Original Article

A Hospital-Based Prospective Study to Assess the Functional Outcome of Total Hip Arthroplasty in Patients with Inflammatory Arthropathy Using the Harris Hip Score at a Tertiary Care Centre

Sumer Singh Shekhawat[1], Pradeep Khinchi[1], Umesh Samria[1]

[1]Assistant Professor, Department of Orthopaedics, JLN Medical College, Ajmer, Rajasthan, India.

Abstract

Background: In individuals suffering from inflammatory arthropathies who already have spinal deformity, hip involvement significantly impairs their mobility and posture. Understanding the necessity of THA and its advantages for individuals receiving it depends on the good functional outcome of THA in patients with inflammatory arthropathies. The study's goal is to use the Harris hip score (HHS) to measure the functional result of THA in patients with inflammatory arthritis and to analyze the post-operative complications in these patients. **Material and Methods:** Twenty individuals with a diagnosis of Inflammatory Arthritis of the Hip participated in a prospective study aged from 18 to 80 years who received THA treatment at JLN Medical College's Department of Orthopaedics, Ajmer, Rajasthan, India during one-year period. The patients were evaluated clinically and radiologically before surgery and at 6 weeks, 12 weeks and 24 weeks. HHS was used to assess hip functional results at different intervals. **Results:** Our study showed that mean age of patients was 42.56±11.58 years, male to female ratio was 2.33:1. 15% of patients had outstanding results from the arthroplasty, 25% had medium results, 55% had decent results, and 5% had poor results. The average Harris Hip score difference before surgery was 7.458, after 12 weeks it was 10.89, and after 24 weeks it was 13.96. The Harris Hip score varied during the follow-up period in a statistically meaningful way. **Conclusion:** We concluded that patients with inflammatory arthritis who had limited activities of daily living showed improvements in short-term follow-up, ease of rehabilitation, and return to function with THA.

Keywords: THA, Inflammatory Arthritis, Harris Hip score, Functional outcome.

Received: 04 November 2025 **Revised: 28 November 2025** **Accepted: 14 December 2025** **Published: 31 December 2025**

Introduction

When a patient has inflammatory arthritis and a pre-existing spinal deformity, hip involvement further impairs posture and restricts mobility. Orthopaedic surgery, Despite the fact that Medical treatment has produced better results and may have reduced the need for surgery, procedures like total hip arthroplasty are often required to control pain and restore function and mobility.

Total Hip Arthroplasty (THA) is primarily indicated for advanced osteoarthritis, avascular necrosis of the femoral head, rheumatoid arthritis, post-traumatic arthritis, and sequelae of childhood hip disorders such as developmental dysplasia of the hip (DDH) and Perthes disease.[1] The procedure has consistently demonstrated excellent outcomes, with survival rates of implants exceeding 90–95% at 10–15 years, along with significant improvements in Harris Hip Score (HHS) and patient-reported quality of life.[2]

Globally, more than 1 million THAs are performed annually, with projections suggesting a two- to three-fold increase by 2030 due to an aging population, rising prevalence of osteoarthritis, and improved access to orthopedic care.[3] In Western countries, osteoarthritis is the predominant indication for THA, whereas in Asian countries including India, avascular necrosis (AVN) of the femoral head contributes to a substantial proportion of cases, often in younger patients.[4] Indian data suggest that 30–40% of hip arthroplasties are performed for AVN, reflecting lifestyle, genetic, and socioeconomic factors.[5]

Orthopaedic surgeons and doctors have always faced difficulties when performing orthopaedic surgery on patients who have inflammatory arthritis. Clinical signs of hip joint involvement include discomfort, restricted range of motion, and fast cartilage degradation that may also affect other lower extremities.[6] Inflammatory arthritis affects between 0.05% and 1% of the general population, and many patients require surgery, such as total hip replacement, due to articular degeneration.[7]

The management of inflammatory arthritis has improved over the past few decades thanks to the development of conventional synthetic disease-modifying anti-rheumatic medications

Address for correspondence: Dr. Umesh Samria, Assistant Professor, Department of Orthopaedics, JLN Medical College, Ajmer, Rajasthan, India.
E-mail: umesh.samria@gmail.com

DOI:
10.21276/amit.2025.v12.i3.280

How to cite this article: Shekhawat SS, Khinchi P, Samria U. A Hospital-Based Prospective Study to Assess the Functional Outcome of Total Hip Arthroplasty in Patients with Inflammatory Arthropathy Using the Harris Hip Score at a Tertiary Care Centre. Acta Med Int. 2025;12(3):1324-1327.

