

## STUDY OF FUNCTIONAL RESULTS OF CEMENTED TOTAL HIP REPLACEMENT BY MOORE'S APPROACH

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### ABSTRACT

#### INTRODUCTION

The total hip replacement (THR) has probably become the surgical procedure of choice for wide variety of hip joint disabling diseases. The prosthesis used for THR is often grouped into cemented, cement-less and hybrid ones. There has been increasing trends in use of cement-less components citing more number of complications namely loosening, increased infection rate etc. however with additional cost factors as well. We conducted this study to ascertain whether in a developing country like ours should we really switch over to un-cemented hip replacements dreading such complications or can we still use cemented prosthesis with equally good if not better results.

#### METHODS

A study of functional results of cemented total hip replacement was done in patients with varied age groups ranging from 40 years to 75 years with the average age being 54.8 years. 20 patients with 21 diseased hips were treated with cemented total hip replacement by Moore's posterior approach at NSCB Subharti medical college, Meerut, UP from December 2010 to December 2013 and reviewed thereafter with an average follow-up period of 4.2 years. Average surgical time required was one and half hour. Patients were asked to come for follow up on 1st month, 3rd month and 6th month and then every 6 months and were assessed as per modified Harris Hip Score.

#### RESULTS

All the patients were evaluated according to the Modified Harris Hip Scoring system. The results showed 14(67%) hips with excellent results, 4(19%) with good results, and 3(14%) hips with fair results. No poor outcome was noted in this study. 2 cases of dislocation (10%) were noted one on the 5th post-operative day and the other occurred after the patient was discharged from the institution.

#### CONCLUSIONS

The management of diseased and destroyed hips with chronic pain with cemented total hip replacement is effective and gives stable, mobile and painless hip joint to the patient. Functional results are excellent and complications are minimal if done with utmost care and precision.

#### KEYWORDS

Total hip replacement, Cemented, Moore's approach.

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**INTRODUCTION:** Osteoarthritis of the hip, may it primary or secondary, has been troublesome problem since long. No race has been exempted from the disease and the aetiology of the condition has been subject of controversy and speculation.<sup>1</sup> Almost all patients who consult the surgeon do so because of intractable pain. Many patients also have limitation of the motion but the primary goal of operative treatment is to relieve pain.<sup>2</sup>

Total hip replacement was introduced as a panacea to relieve the intractable pain of hip arthritis. Additional objectives of deformity correction and restoration of hip mobility and stability were achieved later. It has provided millions with the ability to lead a normal life.<sup>1,3</sup>

The prosthesis used for THR is often grouped into cemented, cement-less and hybrid ones. There has been increasing trends in use of cement-less components citing more number of complications namely loosening, increased infection rate etc. however with additional cost factors as well.<sup>4</sup>

The crux of cemented THR surgery lies in the use of cement. By means of cement the load of the body weight is distributed over a large area of bone.<sup>5</sup> The beauty of the acrylic-fixed hip replacement is in the almost uniform early

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absence of pain. The immediate pain relief, stable fixation, rapid rehabilitation has proved to be doing wonders for patients with hip disorders requiring replacement surgeries.<sup>6</sup> Since it has been proved that the best time to use acrylic cement is the "First time", the surgery should be done with utmost technical precision for long term results.<sup>1,4,5</sup> We at our institute have been using cemented THR since long and have not come across such complications in general pertaining cemented implant. In a developing country like us shall we really switch over to costlier un-cemented dreading such complications or can we still use cemented prosthesis with equally good if not better results. To ascertain this and to evaluate the functional outcomes of Cemented Total Hip Replacement this study was performed at NSCB Subharti medical college, Meerut, UP from December 2012 to December 2015.

**METHODS:** In this study 20 patients with 21 hips, aged between 45 and 75 years, with diseased and destroyed hips who had developed painful arthritis were treated with cemented total hip replacement at NSCB Subharti Medical College, Meerut from December 2010 to December 2013. The follow up ranged from 3 to 6 years. Patients above 40 years of age without active infection with painful diseased and destructed hip were included in the study.

**Preoperative Assessment:** The patients were evaluated according to the modified Harris hip scoring system.<sup>7</sup> The scores taken into account were of pain, function, range of motion, and deformities. Also a mention of the limb length discrepancy and flexion contracture is made. Physical examination included examination of spine and both lower extremities including opposite hip, both knees and foot. Any occult infections like skin lesions, dental caries and urinary tract infections were identified and treated preoperatively. Routine blood investigations were done for all the patients. Special attention was paid to CRP and ESR and if these were abnormal, surgery was deferred.

**Roentgenographic Evaluation:** The goal of preoperative radiographic assessment is to confirm the diagnosis, to determine anatomic relationship of the femur and pelvis to allow for accurate restoration of joint anatomy and biomechanics. Standard pelvic roentgenogram anteroposterior view of both hips in 15 degrees of internal rotation and lateral X-ray of hip were taken. X- Rays of spine and knees were also taken to know their status. Following features were noted.

