International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2018; 4(2): 308-312

www.orthopaper.com
Received: 16-02-2018
Accepted: 20-03-2018

Dr. Tarun V Desai
Assistant Professor, Department of Orthopaedics, GMERS Medical College and General Hospital, Gotri, Vadodara, Gujarat, India

Dr. Niravkumar P Moradiya
Assistant Professor, Department of Orthopaedics, Government Medical College and Civil Hospital, Surat, Gujarat, India

Correspondence
Dr. Niravkumar P Moradiya
Assistant Professor, Department of Orthopaedics, Government Medical College and Civil Hospital, Surat, Gujarat, India

Results of uncemented total hip replacement

Dr. Tarun V Desai and Dr. Niravkumar P Moradiya

DOI: https://doi.org/10.22271/ortho.2018.v4.i2e.45

Abstract
Background: Indian surgeons annually perform more than 150,000 total hip replacements (THRs), 90% of which are primary procedures. Improved surgical technique and instrumentation have expanded the clinical indications for Uncemented THR.
Aim: To study the results of Uncemented Total Hip Replacement.
Materials and Methods: All the patients were evaluated clinically (according to Modified Harris Hip Score) and radiologically at 6 months post operatively and were followed up to 3 years.
Results: The patients operated in our study had an average Modified Harris Hip Score 97.25.
Discussion: Compare the preoperative and postoperative modified Harris hip score.
Conclusion: Results of Uncemented total hip replacement are excellent and good.

Keywords: Uncemented total hip replacement, modified harris hip score, avascular necrosis

1. Introduction
We, in our institute began Total Hip Replacement which is one of the most successful orthopaedic procedures performed n*ow* days, as a form of treatment for various hip pathologies. The surgery has gained popularity gradually amongst the patient population reporting at our institute. Also, these varieties of Replacement required rigorous life style modifications such as avoiding squatting, cross legged sitting, etc often rendering the patient incapable of earning a daily livelihood. This work is the story of evolution of Uncemented Total Hip Replacements in our institute, from conventional techniques to recent advances in this field and their results.
For patients with hip arthritis due to a variety of conditions, THR can relieve pain, can restore function, and can improve quality of life. THR is a procedure whereby the diseased articular surfaces are replaced with synthetic materials, thus relieving pain and improving joint kinematics and function.
Sir John Charnley, a British orthopaedic surgeon, developed the fundamental principles of the artificial hip and is credited as the father of THR. With the introduction of the Charnley low-friction Replacement, acrylic cement became the standard for femoral component fixation. Charnley systematically promoted THR, based on the concept of low friction Replacement by: (1) fixation with bone cement; (2) adoption of a 22-mm femoral head; (3) adoption of ultra-high molecular weight polyethylene (UHMWPE); and (4) preparation of a manual of the surgical procedure.
However, the poor outcomes of early cemented THRs were due to the implant design and cementing technique in many cases. However, at that time cement it-self was considered the cause, and loosening was called "cement disease." In response to the problem of loosening of the stem and cup, press fit porous coated and hydroxyapatite-coated stems and cups have been investigated as ways to eliminate the use of cement and to use bone ingrowth or ongrowth as a means of achieving durable skeletal fixation. Advances in stem design have dramatically improved the long term survivorship of uncemented stems.

2. Aims and Objectives
1. To evaluate the results of long and short term Follow-up of patients of Total Uncemented Hip Replacement operated at our institute.
2. To analyze the complications thereof and assess the cause critically.

3. To learn from our own experience of Uncemented Total Hip Replacement in view of the available world literature for better long term results in the future.

3. Purpose of the study

Total Hip Replacement has evolved from treating degenerative joint disease due to avascular necrosis, to difficult condition like arthritis including rheumatoid arthritis and ankylosing spondylitis. Surgical treatment of such conditions particularly by hip replacement offers an opportunity not only to replace the articular surface of the joint but also to improve the long term mechanical function by decreasing the load on the joint.

