



RESULT OF UNCEMENTED TOTAL HIP ARTHROPLASTY IN AVASCULAR NECROSIS OF HIP IN SICKLE CELL POSITIVE PATIENTS

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Abstract:

Introduction: Hip arthrosis is a serious, relentlessly progressive and disabling complication in sickle cell positive patients; majority of patients are in their second to third decades of life and usually present to the Orthopedic surgeon at a late stage often after being debilitated. Early stages of osteonecrosis of femur head can be treated pharmacologically or by core decompression. Since there is late presentation by the patient, only available option for providing a good quality of life with painless mobile joint is total hip arthroplasty. In this study, we have assessed the outcome following total hip arthroplasty in the form of pain reduction, ability to perform routine activities, return to occupation, implants used, methods to reduce complications etc. Patients had improved Harris hip score following surgery with less complications which is encouraging to conduct total hip arthroplasty in sickle cell positive patients.

Material and Method: A retrospective study was carried upon 20 hips who were sickle cell positive. Complete history and physical examination and blood investigations was carried out. The onset of symptoms and their presentation was noted. Modified Harris hip scoring system was utilised for comparing pre-operative vs post-operative status.

Results: Out of 17 patients (20 hips), maximum patients had delayed presentation with a poor condition of Hip and were observed in progressed stage of the disease with deformities of hip. After total hip arthroplasty all patients were relieved from their deformities of hip. At final follow up 12 (60%) patients had excellent outcome. 3 (15%) patients had good outcome. 4 (20%) patients had fair outcome. 1 (5%) patient had poor outcome.

Conclusion: Total hip arthroplasty in sickle cell positive patients with hip arthrosis provides the patient with a stable hip and improves functional status and relieves patient's compromised lifestyle. It is a safe procedure with predictable outcomes.

Key words: Total hip arthroplasty, Sickle cell hemoglobinopathy, Hip arthrosis, Harris Hip score, Ficat Arlet Grading.

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Introduction:

Sickle cell hemoglobinopathy is a commonly inherited monogenic disorder in India; gene of which is pre-dominantly seen among tribal population⁽¹⁾ A person is said to be suffering from sickle cell disease when he/she inherits two abnormal copies of the haemoglobin gene. Sickle cell hemoglobinopathy results in anaemia and the most frequently observed clinical problem is painful vaso-occlusive crisis, which is because of clumping of sickle cells leading to impaired blood supply and thus causing morbidity⁽²⁾ The skeletal manifestations of sickle cell affects all age groups. Bony changes are due to hyperplasia of bone marrow and thrombosis that causes vascular infarction; it may sometimes resolve over days without having any permanent sequelae. The common orthopaedic problems encountered in sickle cell hemoglobinopathy are avascular necrosis of hip, osteomyelitis, septic arthritis, leg ulcer, growth retardation and skeletal immaturity, dactylitis, osteoporosis and vertebral collapse, pathological fracture, arthritis⁽³⁾ Avascular necrosis of the femoral head is one of the common skeletal sequelae of sickle cell hemoglobinopathy. Avascular necrosis (also known as osteonecrosis, bone infarction, aseptic necrosis, ischemic bone necrosis, and AVN) is a disease where there is cellular death (necrosis) of bone components due to interruption of the blood supply, without blood the bone tissue dies and the bone collapses. If avascular necrosis involves the bones of a joint, it often leads to destruction of the joint articular surfaces⁽⁴⁾ Avascular necrosis of bone, particularly of the femoral head, is challenging for patients and surgeons because it can produce significant pain and functional disability with no clearly proven ways of preventing progression of early stage disease. A variety of pharmacological & surgical methods (depending on stage of disease) are available to treat osteonecrosis of femoral head due to sickle cell hemoglobinopathy. According to recent literature total hip arthroplasty is an ideal modality for treatment of avascular necrosis of femur head in patients with sickle cell hemoglobinopathy. Since most of the patients present late (Modified Ficat Arlet stage III and stage IV) surgical intervention in the form of total hip arthroplasty is preferred to provide good quality of life. The aim of this study is to present the functional outcome, observe complications of treatment and recommend ways of improving outcome with uncemented total hip arthroplasty in avascular necrosis of femoral head in sickle cell positive patients.

