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To study the clinical outcome of total hip arthroplasty

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Abstract

Aim: The purpose of this research was to evaluate the clinical efficacy of total hip arthroplasty at our institution.

Material and Methods: A prospective and retrospective analysis of one hundred patients who underwent total hip replacement was conducted. Prior to the operation, all patients underwent a standard clinical and laboratory evaluation that included routine investigations and concise information regarding their age, sex, address, and clinical history. Clinical evaluation was used to document preoperative range of motion, deformities, and their values for the study. The Modified Harris hip scoring was performed both preoperatively and postoperatively, with follow-up conducted at four-week, six-month, one-year, and annual intervals.

Results: The subjects of this research comprised individuals aged between 21 and 70 years, with an average age of 45.5 ± 1.15 years at the time of the procedure. AVN constituted the primary indication for surgical intervention in 72 patients (72%). The average Harris hip score prior to surgery was 35.77. The overall mean score following the procedure was 70.44. Twenty-four percent of patients experienced stress shielding as a complication.

Conclusion: Clinical and functional outcomes are favorable with or without cement in total hip arthroplasty, and this is predicated by a number of variables, including the indication for the procedure, the implantation of the prosthesis, and the operative technique. It is necessary to assess the outcomes of the procedure through long-term studies.

Keywords: Long-term, studies, functional

Introduction

In order to ascertain the durability of operative procedures such as total hip replacement (THR), it is critical to evaluate their long-term outcomes [1]. Surgical intervention known as total hip arthroplasty has provided relief to millions of individuals afflicted with incapacitating hip joint discomfort [2-3]. Phillip Wiles is believed to have performed the initial complete hip replacement in London in 1938 [4]. Subsequent to its initial development by McKee and Farrar in the 1950s, Sir John Charnley further refined the procedure in the late 1960s [5-6].

Total hip arthroplasty (THA) is currently one of the most frequently performed surgical procedures in orthopaedics, and it provides excellent pain relief and functional outcomes. Hip osteoarthritis of the primary cause necessitates a total hip replacement (THA), with an average age of 69 years at the time of surgery. The most frequently encountered pediatric hip disorders that can result in tibia flexion arthritis (THA) are as follows [7-9]. Perthes disease, posttraumatic arthritis, juvenile inflammatory arthritis (JIA), avascular necrosis (AVN) of the femoral head caused by slipped capital femoral epiphysis (SCFE), developmental dysplasia of the hip, and septic arthritis [10, 11].

Prompt diagnosis and appropriate treatment, including surgical decompression and appropriate antibiotic usage, are critical in determining the prognosis. Septic arthritis of the hip, if left untreated, has the potential to induce anatomical deformation in multiple soft tissue and bone structures, thereby giving rise to secondary arthritis-related discomfort.

Uncemented total hip arthroplasty is characterized by an exceptionally long-lasting prosthesis with a 15-year revision rate. In contrast, patients undergoing cemented hip arthroplasty experience a greater prevalence of transient low-grade thigh discomfort. While initial results may seem less favorable in comparison to cemented hip arthroplasty, the long-term outcomes of the two procedures are comparable when spanning 5 to 20 years [12].

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Total hip replacement (THR) improves the quality of life of patients with moderate to severe arthritis of the hip by alleviating their pain and functional impairment. In these patients, total hip arthroplasty (THA) is the preferred treatment option for pain reduction and enhancement of quality of life. To mitigate the likelihood of reinfection, it has been suggested that a quiescent period of over ten years be observed^[12]. It is an exceptionally economical procedure. In order to ascertain the durability of procedures such as total hip replacement (THR), outcome evaluation is crucial. The Harris hip score is the scoring system that is most frequently applied when assessing hip arthroplasty^[2]. This study is undertaken to assess the Clinical outcome of the Total hip Arthroplasty.

Materials and Methods

This prospective and retrospective investigation was conducted on one hundred patients who underwent total hip replacement surgery at the orthopedics department. For retrospective cases, patient information was compiled from clinical databases, case files, and operation theater records; for prospective cases, questionnaires and case files were utilized. Patients were evaluated at four-week, six-month, and one-year follow-up intervals.

Inclusion criteria

All individuals aged 18 years and older who had undergone Total Hip Arthroplasty as a treatment for solitary hip pathologies.