4. Methodology

a. **Study design:** Retrospective and Prospective Observational study.
b. **Sample size:** 25 patients
c. **Inclusion criteria:** All patients who were operated for Uncemented THR.
d. **Exclusion criteria:** patients who don't come for follow up after Uncemented THR.
e. **Outcome parameters:** Periodic assessment clinically according to Modified Harris Hip Scoring system and radiologically according to X rays at 6weeks, 3months, 6 months, 1 year, 2 year, 3 year follow up.
f. **Pre-operative Assessment:**
Routine blood investigations- CBC, ESR, CRP, RA, PTINR, Sickling, RBS, Urea, Creatinine, Urine-R and M
Radiological assessment- Patient's X-ray of pelvis both AP and Frog-leg view was taken. Templating was done to measure the expected size of prosthesis and the limb-length discrepancy. After the patient was fit for surgery medically and anesthetically, we posted the patient for surgery.
g. **Type of Anesthesia:** Spinal Anesthesia/ Spinal plus Epidural Anesthesia
h. **Approach**: All the patients were operated using Modified Gibson's Approach to the hip joint in lateral position on a straight table.
i. **Post-operative Management***:* Prophylactic antibiotics (intravenous as well as oral) were continued for 5-14 days postoperatively depending upon the status of the dressings, approximately 5-7 days of intravenous antibiotics followed by oral antibiotics till the sutures were removed. Negative suction drain was removed 48 hours after surgery, depending upon the drain output. X-ray was done usually on the third post-operative day (before weight bearing) when the patient was more comfortable. Sutures were removed on 10^{th}-14^{th} day after surgery routinely depending on the status of the dressing and the local part. All patients under this study received prophylaxis to prevent deep vein thrombosis and pulmonary embolism with Tablet Rivaroxaban (10 mg) once at night for 15 days from the day of surgery. Under normal circumstances, with the patient being stable postoperatively, static and active quadriceps exercises were begun on the same evening within the limits of comfort followed by high sitting on the day of drain removal. This was followed by non-weight bearing crutch walking of the patient with the help of a walker for a period of three weeks. The patients were advised to start partial weight bearing at three weeks as per pain tolerance and on table stability of the implant. Full weight bearing without any support was started at 6-8 weeks post-operatively in uncomplicated cases after clinical and radiological assessment. Patients were instructed not to squat, sit cross-legged or to indulge in active sports. They were advised to use western style toilets.
j. **Follow up***:* Patients were followed up at 6 weeks, 3months and 6 months. The patients were assessed at each follow-up with proper clinical and x-ray evaluation as per guidelines discussed elsewhere in this study.

5. Results

1. In our series, age varied from 18 to 65 years, with a mean age of 41-50 years. There was male predominance. Male: Female ratio was -2:1. Majority of our patients were labourers by occupation. 13(51%) operated hips had moderate to high physically active life style. The main indication of surgery was-avascular necrosis of hip (68%), Idiopathic was commonest (36%) followed by Post-traumatic avascular necrosis (12%) followed by Sickle cell disease (8%). Second indication of surgery was Arthritis (16%), Rheumatoid arthritis was commonest (12%) followed by Ankylosing Spondylitis (4%). Another Indication of surgery was implant failure (16%). 9(36%) patients were operated on left side and 6(24%) on right side. 10(40%) Patients were operated for total hip replacement on both sides. Intra-Operatively, no complications were encountered in any patient. Average blood transfusion for each surgery was 1.7 units.
2. Post-Operatively out of 25 patients, 1 patients had sciatic nerve palsy, 1 had local infection, 1 had pulmonary embolism and 2 patients had Postoperative dislocation. 1 patients had Diabetes mellitus, 4 had hypertension and 4 had sickle cell disease. Out of 25 patients, 23(92%) patients had no pain at all while two patients had minimal pain. None of our patient presented with limp at one year of follow-up. 19 patients (76%) of our patients were able to manage to walk without support while 6(24%) patients required cane for long distance walk. 20(80%) patients were able to walk for unlimited distance, while 5(20%) of patients were able to walk for 1 kilo-metre without distress. 2 (84%) of patients were able to climb stairs without holding railing, while 8(16%) patients required support of railing. All of our patients were able to sit comfortably in ordinary chair for 1 hour. All of our patients were able to wear foot-wear comfortably. All of our patients were able to use public transport with ease.
3. On final follow-up, 24(96%) patients had excellent result and 1(4%) had good result. None of our patients had Fair/Poor results. Preoperative mean modified Harris hip score was 57.50 compared to postoperative score of 97.25.