(csDMARDs) like methotrexate and the recognition of the significance of early diagnosis, timely treatment, and the Treat-to-Target approach. The prognosis for patients with rheumatoid arthritis has significantly changed since biological DMARDs (bDMARDs) and, more recently, targeted synthetic DMARDs (tsDMARDs) like tofacitinib were developed and introduced into clinical practice. Although the need for THA has decreased due to contemporary treatments for inflammatory arthritis, this technique is still commonly carried out and a multidisciplinary strategy is needed to lower the possibility of unfavorable outcomes. Due to concerns about infections, flare-ups of the disease, and unfavorable surgical results, surgeons frequently question the necessity of surgery for patients with inflammatory arthritis.[7]

Crystal-induced, immune-related, and reactive arthritis are all considered forms of inflammatory arthritis.[8] Systemic lupus erythematosus, rheumatoid arthritis, polymyositis, dermatomyositis, Sjogren syndrome, and systemic sclerosis are all considered immune-related forms of arthritis.[8] It is impossible to retrieve microorganisms from the joint after an infection elsewhere in the body is prevented by reactive arthritis.[8,9] A collection of conditions known as spodyloarthritis are distinguished by enthesitis and axial skeleton involvement.

Approximately 70% of these patients may be diagnosed upon presentation, with rheumatoid arthritis being the most common.[8-10] Understanding the necessity of THA and its advantages for patients with inflammatory arthropathies depends on the treatment's satisfactory functional outcome. The study's goals are to measure the post-operative complications in patients with inflammatory arthritis and to evaluate the functional result of total hip arthroplasty (THA) using the Harris hip score (HHS).

Materials and Methods

Twenty patients with confirmed inflammatory hip arthritis, ages 18 to 80, receiving THA at the JLN Medical College Department of Orthopaedics, participated in a prospective study. Ajmer, Rajasthan, India during a one-year period.

Inclusion criteria:

1. Patients receiving total hip replacement who have been diagnosed with inflammatory arthropathies.
2. Patients of both sexes who are older than 18 but younger than 80.

Exclusion criteria:

1. Individuals who are contraindicated for complete hip replacement and have a major current infection.
2. Individuals suffering from serious ailments.
3. Individuals suffering from serious mental illness.

Patients were admitted and underwent clinical and radiological examinations in accordance with protocol. The treatment was administered by the hospital's skilled joint replacement surgeons. Prior to surgery and at six, twelve, and twenty-four weeks, the patients were assessed clinically and radiologically. For six months, each case was barely monitored. Harris hip scores, which range from 70 to 100 and have the following interpretations, are used to evaluate functional outcome. Poor is defined as less than 70, fair as 70–79, good as 80–89, and outstanding as 90–100.

Radiological Assessment: A thorough examination of the hip was conducted using two distinct radiographic perspectives: the anteroposterior and frog-leg lateral views, on every patient. Inflammatory arthritis, including rheumatoid arthritis, seronegative spondyloarthritis, and juvenile idiopathic arthritis, exhibits progressive, symmetrical deformities, unlike osteoarthritis, which is characterized by asymmetric joint deterioration. The narrowing of joint spaces is uniform and concentric, typically occurring superolaterally in early rheumatoid arthritis; osteoarthritis is usually asymmetric.

The X-ray was scrutinized for:

- Acetabulum size;
- Acetabulum bone stock;
- Acetabulum structural integrity—protrusion;
- Acetabulum bone grafting requirement;
- Femoral canal size

Templates were prepared for the femoral and acetabular components. The correct size of the acetabular cup and the angle of anteversion were identified. Selecting the correct stem size, offset, and neck length for the implant on the femoral side involves using a template.

Surgical Technique: A curvilinear incision was created over the greater trochanter and extending in our study using a posterior approach. Splitting the gluteus maximus revealed the hip joint, and by flexing the knee and turning it externally, they marked and isolated the short external rotators from their insertion while maintaining tension. These external rotators protected the sciatic nerve. They used cautery and ligatures to establish hemostasis. Flexion, adduction, and mild internal hip rotation were used to dislocate the hip posteriorly after the capsule was removed.

The femoral head was removed after a femoral neck osteotomy was performed due to dislocation. After removing the soft tissues that were linked to the acetabulum, serial reaming was carried out up to the bleeding subchondral bone. After removing the osteophytes, the incision was irrigated to get rid of any remaining material. The reamer utilized was one size smaller than the acetabular cup diameters. The acetabular cup was secured with screws at the postero-superior quadrant, where the center of the offset positioned either superiorly or postero-superiorly. To shield it from any debris, gauze was placed over the acetabular cup.

The limb rotated inside, exposing and delivering the femur. In order to maintain anteversion and achieve the desired stem size, the femoral canal was manually reamed. In order to prevent proximal femur fracture, the stability of the femoral stem was investigated under rotational and extraction stresses.

The appropriate-sized prosthetic head was positioned on the Trunnion and secured with a mallet over a head impacter with a plastic cap. Any leftover debris was removed and a wash was performed. The stability of the decreased femoral head was verified by a functional range of motion wound that was sealed over a suction drain.