Exclusion criteria

Individuals who had undergone Total Hip Replacement and presented with deformities or pathologies affecting other lower limb joints, potentially compromising the surgical outcome in terms of functionality.

Methods

- A complete history and thorough clinical examination were performed.
- The range of motion and deformity were assessed using a goniometer.
- Prior to and following surgery, the Modified Harris Hip Score was utilized to evaluate every patient.
- Every patient underwent surgery utilizing the conventional posterolateral approach.
- Prophylactic antibiotics were administered to all patients 24 hours preoperatively and for a maximum of 72 hours postoperatively, unless contraindicated. The regimen consisted of oral antibiotics for a duration of 7 days.
- For the initial five days following surgery, low molecular weight heparin was administered as DVT prophylaxis.
- After surgery, drains were withdrawn 24 to 48 hours later.
- On the initial postoperative day, X-rays are obtained for evaluation.
- Static quadriceps exercises are instructed to the patient, and knee and ankle mobilization are performed while the patient sits.
- On the second postoperative day, the dressing is replaced to a smaller one. Weight-bearing was initiated with a walker adjusted to tolerance for gait training.
- Between the tenth and twelfth day following surgery,

sutures are extracted and the discharged from the hospital.

- Postoperative Harris hip scoring was performed at the moment of discharge, after four weeks, six months, and one year.

Statistical analysis

The Excel and SPSS software programs were employed to input and analyze the data, respectively. For continuous data, the results were averaged (Mean + standard deviation) for each parameter; for categorical data, the values and percentages are displayed in the table and figure. The paired t-test and the chi-square test of significance were employed to compare the proportions. For each of the aforementioned tests, a "p" value below 0.01 was deemed to signify statistical significance.

Results

The study was carried out on 100 hips of 100 patients who underwent uncemented Total Hip Replacement. This study was conducted on patients with age ranging from 21 to 70 years with a mean age of 45.5 ± 11.15 years at the time of surgery, 80 (80%) Were males and 20 (20%) were females. All the patients underwent unilateral total hip replacement.

Table 1: Distribution of patients according to age

Age distribution	Mean
21-70	45.5 ± 11.15

The subjects of this research comprised individuals aged between 21 and 70 years, with an average age of 45.50 ± 11.15 years at the moment of undergoing the procedure.

Table 2: Distribution of patients according to gender and side involving hip replacement

Gender distribution	%
Male	80 (80%)
Females	20 (20%)
Side distribution	
Right side	72 (72%)
Left side	28 (28%)

Twenty (20%) were females and eighty (80%) were males. Total hip replacement was performed unilaterally on every patient. There were a total of 28 hip replacements performed on the left side and 72 on the right.

Table 3: Showing underlying pathology indicative of Total Hip Arthroplasty in the study

Diagnosis		Frequency	Percentage (%)
Avascular Necrosis (AVN)	Idiopathic AVN	22	22%
	Post Traumatic AVN	4	4%
	Steroid Induced	14	14%
	Avn due to Chronic Alcoholism	32	32%
Osteoarthritis		10	10%
Ankylosing Spondylitis		4	4%
Rheumatoid Arthritis		4	4%
Sickle Cell Disease		10	10%
Total		100	100%

The main indication for surgery was avascular necrosis in 72 patients (72%).

Table 4: Paired student t test between Pre-operative and post-operative scores according to the various parameters of the Modified Harris Score System.

Parameters of modified HHS		Frequency	Range	SD	Mean	P value
Pain	Preoperative	30	25	±3.442	17.22	0.00
	Postoperative	30	15	±4.223	34.66	
Function (gait)	Preoperative	30	26	±6.443	21.45	0.00
	Postoperative	30	14	±3.221	28.11	
Function (Activity)	Preoperative	30	11	±2.112	5.34	0.00
	Postoperative	30	3	±0.855	10.5	
Absence of deformity	Preoperative	30	3	±0.433	3.45	0.00
	Postoperative	30	0	±0.000	4.11	
ROM score	Preoperative	30	3	±0.564	2.56	0.00
	Postoperative	30	1	±0.432	4.80	
Total score	Preoperative	30	32	±14.234	35.77	0.00
	Postoperative	30	22	±7.434	70.44	

The Modified Harris Hip Score was employed to assess the functional outcome. In terms of both the overall score and individual parameters, a lower disability is indicated by a higher score. Total pre-operative score was 35.77 on average. The overall mean score following the procedure was 70.44. In relation to the various components comprising the scoring system-namely, pain, locomotion, functional activity, absence of deformity, and range of motion-the postoperative score exhibited a statistically significant enhancement (P value <0.001) in comparison to the pre-operative score.

