



## FUNCTIONAL OUTCOME OF BILATERAL CEMENTLESS TOTAL HIP ARTHROPLASTY IN DEGENERATIVE ARTHRITIS

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**ABSTRACT** **Introduction :** Bilateral hip degenerative arthritis is a frequent finding in 42% population with osteoarthritis. Unbearable pain restrict daily activities of living to a great extent. Bilateral total hip arthroplasty is an well established reconstructive procedure for advanced arthritis. The objective of this study was to evaluate functional outcome of bilateral cementless total hip arthroplasty using Harris Hip Score. **Materials And Methods :** A prospective study conducted in 20 patients with 40 hips were analyzed for clinical and functional outcome. Age, sex , operative indication and preoperative Harris Hip Score were documented. Operative time and complications were noted. Patients were evaluated immediate post operative period ,3 month and at 6 months . Harris Hip Score , Visual Analogue score , range of movement evaluation was done and documented. **Results :** Mean preoperative Harris hip score was 38.6 on left side and 39.3 on right side . This score improved to 88.04 on left and 86.03 on right side immediate post operative period and 94 on left and 93 on right side on 6 month followup. A significant improvement in Visual analogue score (VAS ) and range of movements were observed in post operative follow up. The outcome after bilateral total hip replacement was excellent in 95% and good in 5% of cases. **Conclusion :** Current generation of prosthesis used in cement less bilateral total hip arthroplasty for degenerative arthritis of hip, provides satisfactory functional and radiological outcomes . It is an effective and safe procedure and improves the quality of life by relieving pain and improving functional disability.

**KEYWORDS :** Degenerative arthritis , Bilateral cement less total hip arthroplasty , Harris Hip Score

### INTRODUCTION

Osteoarthritis is a progressive and chronic articular disease of joints characterized by pain. More than 10% of people older than 60 years of age are affected by osteoarthritis of the hip<sup>1</sup>. Bilateral hip disease is a frequent finding that can occur in up to 42% of the population with osteoarthritis and it is estimated that 25% of patients with osteoarthritis requiring total hip replacement will need a bilateral replacement<sup>2</sup>. Unbearable pain due to end stage arthritis of the hip greatly restrict activities of daily living. Total hip replacement is an established procedure for advanced hip joint arthritis. It significantly improves the quality of life by relieving pain and improving functional disability<sup>3</sup>. Total hip arthroplasty, has improved the management of those diseases of the hip joint that have responded poorly to conventional medical therapy<sup>4</sup>. 10% of patients require contralateral total hip arthroplasty (THA) within 1 year of their first THA procedure<sup>5</sup>. In addition, optimal functional outcomes are obtained only after bilateral THA<sup>6</sup>. To assess hip functions both preoperatively and post surgically, a number of functional assessment tools are developed. Harris Hip Scoring (HHS) system is one of these tools<sup>7</sup>. In this study we aim to know postoperative improvement in patients who had undergone total hip arthroplasty, in terms of functional outcome and pain relief using Harris hip score at 3 months and 6 months postoperatively.

### MATERIAL AND METHODS

This is a prospective study conducted in the Department of Orthopedics, Jorhat Medical College and Hospital during 12 months period from January 2021 to January 2022 after obtaining institutional ethical clearance. Inclusion criteria included patients of age 18 years and above with chronic symptoms of degenerative arthritis of hip and no response to conservative treatment with analgesics, and physiotherapy for 6 months and affecting their activities of daily living. Exclusion criteria included patients below the age of 18 years, who are unfit for surgery due to co morbid medical conditions and presence of active infective foci. A total of 20 patients with 40 hips, who had given an informed and written consent for bilateral total hip

replacement surgery were included in to the study after explaining them the operative procedure, its complications and purpose of the study. All the participants of the study were admitted in the orthopedic ward. Patients were examined both clinically and radiologically, and functional outcome was assessed by modified Harris hip score preoperatively and postoperatively. Total Harris hip score is 100 points. Score 90-100 is excellent, score 80-89 is good, scores 70-79 termed fair and score below 70 termed as poor functional outcome. All patients were operated by 2 stage bilateral cement less Total Hip Arthroplasty under combined spinal epidural anaesthesia. Posterior Moore's approach was used. Acetabular cup and femoral stem were placed .Contralateral hip was operated after a period of 2 week. Post op x-rays were done immediately after surgery and at the end of 3, 6 months after the surgery .Limbs were kept in abduction with pillow in between during immediate post operative period . Patient's were mobilized on post operative day 2 . Patients were advised to avoid squatting, cross legged sitting. They were taught static quadriceps strengthening exercises and abduction exercises. Intravenous antibiotics were used for 7 days and changed to oral antibiotics to be used for next 7 days. All the participants were again assessed through Harris hip score at 3 months and 6 months postoperatively. All the data obtained were recorded and analyzed by SPSS software.