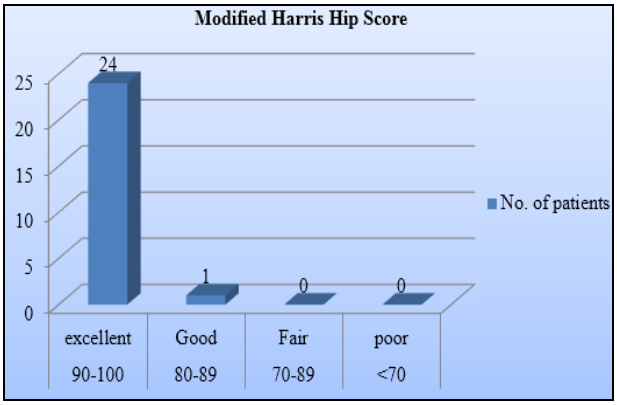

Table 1: Modified Harris Hip Score

Sr.no	score	Result	No. of patients
1	90-100	Excellent	24
2	80-89	Good	1
3	70-89	Fair	0
4	<70	Poor	0

Table 2: Range Of Movements

Range of Movement/ Deformity	Preoperative range	Postoperative range
Fixed flexion deformity	10 cases	Nil
Flexion	20° - 60°	90° -130°
Abd/Add Deformity	5/12	Nil
Abduction	10°-30°	30°-50°
Adduction	0°-20°	0°-30°
External Rotation	10°- 30°	30°-50°
Internal Rotation	0°-10°	0°-20°

Pre-operative X-rays

Post-operative X-ray **X-rays follow-up 6 Months**

Patient's Functional Outcome and Range of Movements at Final Follow-Up

Case 1: A case of bilateral uncemented total hip Replacement in a known case of sickle cell disease (with bilateral avascular necrosis of femoral head) without neurovascular deficit.

Pre-operative X-ray

Post-operative X-ray **X-rays Final follow-up**

Patient's functional outcome and range of movements at final follow-up

Case 2: A case of left uncemented total hip Replacement in case of implant failure in case of 1 year back operated Left cemented bipolar without neurovascular deficit.

6. Discussion and Analysis

The present study was aimed at evaluating the results of uncemented total hip Replacement in Indian population, performed at our institute involving a strict preoperative, intraoperative and postoperative protocol. From this study, we have concluded that operative treatment for various hip disorders in the form of uncemented total hip Replacement has helped in alleviation of intractable pain, resumption of ambulation and return to functional activity. The longevity of the Uncemented Replacement systems, their usefulness in overcoming the pitfalls of cemented total hip athroplasties like the short duration of implant life, osteolysis and bone loss, subsequently needing revision surgeries at a later date, which are complicating and do not always yield satisfactory results, the excellent short and medium term outcome of Uncemented total hip Replacement in young active as well as older individuals, have decreased the chances of failures. In Indian population, avascular necrosis of hip is the main indication for this surgery. This surgery has gradually gained good popularity since its inception amongst the patient population reporting at our institute.

Our study consisted of 25 uncemented total hip Replacement with an average follow up period of 3 years. The male to female ratio in our series was approximately 2:1. In our series, this disproportionate representation of males and females in total hip Replacement probably is due to higher incidence of idiopathic avascular necrosis of femoral head in males. Our series revealed longstanding avascular necrosis of hip joint with arthritis and deformities to be the prime indicator of total hip Replacement in all the age groups.

