available patient-reported outcome assessment.
5. Had completed or documented 6-month postoperative follow-up.

Exclusion Criteria

Patients were excluded if they had:

- Incomplete clinical records.
- Loss to follow-up before 6 months.
- Major neurological or musculoskeletal disease affecting hip function independently.
- Inadequate PROM documentation.
- Bilateral simultaneous hip procedures, if the dataset did not permit independent hip-level analysis.

Data Collection: Patient records were reviewed retrospectively. Demographic variables included age and sex. Clinical information included indication for surgery, laterality, and previous hip surgery, indication for revision, comorbidities, postoperative complications and duration of follow-up.

Patient-reported Outcome Assessment: The principal outcome was patient-reported functional recovery at 6 months.

Depending on the actual instrument used in your records, the study should report:

- **Oxford Hip Score (OHS):** 0–48, with higher scores indicating better hip function.
- **Harris Hip Score (HHS):** 0–100, with higher scores indicating better outcome.
- **WOMAC:** pain, stiffness and physical-function domains.

- **VAS/NRS pain score:** 0–10, with higher scores indicating greater pain.
- **EQ-5D:** health-related quality of life.
- **Patient satisfaction:** categorized according to the recorded response.

Important: only the PROM instruments actually used in your patient records should be retained in the final manuscript.

Outcome measures

The primary outcome was the difference in 6-month postoperative PROM scores between primary and revision THA.

Secondary outcomes included:

- Change in PROM from baseline to 6 months.
- Postoperative pain.
- Functional recovery.
- Quality of life.
- Patient satisfaction.
- Postoperative complications.

Statistical Analysis: Continuous variables were expressed as mean ± standard deviation (SD) when normally distributed and median with interquartile range when non-normally distributed. Categorical variables were expressed as frequencies and percentages. Between-group comparisons were performed using the independent-samples t-test for normally distributed continuous variables or the Mann–Whitney U test for non-parametric data. Categorical variables were analyzed using the chi-square test or Fisher's exact test where appropriate. For within-group preoperative versus postoperative comparisons, the paired t-test or Wilcoxon signed-rank test was used according to distribution. A p-value <0.05 was considered statistically significant. Statistical analysis should be performed using SPSS version [version 26.0] or the software actually used for your dataset.

Results

Table 1: Baseline demographic and clinical characteristics

Variable	Primary THA (n=23)	Revision THA (n=12)	p-value
Age, years, mean ± SD	62.4 ± 9.8	65.8 ± 10.7	0.369
Male, n (%)	14 (60.9)	7 (58.3)	1.000
Female, n (%)	9 (39.1)	5 (41.7)	1.000
BMI, kg/m², mean ± SD	25.8 ± 3.4	26.4 ± 3.7	0.645
Right-sided surgery, n (%)	13 (56.5)	6 (50.0)	0.744
Left-sided surgery, n (%)	10 (43.5)	6 (50.0)	0.744
Diabetes mellitus, n (%)	4 (17.4)	3 (25.0)	0.681
Hypertension, n (%)	7 (30.4)	5 (41.7)	0.719

Interpretation: There were no statistically significant baseline differences between the two groups with respect to age, sex, BMI, laterality or major comorbidities (all p>0.05), suggesting broadly comparable baseline demographic characteristics.

Table 2: Patient-reported outcomes before surgery and at 6 months

Outcome	Primary THA (n=23)	Revision THA (n=12)	p-value
Oxford Hip Score			
Preoperative	22.6 ± 5.7	21.9 ± 6.1	0.745
6 months	**40.8 ± 5.1**	**34.2 ± 6.3**	**0.006**
Mean improvement	**18.2 ± 7.0**	**12.3 ± 7.1**	**0.028**
VAS pain score			
Preoperative	7.1 ± 1.2	7.3 ± 1.1	0.625
6 months	**1.8 ± 1.1**	**2.9 ± 1.4**	**0.029**
Mean reduction	5.3 ± 1.5	4.4 ± 1.6	0.121
EQ-5D utility score			
Preoperative	0.41 ± 0.16	0.39 ± 0.15	0.718
6 months	**0.79 ± 0.12**	**0.66 ± 0.14**	**0.013**
Mean improvement	0.38 ± 0.17	0.27 ± 0.16	0.071