**Femur:** Bone stock, medullary cavity, limb length discrepancy and neck length.

**Acetabulum:** Bone stock, floor, migration, protrusion, osteophytes and approximate cup size.

Templating was done with the use of plastic overlay templates supplied by the prosthesis manufacturer both for femoral and acetabular components to aid in selection of the type of implant that will provide the best fit, implant size and neck length required to restore equal limb lengths and medial offset.

The posterior Moore's approach<sup>8,9</sup> was followed for all the cases. Forty grams of bone cement was used for each of femoral and acetabular component.

**Post-operative Management:** Limb was kept in abduction with abduction pillow in between the lower limbs. Vitals were monitored carefully for 48 hours. Intra venous antibiotics are continued for 2 days. Drain removed and tip sent for culture and sensitivity after 48 hours and check X-rays performed. Patient was allowed to ambulate the next day of surgery with weight bearing as per pain tolerance.

**Follow-up:** In our study, patients on discharge were advised to report after 1<sup>st</sup> month, 2<sup>nd</sup> month, 3<sup>rd</sup> month and 6<sup>th</sup> month and every 6 months thereafter. At the follow-up a detailed clinical examination was done and patient was assessed subjectively for symptoms like pain, swelling and restriction of joint motion. Modified Harris hip scoring system<sup>7</sup> was used for evaluation. On clinical examination, examination for tenderness, range of movements of the joint and limb length discrepancy was noted. Check X-rays were taken to study for any signs of complications of the procedure.

**RESULTS:** This series consisted of 20 patients with 21 diseased hips treated with cemented total hip replacement between December 2010 to December 2013.

The follow- up ranged from 3 years to 6 years. Results were analysed both clinically and radiologically. Out of 20 patients, 10 patients (50%) belonged to the age group between 45-55 years of age. 8 patients (40%) belonged to age group between 56-65 years of age and 2 patients (10%) were in the age group between 66-75 years of age. The youngest patient was 45 years old and the oldest patient was 70 years old. The mean age of our study was 54.8 years. Out of 20 patients, 14(70%) were males and 6(30%) were females, thus showing a male preponderance. In our study, 8(40%) patients had right sided affection, whereas 6 (30%) had left sided affection and 6(30%) had bilateral hip joint affections. Out of 6 cases of bilateral hip joint involvement, only 1 case got operated on both the sides at our institution. The most common indication for surgery was secondary osteoarthritis of the hip, the number of patients being 15(75%). The other causes were non-union fracture neck of femur, the number being 3(15%) and lastly early and intermediate stages of avascular necrosis of the head of femur which still had not progressed to arthritic stage, the no. of patients being 2(10%). The causes of secondary osteoarthritis of the hip were advanced stages of avascular necrosis of the head of femur in 10(66.6%) no of cases, Rheumatoid arthritis in 2(15%), healed tuberculosis in 2(15%) and old trauma to hip joint in 1(7.5%) 12 patients with 13 diseased hips (62%) were treated with Charnley type of implant whereas 8 patients with 8 diseased hips (38%) were treated with Modular type of implant.

**Complications:** We had 2 cases (10%) of posterior dislocations in our study. One case got dislocated on the 5th post – operative day while the patient was trying to sleep on the lateral position in the bed and the other occurred after the patient was discharged from our institution. Both the cases were managed by closed reduction following Allis’ technique and fixed traction on a Thomas splint for a period of 3 weeks. The patients were then discharged and regularly followed- up. No further episodes of re-dislocation were noted. A known complication of this surgery is trochanteric non union and is seen in lateral approaches.<sup>8,9</sup> But as this study was conducted using a posterior approach, this complication was not encountered. No other complications were noticed in the patients during the period of this study. Functional outcome of the procedure was done by following the Harris Hip Score (Modified)<sup>7</sup> The results are shown in figure 2. No poor outcome was noted in the study.

**DISCUSSION:** Total hip replacement is somewhat a permanent method of relieving pain in the hip due to various conditions. The aim of the surgery was to relieve pain, at the same time to preserve motion and stability of the joint. Cemented total hip replacement has some limitations like the long term complications associated with the cementing technique mainly aseptic loosening and difficult revision surgeries.<sup>10</sup> The challenge comes when patients of younger age group are to be operated because, then every technical detail must be used and followed so that the patient has a reasonable chance of 20 of more years of trouble free activity and survival.

A number of series have proved the clinical efficacy of cemented total hip replacement and several published series have proved that it can provide satisfactory durability for most patients even at intervals of 20 years or more after surgery.<sup>11,12</sup>

The strength of our study is that all hips were primary arthroplasties; all were done using a uniform technique, done by same surgeon and no patient lost for follow - up. The limitation of the study is that the sample size is less and the follow-up duration is not very long so as to demonstrate the long term complications of this procedure.