### RESULTS

40 hips were operated upon 20 patients for degenerative arthritis of hip. Mean age was 36 years . 14 (70%) were males and 6 (30%) were females. The main indication for surgery was primary osteoarthritis in 14 cases (70%), 3 cases (15%) of secondary osteoarthritis following steroid use, 1 case of ankylosing hip, 1 case of late presentation of bilateral developmental dysplasia of hip (DDH) and 1 case of fibrous dysplasia. Mean follow-up was 9 months , mean hospital stay length was 17.3 days and mean operative time was 118 minutes. Mean hemoglobin levels were 14.8 g/dL preoperatively and 10.6 g/dL postoperatively. Mean preoperative Harris hip score was 38.6 on left side and 39.3 on right side , ranging from 31 to 52. This score improved

to 88.04 on left and 86.03 on right side immediate post operative and 94 on left and 93 on right side on 6 months followup. A significant improvement in VAS score and range of movements were observed in post operative follow up. The results showed a significant improvement with 19 patients having an excellent score and 1 patient having good score. The outcome after total hip replacement was excellent in 95% and good in 5% of cases.

**Table 1 : Modified Harris Hip Score results Left side**

Mean ± SD	PREOP HHS	POSTOP HHS ( 6 Months )	P VALUE
PAIN	11.8 ± 3.9	44.02 ± 1.28	<0.05
FUNCTION	24.75 ± 4.9	41.24 ± 1.59	<0.05
ABSENCE OF DEFORMITY	0.31 ± 1.1	4.1	<0.05
ROM SCORE	2.09 ± 0.9	4.73 ± 0.31	<0.05
TOTAL SCORE	38.6 ± 04.65	94.2 ± 03.22	<0.05

**Table 2 : Modified Harris Hip Score results Right side**

Mean ± SD	PREOP HHS	POSTOP HHS ( 6 Months )	P VALUE
PAIN	12.3 ± 3.4	44.02 ± 1.28	<0.05
FUNCTION	24.23 ± 5.1	41.24 ± 1.59	<0.05
ABSENCE OF DEFORMITY	0.29 ± 0.9	3.9	<0.05
ROM SCORE	2.12 ± 1.1	4.41 ± 0.32	<0.05
TOTAL SCORE	39.3 ± 04.65	93.4 ± 03.22	<0.05

**Table 3 : Pre and Post operative VAS and Range of movements.**

	LEFT HIP PREOP	LEFT HIP POSTOP (6 months)	RIGHT HIP PREOP	RIGHT HIP POST OP (6 Months)
VAS	6.4 ± 3.9	1.6 ± 1.9	7.1 ± 4.1	1.7 ± 2.1
FLEXION	51.9 ± 13.3	114 ± 21	55.3 ± 12.7	113.7 ± 20.1
EXTENSION	6.4 ± 2	9.6 ± 1.9	6.7 ± 1.9	9.1 ± 1.5
ABDUCTION	11.9 ± 5.2	38.2 ± 11	11.5 ± 5.9	37.9 ± 11.6
ADDUCTION	11.4 ± 7.5	29.8 ± 7.9	11.7 ± 8.1	28.9 ± 7.7
EXTERNAL ROTATION	15.4 ± 6	39.1 ± 9	15.7 ± 5.1	38.6 ± 7.9
INTERNAL ROTATION	12.5 ± 3.8	25.4 ± 7.2	13.1 ± 4.1	24.8 ± 8