Material and methods:

This is a retrospective observational study which was carried out in the Department of the Orthopaedics, Parul Sevashram Hospital, Parul University to analyze the outcome in sickle cell positive patients having hip arthrosis operated with uncemented total hip replacement from the duration of July 2019 to July 2022. In this study on the basis of following inclusion and exclusion criteria we have selected total 17 patients (20 Hips).

INCLUSION CRITERIA- 1) Patients who are skeletally mature and age more than 18 years. 2) Patients who are medically fit for surgery. 3) Patients who are sickle cell positive and are having hip arthrosis.

EXCLUSION CRITERIA- 1) Age of the patient less than 18 years and more than 60 years. 2) Patients not willing for surgical intervention.

After selecting 17 patients (20 hips) retrospective collection of geographic data was done and avascular necrosis of hip was classified using modified Ficat-Arlet classification. Patient's pre-operative functional assessment was done using modified Harris hip score system. To assess result of this study 6week, 12week, 24week and 48week follow-up data were collected.

Assessment of functional outcome:

It is assessed based on modified Harris Hip Score – It has the following components:

- 1) Pain – (44 Points Maximum)
- 2) Gait (walking maximum distance) (33 points maximum)
- 3) Functional Activity (14 points maximum)
- 4) Absence of deformity (4 points maximum)
- 5) Range of motion (5 points maximum)
- 6) Total – 100 points.

The Modified Harris Hip score is graded as follows: Score <70:poor outcome, 70-79:fair outcome, 80-89:good outcome, >90:excellent outcome.

PROCEDURE AND PROTOCOL:

All patients underwent pre-operative planning to determine the correct stem size, optimal stem positioning in the medullary canal, correct size of acetabular cup and correct inclination and anteversion of cup and to maintain equal leg length. The planning is done by using the plastic overlay templates. The templating aims in detection of the type of implant, neck length required and to determine the femoral offset. Prophylactic antibiotic was administered in the operative room

15-30 min before the skin incision. In our retrospective study all the patients were operated for uncemented total hip arthroplasty using posterior Moore's approach. In post-operative protocol IV antibiotics were continued for 5 days and oral antibiotics were given till suture removal. The drain is removed on the second postoperative day. In the immediate post op period the hip is positioned in approximately 15° of abduction by using a triangular pillow to prevent postoperative dislocation. Preoperatively the patient is stressed about do's and don'ts like not to squat, not to sit on the floor cross legged, to avoid strenuous activity and to maintain ideal body weight. In the first postoperative day bed exercises and limited mobilization started. Deep breathing, ankle pumps, quadriceps and gluteal isometrics, gentle rotational exercises begun. On the first or second postoperative day patient can sit on the side of the bed or in a chair in a semirecumbant position. Weight bearing and Gait training along with abductor strengthening exercises started after 1 Month. Between 3 to 6 months postoperatively nearly 50% of muscle strength is regained. Patients with sedentary occupation can return to work after 6 to 8 weeks. At 3 months they can do limited lifting and bending.

OBSERVATIONS AND RESULTS:

This retrospective study was carried out at Parul Sevashram Hospital, PIMSR from 2019-2022. Study included 17 patients with sickle cell hemoglobinopathy having avascular necrosis of hip. Out of 34 Hips, 20 hips underwent uncemented total hip arthroplasty (THA). In our study, out of 17 patients (20 Hips) youngest patient was 18 years old, the eldest being 52 years old. 10 (58.8%) patients belonged to age group 16-25 years. 3 (17.64%) patients belonged to age group 26-35 years. 3 (17.64%) patients belonged to age group 36-45 years. 1 (5.92%) patients belonged to age group 46-55 years. There was male preponderance, male:female ratio 1.12:1. 5 (25%) patients had pain since 4 years. 3 (15%) patients had pain since 3 years. 5 (25%) patients had pain since 2 years. 1 (5%) patient had pain since 1.5 years. 5 (25%) patients had pain since 1 year. 1 (5%) patient had pain since 6 months. 18 (90%) patients had pre-op visual analogue score 8. 1 (5%) patient had pre-op visual analogue score 7 and 1 (5%) patient had pre-op visual analogue score 6. 5% patient had pre-operative walking capacity of 50 metres. 5 (25%) patients had pre-operative walking capacity of 100 metres. 9 (45%) patients had pre-operative walking capacity of 200 metres. 3 (15%) patients had pre-operative walking capacity of 300 metres. 2 (10%)

