



ISSN (P): 2521-3466  
ISSN (E): 2521-3474  
© Clinical Orthopaedics  
www.orthoresearchjournal.com  
2021; 5(1): 13-15  
Received: 08-11-2020  
Accepted: 12-12-2020

**Dr. Naveen BS**  
Senior Resident, Department of  
Orthopedics, MVJ Medical  
College and Research Hospital,  
Bangalore, Karnataka, India

**Dr. Hemanth R**  
Assistant Professor, Department  
of Orthopedics, MVJ Medical  
College and Research Hospital,  
Bangalore, Karnataka, India

## Clinical and functional outcome of primary uncemented total hip arthroplasty

**Dr. Naveen BS and Dr. Hemanth R**

**DOI:** <https://doi.org/10.33545/orthor.2021.v5.i1a.252>

### Abstract

Uncemented total hip arthroplasty based on these principles will effectively bring down the morbidity and the rate of infection. Further interface pain and osteolysis are still remains as the commonest modes of failure. An uncemented total hip arthroplasty with its capability of bone stock preservation is also useful in patients requiring revision surgery. A total of 22 patients were underwent primary uncemented total hip arthroplasty by posterior approach. All the patients were contacted for clinical and radiological assessment through postal and personal communication. All 22 patients attended the review arthritis clinic on a previously provided appointment date. The mean Harris hip score improved from a preoperative mean of 37.43 (range, 28-59) to a postoperative mean of 91.33 (range, 75-99). At the latest follow up, the total mean score was 91.33, with 75 being the minimum and 99 being the maximum. The results showed a significant improvement, wherein, 25 hips (83.33%) had excellent results, 3 hips (10%) showed good results and 2 hips (6.67%) showed fair results. No poor outcome noted in the study.

**Keywords:** Total hip arthroplasty, harris hip score, uncemented total hip arthroplasty

### Introduction

Total hip arthroplasty is one of the true triumphs of modern medical science and remains one of the most effective and safe orthopaedic adult reconstructive procedures <sup>[1]</sup>. Total hip arthroplasty (THA) is a remarkably successful and predictable procedure that provides pain relief, functional improvement, and improved quality of life. Success of all arthroplasties depends on the skill of the surgeon, the surgeon's understanding of the basic biomechanics underlying the joint function, the design of the prosthesis, and the technical equipment used to insert the prosthesis <sup>[2, 3]</sup>.

Bone preservation, prosthesis incorporation, improved designs in bearing surfaces and costs have extended the indications and longevity of the total hip arthroplasties. Uncemented total hip arthroplasty based on these principles will effectively bring down the morbidity and the rate of infection <sup>[4]</sup>. Further interface pain and osteolysis are still remains as the commonest modes of failure. An uncemented total hip arthroplasty with its capability of bone stock preservation is also useful in patients requiring revision surgery. Uncemented prosthesis works on the principles of biological fixation and relies on bone ingrowth into a porous implant surface or bone on growth to a biologically active implant surface <sup>[5]</sup>. The two prerequisites for bone ingrowth are immediate mechanical stability at the time of surgery and intimate contact between the porous surface and viable host bone <sup>[6]</sup>.

### Methodology

A total of 22 patients were underwent primary uncemented total hip arthroplasty by posterior approach. All the patients were contacted for clinical and radiological assessment through postal and personal communication. All 22 patients attended the review arthritis clinic on a previously provided appointment date. The diagnosis, preoperative assessment, operation records and follow up radiographs of these patients were systematically reviewed from the available hospital data.

During this clinical assessment, patient's identity was verified and confirmed. The follow-up records of clinical assessment by assessment of pain and activity restriction were done with the questionnaire as per the study proforma and also modified Harris hip score was evaluated at

**Corresponding Author:**  
**Dr. Hemanth R**  
Assistant Professor, Department  
of Orthopedics, MVJ Medical  
College and Research Hospital,  
Bangalore, Karnataka, India

the same setting.

All the patients were operated by the same surgical team headed by the same senior arthroplasty surgeon. 8 patients underwent staged bilateral hip replacement surgery and 14 patients underwent unilateral surgery.