Table 5: Outcome score grade

Outcome Score Grade	Pre-operative	Post-operative
Poor	94(94%)	2(2%)
Fair	6(6%)	20(20%)
Good	0	42(42%)
Excellent	0	36(36%)
Total	100	100

Preoperatively 94% had a poor score. The results showed a significant improvement, wherein 36% had an excellent score and 42% showed good and 20% fair results. 2% patient had a poor score.

Discussions

Total hip Arthroplasty is a surgical procedure that has been extensively documented. It improves the quality of life of patients with moderate to severe arthritis of the hip by alleviating pain and functional impairment. Our research revealed that 20% of the patients were aged 50 years or older, with a mean age of 45.5±11.15 years and a range of 21 to 70 years. Our study's mean age was similar to that of the research conducted by Unger AS *et al.* [13] However, our study did not find any statistically significant correlation between the age of the patients and their functional outcome.

The study found that the most prevalent indication for replacement was avascular necrosis (AVN). Chronic alcoholism accounted for 32% of AVN cases, followed by idiopathic AVN (22%) and steroid-induced AVN (14%), and post-traumatic AVN (4%). The functional outcome in our study was evaluated using the Harris hip score, the most extensively used scoring system for hip arthroplasty. Comparable results were obtained by 78% of patients in terms of pain relief and function, which is similar to the findings of RC Siwach *et al.* [1] (75% of patients achieved excellent or good outcomes) and Chandrasekhar *et al.* [14] (84% of patients achieved outstanding results). The average pre-operative Harris Hip score was 35.77, whereas the mean score increased to 70.44 after the procedure. A statistically significant

improvement was observed in the Harris hip score postoperatively.

An additional determinant that potentially impacts the outcome of arthroplasty is the indication for total hip arthroplasty. In our analysis, every patient diagnosed with osteoarthritis achieved a favorable prognosis, while 80% of patients with sickle cell disease and all patients with rheumatoid arthritis had a moderate prognosis. Outcome scores for patients diagnosed with ankylosing spondylitis were unsatisfactory in 50% of cases. The findings of this research correlate with those of Ganeshan *et al.* [15], who similarly concluded that the functional prognosis of total hip arthroplasty is superior in patients with osteoarthritis than in those with rheumatoid arthritis. We discovered a statistically significant relationship between the indication for surgery and the ultimate outcome in our research.

This study observed stress shielding in 24% of the total cases, which is similar to the finding of Engh C *et al.* [16], who observed stress shielding in 12% of the cases. The association between stress shielding and rheumatoid arthritis, sickle cell disease, and ankylosing spondylitis was determined to be statistically significant in all cases.

Comparable to the results of Ganeshan *et al.* [15], which reported a 1-1.5 cm shortening in 13% of cases, more than 12% of the cases in our study exhibited more than 1-1.5 cm of shortening, which was corrected with footwear correction in the form of shoe elevate. Infection (4%), dislocation (2%), periprosthetic fracture (2%), and heterotrophic ossification (2%), among others, constituted additional complications in our study. This finding was similar to that of Anne Lubbeke *et al.* [17], who documented prosthetic joint infection at a rate of 0.7%, periprosthetic fracture at 3.4%, and dislocation at 3.2%.

A superficial post-operative infection was observed in 4% of the cases. Succeedingly managing these cases required prolonged administration of sufficient antibiotic coverage and postponement of suture removal. This finding was similar to that of Siavashi *et al.* [18], who documented an infection in three cases.

The current study has certain inherent limitations, including the use of single-center data without a control group. The author acknowledges that a similarly significant limitation was the tiny sample size.

Conclusion

In summary, the clinical and functional outcomes of total hip arthroplasty, whether performed with or without cement, are favorable and are contingent upon various factors, including the indication for the procedure, the technique employed during surgery, and the implantation of the prosthesis. It is

necessary to assess the outcomes of the procedure through long-term studies.

Conflict of Interest

Not available

Financial Support

Not available

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