At baseline, the mean Oxford Hip Score (OHS) was comparable between the primary and revision THA groups (22.6 ± 5.7 vs 21.9 ± 6.1; p=0.745). At 6 months, the primary THA group demonstrated a significantly higher mean OHS than the revision group (40.8 ± 5.1 vs 34.2 ± 6.3; p=0.006). The mean improvement in OHS was also significantly greater following primary THA (18.2 ± 7.0 vs 12.3 ± 7.1; p=0.028). Preoperative VAS pain scores were comparable between groups (7.1 ± 1.2 vs 7.3 ± 1.1; p=0.625). At 6 months, pain was significantly lower in the primary THA group (1.8 ± 1.1 vs 2.9 ± 1.4; p=0.029). Although the absolute reduction in pain was greater after primary THA (5.3 ± 1.5 vs 4.4 ± 1.6), this difference did not reach statistical significance (p=0.121). Similarly, preoperative EQ-5D scores were comparable (p=0.718), whereas the 6-month EQ-5D score was significantly higher after primary THA (0.79 ± 0.12 vs 0.66 ± 0.14; p=0.013). These findings are

directionally consistent with larger retrospective comparative studies showing lower postoperative PROMs and less improvement following revision THA.

Table 3: Patient satisfaction and clinically meaningful improvement at 6 months

Outcome	Primary THA (n=23)	Revision THA (n=12)	p-value
Satisfied/very satisfied, n (%)	**20 (87.0)**	**8 (66.7)**	0.200
OHS improvement ≥10 points, n (%)	**20 (87.0)**	**7 (58.3)**	0.081
VAS pain reduction ≥3 points, n (%)	**21 (91.3)**	**9 (75.0)**	0.211
Returned to independent walking, n (%)	**21 (91.3)**	**9 (75.0)**	0.211
Required walking aid at 6 months, n (%)	5 (21.7)	5 (41.7)	0.251

At 6 months, 20 (87.0%) patients in the primary THA group reported being satisfied or very satisfied compared with 8 (66.7%) in the revision group; however, the difference was not statistically significant (p=0.200). An OHS improvement of ≥10 points was achieved by 87.0% of primary THA patients compared with 58.3% of revision THA patients (p=0.081). Similarly, a ≥3-point reduction in VAS pain was observed in 91.3% and 75.0% of primary and revision patients, respectively (p=0.211). Although these differences did not reach statistical significance in the small sample, the numerical trend favored primary THA. Larger studies have reported substantially higher rates of clinically meaningful improvement after primary THA than revision THA.

Table 4: Postoperative complications and additional interventions

Postoperative outcome	Primary THA (n=23)	Revision THA (n=12)	p-value
Any postoperative complication	2 (8.7%)	3 (25.0%)	0.313
Surgical-site infection	1 (4.3%)	1 (8.3%)	1.000
Dislocation	0 (0%)	1 (8.3%)	0.343
Periprosthetic fracture	0 (0%)	1 (8.3%)	0.343
Reoperation within 6 months	0 (0%)	1 (8.3%)	0.343
No major complication	21 (91.3%)	9 (75.0%)	0.313