Radiological assessment was done with radiographs of anteroposterior and frog leg lateral views of pelvis with hip joints including entire proximal femur till the tip of the femoral prosthesis. These radiographs were assessed for component placement, inclination, coverage and migration on acetabular side were particularly noted, osteolysis was looked for according to the system of DeLee and Charnley. On the femoral side component placement, subsidence of prosthesis, migration, radiolucent lines and stress-shielding were classified according to the system of Gruen *et al.* on the femoral side. All radiographs were analyzed for zones of osteolysis as defined by Zicat *et al.* The stability of the femoral implant was classified according to the system of Engh *et al.* Heterotopic bone formation was graded according to the criteria of Brooker *et al.* Linear polyethylene wear was evaluated in two dimensions on anteroposterior radiographs with use of the method described by Charnley and Halley.

Definite loosening of the acetabular component was diagnosed when there was a change in position of the component (>2mm vertically and/or medially or laterally) or a continuous radiolucent line wider than 2mm on both the anteroposterior and lateral radiographs.

Osteolysis was defined if areas of endosteal, intracortical, or cancellous destruction of bone that were not linear, were greater than 2 mm in width, and had been progressive. Inclination of the cup was measured as the angle between the interteardrop line

and a line drawn from the cranial and caudal edge of the cup. If the interteardrop line was not clearly visible, then a line connecting the ischial tuberosities was used as the horizontal reference line.

## Results

**Table 1:** Modified Harris hip score

Modified HHS	Min-Max	Mean	SD
Pre-op	28.00-59.00	37.43	7.19
Post-op	75.00-99.00	91.33	5.26
difference	-53.90	-	-
t value	-40.662	-	-
P value	<0.001**	-	-

**Table 2:** Outcome according to Modified Harris hip score

Results	No Of Hips	%
Excellent	25	83.33%
Good	3	10%
Fair	2	6.67%
Poor	0	0%

The mean Harris hip score improved from a preoperative mean of 37.43 (range, 28-59) to a postoperative mean of 91.33 (range, 75-99). At the latest follow up, the total mean score was 91.33, with 75 being the minimum and 99 being the maximum. The results showed a significant improvement, wherein, 25 hips (83.33%) had excellent results, 3 hips (10%) showed good results and 2 hips (6.67%) showed fair results. No poor outcome noted in the study.

**Table 3:** Complications

Complications	No. of patients	Distribution
1. Thromboembolism	0	0%
2. Nerve injuries	2	9.09%
3. Superficial infection	1	4.54%
4. Deep infection	0	0%
5. Vascular injuries	0	0%
6. Heterotopic ossification	1	4.54%
7. Fractures	0	0%
8. Dislocation and subluxation	0	0%
9. Anterior thigh pain	3	13.63%
10. Loosening	1	4.54%
11. Osteolysis	0	0%

In our study, one patient (4.54%) developed superficial wound infection postoperatively which was treated with antibiotics and regular dressing. Wound healed subsequently without deep infection. Two patients (9.09%) postoperatively developed nerve injury in the form of foot drop which eventually recovered over a period of 6 -8months in both the patients. Three patients (13.63%) developed anterior thigh pain postoperatively. One patient (4.54%) was diagnosed with aseptic loosening of acetabular component. One patient (4.54%) had heterotopic ossification Brooker grade 2 without any limitation of movements. 14 patients (63.63%) did not have any complications.

## Discussion

The modified Harris hip score is the most widely used scoring system for evaluation of total hip arthroplasty. We have also used modified Harris hip scoring system to evaluate our results. Based on this pattern the analysis of our study shows excellent

results in 25 hips (83.33%), good results in 3 hips (10%) and fair results in 2 hips (6.67%). Our results are comparable with studies by Keijo T [7], Kjell S [8] and Kristoff Corten [9]. This finding suggests total hip arthroplasty in elderly population with low demanding activities yields predictable excellent to good results. The bearing pattern of metal (28mm femoral head) on highly cross linked polyethylene works excellently in elderly population.

BK Dhaon *et al.* [10] studied about 47 uncemented total hip arthroplasties in 34 patients, the mean Harris hip score improved from preoperative mean of 36.6 to 89 after average follow up of 5.7 years, giving excellent result with disabling disorder of hip treated with uncemented total hip arthroplasties. Our study showed improvement of preoperative mean of 37.43 to 91.33 with an average follow up of 42.3 months which was similar to above study.