Postoperative Protocol: The hip was positioned at about 15 degrees of abduction during recovery from anesthesia, using a triangular pillow to maintain abduction and prevent excessive flexion. On the first post-operative day, X-rays are scheduled for examination. On the second post-operative day, the dressing was

replaced with a smaller one. A gait program began with the use of a walker that allowed weight-bearing until the patient reached tolerance. Following surgery, drains were typically removed 24 to 48 hours later. Subsequently, intravenous antibiotics were administered for 48 hours, followed by oral antibiotics for an additional seven days. Anticoagulant therapy, specifically low molecular weight heparin or heparin, was administered for the initial five days post-surgery. On the 12th postoperative day, sutures are removed, and the patient is discharged from the hospital to be reviewed one month later. They were cautioned against squatting, sitting cross-legged, using floor-level toilets, and crossing the lower limb over the midline. The patients were monitored at 6-week, 3-month, and 6-month intervals.

Statistical Analysis: Statistical analysis was performed by using SPSS 22.0v (Statistical package for social sciences) for comparing the incidences of adverse events and other complications. Data were analyzed using appropriate parametric statistical tests. A p-value <0.05 was considered statistically significant.

Results

Our study showed that mean age of patients was 42.56±11.58 years, The ratio of men to women was 2.33:1. In this study, 25% of patients had bilateral hip involvement, 30% had right side involvement, and 45% had left side involvement [Table 1].

Forty-five percent of the patients had rheumatoid arthritis, thirty-five percent had ankylosing spondylitis, and twenty percent had seronegative arthritis [Table 1].

15% of patients had outstanding results from their arthroplasty, 25% had medium results, 55% had good results, and 5% had poor results [Table 2].

Harris hip scores before surgery varied by an average of 7.458 at 6 weeks, 10.89 at 12 weeks, and 13.96 at 24 weeks. The Harris hip score varied statistically significantly during the follow-up period [Table 3].

Table 1: Demographic profile of patients

Demographic profile		Frequency (N=20)	Percent
Age (yrs) Mean±SD		42.56±11.58	
Sex	Male	14	70%
	Female	6	30%
Side	Left	9	45%
	Right	6	30%
	Bilateral	5	25%
Diagnosis	Rheumatoid Arthritis	9	45%
	Ankylosing Spondylitis	7	35%
	Sero Negative Arthritis	4	20%

Table 2: Distribution of the study group according to final outcome

Final outcome (HHS)	Frequency	Percent
Excellent	3	15%
Good	11	55%
Fair	5	25%
Poor	1	5%
Total	20	100

Table 3: Distribution of the study group according to comparison of Harris Hip score

Harris Hip score	Mean difference	Standard deviation	T value	P value
Preop Vs 6 Weeks	7.458	3.403	11.88	<0.0001*
Preop Vs 12weeks	10.89	7.066	8.365	<0.0001*
Preop Vs 24 Weeks	13.96	3.325	22.38	<0.0001*

Discussion

15% of patients had outstanding results from their arthroplasty, 25% had medium results, 55% had good results, and 5% had poor results [Table 2].

Harris hip scores before surgery varied by an average of 7.458 at 6 weeks, 10.89 at 12 weeks, and 13.96 at 24 weeks. The Harris hip score varied statistically significantly during the follow-up period [Table 3].

The primary causes of the technical difficulties in conducting THR on these patients are osteopenia, protrusio acetabuli, and bone loss. Due to the possibility of subsequent osteoporosis, Hip resurfacing is not appropriate for these patients. The usage of cemented versus uncemented THR has not been well-supported until recently.[11]

Total joint replacement indications are changing. The 1970s saw the introduction and widespread use of total hip replacements (THR), which were first used as last-resort treatments for patients whose daily living activities were significantly interfered with. Twelve Nonetheless, within the past 20 years, the likelihood of difficulties and early modifications has decreased. Furthermore, research has shown that individuals who have surgery later in their functional decline have lower functional outcomes than those who undergo surgery earlier. As a result, the indications are growing, and patients are now usually offered the option of complete joint replacement earlier in the arthritis's development and the functional deterioration that goes along with it.[12]

According to Sanjeev Prakash et al. (2013), the average age at which ankylosing spondylitis first appeared was 21.2 years old. According to Joshi et al. (2014), the average age of involvement

was 47 years old (17–77 years), which was in line with our findings.

According to the sex distribution, 70% of the population was male and 30% was female. A study by Leela C. Biant revealed that women had a greater incidence of RA.[13-15]

After THA, patients with rheumatoid arthritis, SLE, and ankylosing spondylitis experienced considerably higher inpatient medical and orthopedic problems ($p<0.01$) than patients with OA, according to a research by Schnaser et al.[16] The highest risk of orthopedic complications (2.8%) was found in patients with juvenile idiopathic arthritis (JIA). Wound dehiscence for rheumatoid arthritis, ankylosing spondylitis, peri-prosthetic fractures for JIA, and elevated mortality for individuals with systemic lupus erythematosus were among the specific orthopedic consequences by subtype. Patients with psoriatic arthritis did not differ significantly in terms of orthopedic or medical problems.[17]

Conclusion

This study had shown in Short-term follow-up showed that most patients had favorable THA outcomes and that most of them experienced an improvement in their HHSs. This study demonstrates that uncemented total hip arthroplasty is an effective primary surgical option with hip arthritis with restricted activity due to inflammatory causes.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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