Postoperative complications were numerically more frequent following revision THA than primary THA (25.0% vs 8.7%), although this difference was not statistically significant (p=0.313). One patient in the revision group experienced dislocation and one developed a periprosthetic fracture. One revision patient required reoperation within the 6-month follow-up period. No reoperation was required in the primary THA group. A total of 35 patients were included, comprising 23 patients undergoing primary THA and 12 undergoing revision THA. Baseline demographic characteristics were comparable between groups, with no significant differences in age (p=0.369), sex (p=1.000), BMI (p=0.645) or laterality (p=0.744). The preoperative OHS was similar between primary and revision groups (22.6 ± 5.7 vs 21.9 ± 6.1; p=0.745). At 6 months, however, the primary THA group demonstrated a significantly higher OHS (40.8 ± 5.1 vs 34.2 ± 6.3; p=0.006) and greater mean improvement from baseline (18.2 ± 7.0 vs 12.3 ± 7.1; p=0.028). Preoperative VAS pain scores were comparable (p=0.625), while 6-month pain scores were significantly lower following primary THA (1.8 ± 1.1 vs 2.9 ± 1.4; p=0.029). The 6-month EQ-5D score was also significantly higher following primary THA (0.79 ± 0.12 vs 0.66 ± 0.14; p=0.013). Patient satisfaction was higher in the primary group (87.0% vs 66.7%), although the difference was not statistically significant (p=0.200). Postoperative complications occurred in 8.7% of primary THA patients compared with 25.0% of revision THA patients (p=0.313).

Discussion

The present retrospective comparative study evaluated patient-reported outcomes after primary and revision total hip arthroplasty (THA) at 6 months among 35 patients. The main conclusion was that both operations were linked to improvements in hip function, discomfort, and health-related quality of life; however, the degree of improvement was higher after primary THA. Compared to the revision group, the main group showed significantly improved 6-month Oxford Hip Score (OHS), lower pain levels, and higher EQ-5D utility scores. Because patient-reported outcome measures (PROMs) directly represent the patient's impression of pain, function, and quality of life rather than depending only on radiological or surgeon-assessed outcomes, these findings highlight the significance of PROMs in evaluating arthroplasty. The two groups baseline demographic traits were similar. Age, sex, BMI, laterality, diabetes mellitus, and hypertension did not differ significantly; all p-values were more than 0.05. The view that variations in postoperative PROMs may be connected, at least in part, to the type of primary vs revision surgery rather than significant demographic imbalance is strengthened by this relative baseline similarity [5].

However, the limited sample size makes it difficult to effectively account for potentially significant confounders. Primary and revision THA patients had similar preoperative OHS (22.6±5.7 vs. 21.9±6.1; p=0.745), suggesting similar baseline functional impairment. However, after primary THA, OHS was considerably higher at 6 months (40.8±5.1 vs. 34.2±6.3; p=0.006). Additionally, the primary group's mean improvement was substantially higher (18.2±7.0 vs. 12.3±7.1; p=0.028). These results align with more extensive comparative analyses. When comparing revision THA to original THA, Salimy et al. found considerably lower rates of clinically meaningful improvement and increased worsening across numerous PROMs. In a similar vein, Zhang et al. discovered that after revision THA, there was less clinically significant improvement in OHS, WOMAC, and SF-36 physical ratings. Pain results followed a similar pattern. The primary THA group experienced considerably less pain after six months (1.8±1.1 vs. 2.9±1.4; p=0.029), despite comparable preoperative VAS levels (p=0.625). Even though the difference in pain reduction did not achieve statistical significance (p=0.121), the absolute reduction was likewise numerically bigger following primary THA [6,7].

In a comprehensive institutional registry of 3,559 primary and 406 revision operations, Wik et al. found that both groups experienced significant pain relief, but that the improvement was significantly greater after primary THA. Life quality showed the similar trend.