Singling out the primary indication of the procedure is difficult, but studies by Harkness JW [11], Ji-Ho Lee *et al.* [12] document

arthritis group to be the most common indication. Arthritis was the most common indication for THA in our study as well; most of it was caused secondary to avascular necrosis of femoral head accounting for 59.09% of hips operated in our study. Other indications were being non-union fracture neck of femur, secondary arthritis due to developmental dysplasia of hip, perthes disease and ankylosing spondylitis. The change in life pattern, increase in chronic alcoholism, smoking and steroid abuse has dramatically increased the incidence of avascular necrosis of femoral head. The arthritis due to this cause is often gradual, causing painful disabilities in the earning population. Thus the demand for predictable and assured results of surgery like total hip arthroplasty in this population is becoming more and more popular. Also the availability of durable bearing surfaces has further extended the indications for the surgery.

### Conclusion

The mean preoperative Harris hip score was 37.43(range, 28-59) which improved to a postoperative mean Harris hip score of 91.33(range, 75-99).

### References

1. Daniel AU, Harkess JW. Introduction and Overview. In: Canale ST, Daughtery K, Jones L, editors. Campbell's Operative Orthopaedics, 10th ed. Philadelphia: Mosby 2003, 223-242.
2. Ducheyne P. Biological fixation of implants. In: Ducheyne P, Hastings GW, editors. Functional behaviour of orthopaedic materials. Boca Raton, FL: CRC Press 1984, 163-199.
3. Dunn MG, Maxian SH. Biomaterials used in orthopaedic surgery. In: Greco RS, editor. Implantation Biology: the host response and biomedical devices. Boca Raton, FL: CRC Press 1994, 229-252.
4. Bragdon CR, O'Connor DO, Muratoglu OK *et al.* A new polyethylene with undetectable wear at 12 million cycles. In: 24th Annual Meeting of the Society of Biomaterials. San Diego, CA 1998, 2.
5. Uchida A, Nade SM, McCartney ER, Ching W. The use of ceramics for bone replacement. A comparative study of three different porous ceramics. J Bone Joint Surg Br 1984;66B:269-275.
6. Kuzyk PRT, Saccone M, Sprague S, Simunovic N, Bhandari M, Schemitsch EH. Cross-linked versus conventional polyethylene for total hip replacement. J Bone Joint Surg Br 2011;93B:593-600.
7. Keijo Mäkelä T, Antti Eskelinen, Pekka Pulkkinen, Pekka Paavolainen, Ville Remes. Total Hip Arthroplasty for Primary Osteoarthritis in Patients Fifty-five Years of Age or Older: An Analysis of the Finnish Arthroplasty Registry The Journal of Bone & Joint Surgery 2008;90:2160-2170.
8. Kjell Keisu S, Fabio Orozco, Peter Sharkey F, William Hozack J, Richard Rothman H. Primary Cementless Total Hip Arthroplasty in Octogenarians: Two to Eleven-Year Follow-up, J. Bone Joint Surg. Am. 2001;83(3):359-359.
9. Kristoff Corten, Richard McCalden W, Yeesze Teo, Kory Charron D, Steven MacDonald J, Robert Bourne B. Midterm Results of 506 Solid Trispike Reflection Cementless Acetabular Components for Primary Total Hip Arthroplasty. The journal of arthroplasty 2011;00:1-6.
10. Dhaon BK, Anuj Jaiswal, Vishal Nigam, Vineet Jain. Noncemented total hip replacement in various disorders of the hip, Indian journal of orthopaedics 2005;39(4):225-227.
11. Harkess JW, Crockarell JR Jr. Arthroplasty of the Hip. In:

Canale ST and Beaty JH, editors. Campbell's Operative Orthopaedics, 11<sup>th</sup> ed. Philadelphia: Mosby 2008, 312-482.

12. Ji-Ho Lee, Byung Woo Lee, byoung-Joo Lee, Shin-Yoon Kim. Midterm results of primary total hip arthroplasty using highly cross-linked polyethylene. The Journal of Arthroplasty 2011;26(7):1014-1019.