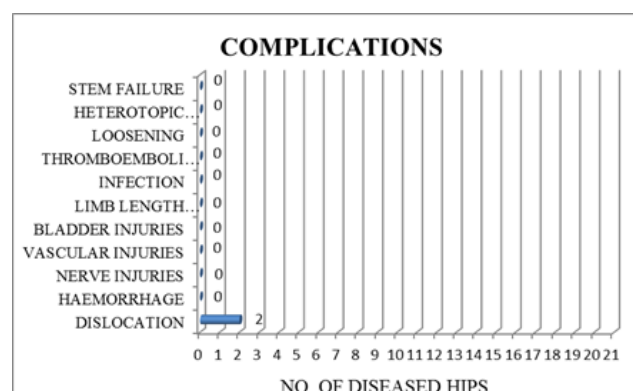
In our study, the only complication we had were 2 cases (10%) of posterior dislocations noted. One case got dislocated on the 5th post – operative day while the patient was trying to sleep on the lateral position in the bed and the other occurred after the patient was discharged from our institution. Amstutz<sup>13</sup> et al. in their study have reported a 3% incidence of dislocation of hip in first week. In our study, 1 of the 2 cases (5%) had dislocation in the 1st week. Fackler CD<sup>14</sup> et al. in their study have reported a 2% incidence of dislocation after primary hip arthroplasty. The incidence of dislocation in this study is comparable to the rate of dislocation (8.9%) noted in the study conducted by Turner.<sup>15</sup> These dislocations of hip cannot be associated with cemented implant only.

In this study, we have noted excellent outcome in 14 operated hips (67%), good in 4 hips (19%) and fair results in 3 hips (14%). No poor results were noted. Hence,

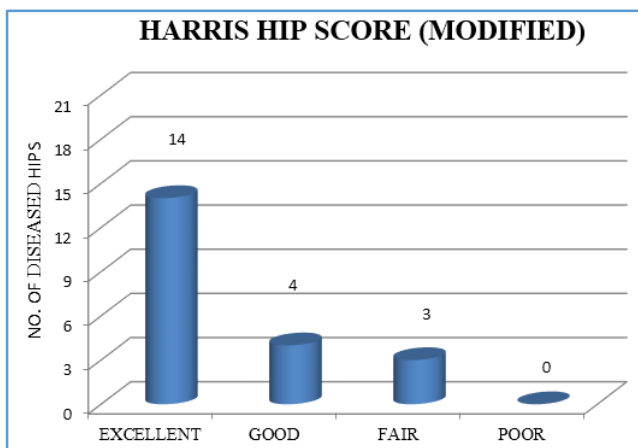
excellent or good results were noted in 18 hips (86%) whereas fair or poor results were noted in 3 hips (14%). The outcome noted in this series is comparable to other studies which had a long follow up period. Kavanagh<sup>11</sup> et al. (1989) conducted a study in 170 out of the 333 operated cases of Charnley THR over 15 years. It was noted that excellent or good results were noted in 78% of the hips. In study conducted by Schulte<sup>12</sup> et al. in 322 hips out of 330 operated hips in a 2 year period had 86% excellent or good results and 14% fair or poor results. This outcome is comparable with the long term studies conducted by Kavanagh<sup>11</sup> et al. and Schulte<sup>12</sup> et al. although long term follow up is required in our study for assessment of late complications.

The excellent results in this series and also in other studies suggest that early complete abandonment of the cemented implant by some surgeons (especially in the older and less active patient) might have been premature.<sup>4</sup>

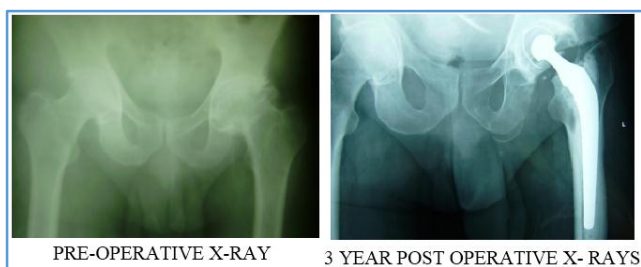
The issue of which prosthesis to use for which patient is a complicated one and the training of the surgeon in cementing technique as well as cost must be taken into account along with long-term results. The assessment of clinical results of cemented total hip replacement has shown that there is definitive improvement with regard to pain, function and range of motion post-operatively. Based on our experience and results, we conclude that cemented total hip replacement is an excellent procedure in the management of diseased and destroyed hips with chronic and incapacitating pain and is the procedure of choice in elderly patients. Cemented total hip replacement is a cost-effective procedure. With proper patient selection, adequate planning, armamentarium, meticulous surgical technique, we have achieved results comparable to other authors. In a nutshell, in our institute, this procedure done with utmost technical precision has provided us very good clinical results. Long term studies are necessary to study the late complications and to prove the efficacy of the implants.



**Fig. 1: Graphs showing complications**



**Fig. 2: Graphs showing harris HIP score (modified)**



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