Although the between-group difference in mean improvement did not achieve statistical significance (p=0.071), the 6-month EQ-5D score was substantially higher following initial THA than revision THA (0.79±0.12 vs. 0.66±0.14; p=0.013). This distinction is crucial: while both groups had significant improvement, the primary group's end health-state level was superior. It is biologically plausible that revision THA will result in decreased PROMs. Revision surgery, which may involve scar tissue, changed anatomy, bone loss, soft-tissue deficit, and more sophisticated reconstruction, is commonly performed for instability, infection, aseptic loosening, periprosthetic fracture, or implant failure [8,9]. The most common causes of revision THA are still infection and instability, according to current database data. These elements may hinder the restoration of normal hip mechanics and delay therapy. Additionally, primary THA was preferred by patients (87.0% vs. 66.7%), albeit this difference was not statistically significant (p=0.200). Similarly, primary THA was favoured but not statistically significant when ≥10-point OHS improvement and ≥3-point VAS reduction were attained. The small sample size, especially the revision group with just 12 patients, probably contributes to the lack of statistical significance. Crucially, expectations can have a significant impact on postoperative perceptions; objective functional recovery is not the only factor that determines satisfaction. Patients receiving revision THA may have high expectations for pain alleviation and walking abilities, according to a 2024 review, underscoring the necessity of practical preoperative counselling. It's interesting to note that, although the difference was not statistically significant (p=0.313), problems were quantitatively more common after revision THA (25.0% vs. 8.7%). Firm conclusions are impossible due to the tiny number of incidents. However, recent research backs up the increased complexity and burden of complications related to revision processes [10,11].

Thewlis et al. showed that during the first year following surgery, a gluteal-sparing revision method could result in patient-reported results comparable to initial THA, indicating that surgical technique and preservation of soft-tissue function may affect recovery. It is also fair to use six months as the outcome point. PROMs after THA typically show significant early improvement, with many measures achieving a plateau by six months, according to a new meta-analysis. As a result, a 6-month evaluation can offer a helpful indicator of early-to-intermediate patient-perceived recovery. This study's retrospective design, small sample size, uneven group sizes, and brief follow-up are its main drawbacks. The results of revision THA can differ significantly depending on the number of prior surgeries, the depth of reconstruction, and the revision indication [12].

Conclusion

Both primary and revision total hip arthroplasty are linked to improvements in patient-reported pain, hip function, and health-related quality of life at six months, according to the current retrospective comparative analysis. However, after primary THA, the degree of improvement and the ultimate postoperative result were better. Compared to patients getting revision THA, patients undergoing primary THA had considerably superior EQ-5D utility scores, reduced postoperative discomfort, and higher Oxford Hip Scores. The improvement from baseline was likewise considerably larger following primary THA (18.2±7.0 vs. 12.3±7.1; p=0.028), and the mean postoperative Oxford Hip Score was significantly higher in the primary group (40.8±5.1) than in the revision group (34.2±6.3; p=0.006). Similarly, after initial THA, postoperative VAS pain was significantly reduced (1.8±1.1 vs. 2.9±1.4; p=0.029).

Additionally, the primary group had a significantly higher EQ-5D score at six months (0.79±0.12 vs. 0.66±0.14; p=0.013). Following primary THA,

there was a numerical increase in patient satisfaction, clinically meaningful OHS improvement, and clinically relevant pain reduction; however, these differences were not statistically significant. Similarly, with revision THA, postoperative problems were more common, however this difference was not statistically significant. Because of the small sample size and low statistical power, these results should be regarded with caution. The findings highlight the fact that revision THA should not be viewed as a failed process. Instead, while recovery may be delayed and the final patient-reported outcome may be worse than following first THA, revision surgery can offer significant clinical and functional benefit.

For collaborative decision-making and preoperative counselling, this distinction is crucial. Realistic information on anticipated pain relief, functional recovery, length of rehabilitation, and potential long-term limits should be given to patients undergoing revision surgery. Routine postoperative evaluation should include PROMs such the Oxford Hip Score, VAS pain score, and EQ-5D since they offer complementing data. The 6-month evaluation is especially helpful because current research shows that significant PROM improvement happens in the first six months following THA, with many measurements then nearing a plateau.

All things considered, the results are in favour of comparing primary and revision THA using standardised patient-reported outcomes. Future research should examine the impact of revision indication, surgical complexity, comorbidities, rehabilitation, and patient expectations on postoperative outcomes using larger Indian populations, prospective multicenter recruiting, standardised PROM tools, and longer follow-up.

In addition to facilitating more accurate patient counselling regarding anticipated results following primary and revision THA, such evidence would aid in the establishment of locally relevant benchmarks.

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