**Figure 1: Preoperative Xray (case 1)**



**Figure 2: Post Operative Xray (case 1)**



**Figure 3: Head extraction**



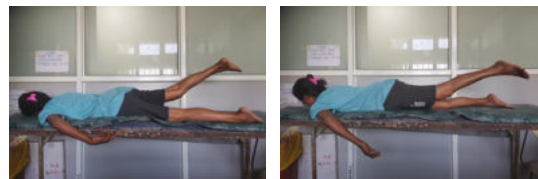
**Figure 4: Osteophytes**



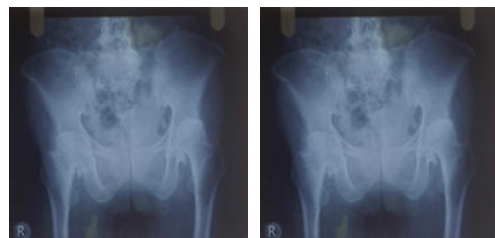
**Figure 5 : Hip Flexion at 6 months**



**Figure 6 : Hip Abduction at 6 months**



**Figure 7 : Hip Extension at 6 months**



**Figure 8: Preoperative xray( case 2). Figure 9 : Postoperative Xray (case 2)**

In our study 90 % (18 ) of the cases had no complications. 1 case (5%) had complications of limb length discrepancy , 1 case (5%) had

superficial infection which resolved 2 weeks postoperatively after injectable antibiotics.

## DISCUSSION

This study was carried out on 40 hips in 20 patients who underwent bilateral total hip replacements. In our study, patients age group ranged from 18 to 68 years, out of which 5 (25 %) were below 30 years, 5 (25%) between 30-39 years, 8(40%) were between 40-60 years. 2 (10%) were more than 60 years. The mean age was 36.22 years. The Framingham Osteoarthritis (OA) Study has established that the frequency of radiographically evident OA, i.e., joint space narrowing, increases with each decade, beginning at 12.9% in people of 30-40 years of age and increasing to 43.7% in people over the age of 80<sup>8</sup>. 14 (70%) were males and 6 (30%) were females. The main indication for surgery was primary OA in 14 cases (70%), 3 cases (15%) of secondary osteoarthritis following steroid use, 1 case of ankylosing hip, 1 case of late presentation of bilateral developmental dysplasia of hip (DDH) and 1 case of fibrous dysplasia. Aaron et al in their study found pain as the principal indication for hip replacement and is reliably relieved as early as one week after surgery<sup>9</sup>. Constant pain with or without substantial radiological changes and functional impairment are the agreed criteria for joint replacement<sup>10</sup>.

All surgeries were performed through posterior approach. Moretti et al in their study concluded that each approach has its own unique advantages and disadvantages, but all can be safely and successfully utilized for THA<sup>11</sup>. Tapered plasma coated stem was used in all patients. Most commonly used stem size was 4. The metallic head size ranged from 28 - 36 and most commonly used was 32(70%).The maximum acetabular shell size used was 56 and minimum was 48. Shell size 54 was the most commonly used (60 %). UHMWPE liner was used corresponding to the size of the head used. Size 32 was most frequently used. Mean follow-up was 9 months , mean hospital stay length was 17.3 days and mean operative time was 118 minutes. Mean hemoglobin levels were 14.8 g/dL preoperatively and 10.6g/dL postoperatively.

All patients were evaluated by the Modified Harris hip score. Modified Harris Score is a valid and reliable tool for assessment of functional outcome in post operative patients of bilateral total hip replacement in Indian patient<sup>12</sup>. Mean preoperative Harris hip score was 38.6 on left side and 39.3 on right side , ranging from 31 to 52. This score improved to 88.04 on left and 86.03 on right side immediate post operative and 94 on left and 93 on right side on 6 months followup and are comparable with studies of Kim<sup>13</sup> et al. study (from 55.3 to 91), McLaughlin<sup>14</sup> et al. (from 48 to 93). A statistically significant improvement in VAS score and range of movements were observed post operative follow up. Nies<sup>15</sup> et al in their study observed that there was a high correlation between the Harris hip scores and the VAS scores (+0.84). 90 % (18 ) of the cases had no complications. 1 case (5%) had complications of limb length discrepancy , 1 case (5%) had superficial infection which resolved 2 weeks postoperatively after injectable antibiotic. Ranawat et al in their study found a postoperative limb length inequality ranged from -7 mm to +8 mm<sup>16</sup>. Results are comparable to study conducted Marahatta SB et al where 2 % of patient were having superficial skin infection postoperatively<sup>17</sup>.

## CONCLUSION

Two stage cementless bilateral total hip replacement relieves pain and improves functional outcome in patients of degenerative arthritis of hip. The outcome of bilateral total hip replacement is determined by factors including preoperative harris hip scores, range of movements and component design . Our study suggests that the current generation of prosthesis used in bilateral cementless total hip replacement for degenerative arthritis of hip, provides satisfactory functional and radiological outcomes . It is an effective and safe procedure which can be safely opted for end stage diseases of hip and have less complications.

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