patients had pre-operative walking capacity of 500 metres. Out of 17 patients, 3 patients had unilateral hip involvement and 14 patients had bilateral hip involvement. Out of 14 patients 3 patients were operated with bilateral total hip arthroplasty and 11 patients were operated over hip with more symptoms. 2 (10%) patients had 3 cm pre-operative shortening, 12 (60%) patients had 2 cm pre-operative shortening, 6 (30%) patients had 1 cm pre-operative shortening. 7 (35%) patients had 20 degree FFD, 4 (20%) patients had 10 degree FFD and 9 (45%) patients had no FFD. 1 (5%) patient had 30 degree FAD, 12 (60%) patients had 20 degree FAD and 7 (35%) patients had 10 degree FAD. Lowest pre-operative HARRIS HIP SCORE was 38. 10 (50%) patients had pre-operative HARRIS HIP SCORE between 51-60. 7 (35%) patients had pre-operative HARRIS HIP SCORE between 41-50 and 3 (15%) patients had pre-operative HARRIS HIP SCORE between 31-40. Pre-operative mean HARRIS HIP SCORE in our study was 49.75. Average postoperative drain output was 410 ml (range 300-600 ml). 4 patients had foot drop, 4 patients had infection, 4 patients had intra operative femur fracture. Out of which 1 patient had intra-op fracture & wound infection. 1 patient had intra-op fracture & foot drop. 1 patient had foot drop & wound infection. 11 (55%) patients had post-op visual analogue score 0. 3 (15%) patients had post-op visual analogue score 1 and 6 (30%) patient had post-op visual analogue score 2. 8 (40%) patients had no shortening at final follow up. 5 (25%) patients had 0.5 cm shortening at final follow up. 6 (30%) patients had 1 cm shortening at final follow up. And 1 (5%) patient had 4 cm shortening at final follow up. 15 (75%) patients had normal gait at final follow up. 1 (5%) patient had antalgic gait at final follow up. 4 (20%) patients had steppage gait at final follow up. No patient had fixed flexion as well as adduction deformity at final follow up. The normal values for Acetabular Inclination differ from study to study. Usually it is considered 40 +/- 10 degree. However practically range taken is 45-60 degree. 8 (42.1%) patients had acetabular inclination between 31-40 degree. 8 (42.1%) patients had acetabular inclination between 41-50 degree. 2 (10.52%) patients had acetabular inclination between 51-60 degree and 1 (5.26%) patient had acetabular inclination greater than 60°. 9 (47.36%) patients had femoral stem in neutral position. 8 (42.1%) patients had stem in valgus position and 2 (10.52%) patients had stem in varus position. Average return to occupation was 3.15 months (range 3-5 months) in 19 patients. 1 patient underwent implant removal after which he was not able to return to occupation. 12 (60%)

patients had post-operative HARRIS HIP SCORE between 90-100. 3 (15%) patients had post-operative HARRIS HIP SCORE between 81-90. 4 (20%) patients had post-operative HARRIS HIP SCORE between 71-80. 1 (5%) patient had post-operative HARRIS HIP SCORE between 61-70. 12 (60%) patients had excellent outcome. 3 (15%) patients had good outcome. 4(20%) patients had fair outcome. 1 (5%) patient had poor outcome. There was remarkable improvement in HHS which was pre-operatively below 60 for all patients. At final follow up evaluation 15 Hips had score above 80 and 4 Hips were between 71-79. 1 Hip had score between 61-70. The mean pre-op Harris Hip score was 49.75 which improved to 87.3 at final follow-up.

DISCUSSION:

Almost 50 years ago sickle cell hemoglobinopathy had high mortality with average age of survival just being 14.3 years⁽⁵⁾. However, nowadays with the advances in management and current treatment protocol regarding hydration, oxygen therapy, hydroxyurea, analgesia etc. has extended the life span of patients affected by this disease upto their 60's⁽⁶⁾. Thus, the patients thrive longer but unfortunately are burdened with one of the major complication of sickle cell hemoglobinopathy i.e. an intractable pain due to osteonecrosis of femur head.