Most of our patients, being middle-aged, were occupied into moderate physical activity. Majority of them were able to carry out their occupations without any hindrance post-operatively after recovery. Even the highly active patients were fully satisfied with the performance of their hip joints.

In our study 2 patients had episode of post-operative dislocation, which was relocated under general anaesthesia. Our series noted incidence of dislocation to be 8%. Some patients in whom compliance was doubtful were immobilized in abduction pillow for periods of 3-6 weeks. Two patients had early infection which was treated with debridement and antibiotics. None of our patients developed cardiopulmonary complications during surgery or anaesthesia so as to require prolonged monitoring/ventilator support.

Many of the patients in our series suffered from one or more systemic illness ranging from diabetes mellitus, hypertension, ankylosing spondylitis and sickle cell disease. Thus total hip Replacement, though a major surgery can be performed safely and effectively in patients with systemic diseases.

All the patients in our institute were treated by Modified Gibson's approach. The same had been followed by *Chandler et al.* Posterior dislocation was found only in two patients. Similar observation had been made by *Charnley, Lawrence et al.* Though no comparison with any other approach could be made in our series (because all the cases were done with modified Gibson's approach) the ease and reliability of this approach was well established.

Of the 25 patients Uncemented total hip Replacement performed in our study, 2 patients were of ceramic on ceramic variety, 1 patient was treated with solution femoral reconstruction system, and 3 patients were treated with pinnacle hip system, while the remaining majority of the patients 19 were treated with Corail with Duraloc hip systems. 50mm Acetabular Component was found to be the most common size used in patients in our study followed by size 52mm. Size 11 Femoral Component was the most common size of femoral component used, in cases where Corail with Duraloc hip system was used in our study.

Our study did not reveal any aseptic loosening of either the femoral or the acetabular components on the medium term follow-up of these patients. However, these cases would require a longer follow-up study to evaluate their result with respect to aseptic loosening.

We found 71% of femoral components to be in neutral and 23% to be in valgus and 6% to be in varus. Although 6% of the femoral stems were in varus, on final follow-up their overall functional outcome was excellent even at an average 1 year follow-up. All the acetabular comoponents were placed in normal anteversion and inclination; the better placement of acetabular and femoral components could have been a reason for only one incidence of dislocation in our series.

At 1 year follow up, the average flexion at hip was up to 90-130°, abduction was 30-50°, adduction was 0-30°, external rotation 30-50° and internal rotation was 0-20°. Overall, our results are similar to previously published series in the literature.

However, we would like to highlight a number of factors evident in our experience which we would consider useful when considering these procedures. We found preoperative planning to be of value in considering selection of implant, requirement of bone grafts, offset and leg length inequality. We believe that accurate reconstruction of the axes gives the previously weak abductor musculature the best chance of strengthening. Leg length correction has to be limited due to the potential risk of damage to the sciatic nerve. Maximum length that can be gained with safety at the time of total hip replacement should be no more than 4 cm. We felt that a modular prosthesis might be useful in the versatility it

provided to correct version, offset and limb-length. We felt that prophylactic measures to prevent heterotopic ossification should be made. We recommend nonsteroidal anti-inflammatory drugs for ease of use. Finally careful patient communication is important. Patients must be aware of higher complication rates compared with primary Replacement and the requirement of lifestyle modification for better outcome and longevity of the hip.

7. Conclusion

Uncemented Total Hip Replacement is a procedure which provides a nearly physiological joint and with experience, proper instrumentation, proper selection of implants, its placement in correct version and inclination, excellent results could be achieved with nil or minimal complication rate.

8. References

1. 10 year results of uncemented metaphyseal fit modular stem in elderly patients. Indian j orthop. june-aug. 2011; 45(4):351-358
   PMCDI: PMC 3134022
2. Twenty year results of the uncemented corail stem. International orthopaedics (SICOT) (2011) Springer-verlag. 2010; 35; 189-194.
3. Fifteen to 20 year results of Uncemented tepered fully porous-coated cobalt-chrome stens International orthopaedics (SICOT) (2008) Springer-verlag 2007; 32:317-323.
4. Minimum 5-year Follow-up for Primary THR Using a Tapered, Proximally Coated Uncemented Stem Frank R. Kolisek, MD; Kimona Issa, MD; Steven F. Harwin, MD; *et al*.
5. Total hip Replacement with an Uncemented femoral component excellent results at ten-year follow-up jeffrey r. Mclaughlin, kyla r. Lee From the Kennedy Center for the Hip and Knee, Neenah, USA
6. Seven-year Results of a Tapered, Titanium, Hydroxyapatite-Coated Uncemented Femoral Stem in Primary Total Hip Replacement Jin-Ho Cho, MD, Jona THRn P. Garino, MD, Suk-Kyu Choo, MD, Z *et al*. Department of Orthopaedic Surgery, Ilsan Paik Hospital, Inje University College of Medicine, Goyang, Korea, Department of Orthopaedic Surgery, Presbyterian Medical Center, University of Pennsylvania, Philadelphia, PA, USA, Department of Orthopaedic Surgery, Kangwon National University Hospital, Chuncheon, Korea
7. Long-term results of the ABG-1 hydroxyapatite coated total hip Replacement: Analysis of 111 cases with a minimum follow-up of 10 years R. Bidar, P. Kouyoumdjian, E. Munini, *et al*. Department of Orthopaedics and Traumatology, Carémeau Teaching Hospital Center, place du Pr-Robert-Debré, 30029 Nîmes cedex 9, France Accepted: 5 October, 2009.
8. Uncemented Total Hip Replacement in Patients Younger THRn 50 Years: A 6- to 10-Year Follow-up Study. Tian J Liang, PhD; Mu Z. You, PhD; Pei F. Xing, MD; *et al*.
9. 9Long-Term Follow-Up Results of a Second-Generation Uncemented Femoral Prosthesis with a Collar and Straight Distal Fixation Channels Chang Wook Han,1 Ick Hwan Yang,1 Hye Yeon Lee, *et al*. Han1 Departments of 1Orthopaedic Surgery and 2 Anatomy, Yonsei University College of Medicine, Seoul, Korea.
10. Excellent results with Uncemented total hip Replacement and alumina-on-alumina pairing: minimum ten-year follow-up Alexander M. Kress; Rainer Schmidt; Ulrich Holzwarth *et al*. Received: 14 October 2010/Revised: 23 October 2010/Accepted: 23 October 2010/Published online: 16 November, 2010.
11. The Bicontact Uncemented primary total hip Replacement: long-term results Girish Swamy & Alistair Pace & Conal Quah & Peter Howard Received: 20 August 2010/Accepted: 25 August 2010/Published online: 10 September 2010 # Springer-Verlag, 2010.
12. Uncemented Total Hip Replacement With a Tapered Femoral Component: A 22-to 26-year Follow-up Study Jeffrey R. McLaughlin, MD; Kyla R. Lee, MD Orthopedics, 2010; 33(9).
13. Uncemented Total Hip Replacement: Past, Present, and Future Harumoto Yamada1, Yasuo Yoshihara 2, Osamu Henmi 3, *et al*.
14. Total Hip Replacement-over 100 years of operatives history Orthopedic Reviews; Stephen Richard Knight, Randeep Aujla, Satya Prasad Biswas University of Leicester; University Hospitals of Leicester, Medical School, Leicester; Kettering General Hospital,Kettering, UK. 2011; 3:e16.
15. Textbook of Campbell: 12th addition, chapter 3-Replacement of hip, 1.
16. Rockwood and green's fractures in adults,seventh addition, 2, 1561-1597.