Treatment of grade III and IV osteonecrosis of femoral head has been agreed upon in the scientific community as total hip arthroplasty (THA). However, sickle cell positive patients report substantially high perioperative complications than reported in the general orthopaedic population in terms of implant loosening, infection, revision arthroplasty⁽⁷⁾. Also previous studies of THA in sickle cell positive patients report high risk of complications than that observed after THA for other conditions. Complications can be attributed to technically challenging surgery due to changes in bone anatomy and morphology by the disease process and medical management in the perioperative period due to the nature of the disease itself.

Most patients presented to us with very severe deformity that affected the activities of daily living as evidenced by their low hip score. The challenges encountered during the surgery were related to the quality of bone of the affected patient. We had to recreate femoral canals in most cases to enable the femur take the minimal size of femoral component which was size 4. In some cases, we had fractures

while doing this and we had to perform cerclage wire around the fractures to ensure healing and femoral component stability.

Several studies were conducted over years using cementless implants for THA in sickle cell positive patients by Acurio, et al 1992, Hickman, et al 1997, Mousawi, et al 2002, Kimon Issa, et al 2003, Philippe, et al 2008, Azam MQ, et al 2016, Katchy, et al 2018, Gulati, et al 2018, Farook, et al 2019, H Mathur, et al 2019 all of them favored using cementless implants due to less complication rates as compared to cemented implants and over years medical and surgical management of sickle cell positive patients changed which lead to widespread use of cementless implants. We in present study performed cementless total hip arthroplasty in all patients. There has been a reluctance to perform THA in sickle cell positive patients as benefits have been controversial. However, in wake of the increased life expectancy, young population with sickle cell hemoglobinopathy is willing for a pain free life and frequently seeks treatment by surgery if this provides them with functional pain free life.

Present study was conducted at Parul Sevashram Hospital, PIMSR which included 17 patients (20 Hips) who were operated over a period of 2 Years. In present study mean age is 27.41 years (16 to 55 years) with male pre-ponderance 1.12:1. In our study incidence of AVN in males & females with sickle cell hemoglobinopathy was almost equal. The presenting feature of these patients have always been the pain. However if we look at the pathophysiology of avascular necrosis, the first two stages of avascular necrosis might go un-noticed to the patient. There is also a tendency to neglect the initial dull aching occasional pain therefore the mean duration of pain at presentation was 25.8 months. 95% patients had pain in the hip for more than a year. As the duration of pain increases we observed that the deformity also increases.

The common age group of occurrence of avascular necrosis of femur head in sickle cell positive patients have been found to be in the second and third decade of life. The disease modifying/protective surgeries like core decompression are not indicated in patients presenting late with stage III & IV of osteonecrosis of femur head.

One of the most effective methods of preventing progression of joint damage is bed rest, in order to avoid weight bearing (Hernigou et al, 2003), however, this has such drastic implications on

patients lives that it is usually an unacceptable option at such a young age.

In addition, the long-term symptomatic treatment is ineffective and the majority of joints require surgery for pain relief and functional improvement. A meta- analysis of 21 sickle cell patients demonstrated that, with non-operative management, only 20% of patients had satisfactory outcomes and 80% required THA or another salvage procedure ⁽⁸⁾.

In our study, patients suffering from sickle cell disease and sickle cell trait both were included, 14 (82.35%) patients were suffering from sickle cell disease and 3 (17.65%) patients were suffering from sickle cell trait out of which 3 (17.65%) patients had unilateral involvement of hip and 14 (82.35%) patients had bilateral involvement of hip. In study by Mathur, et al 10 patients had bilateral involvement of hip and 15 patients had unilateral involvement of hip. In study by Katchy, et al 8 patients had bilateral involvement of hip and 13 patients had unilateral involvement of hip. These findings suggest that late presentation to the Orthopaedic surgeon might be one of the reason for bilateral hip involvement.

Intraoperatively, 4 patients had periprosthetic fracture for which stainless steel cerclage wiring was done.



Postoperatively, the average drain output was 410 ml (range 300–600 ml). 4 patients had postoperative surgical site infection for which wound debridement was done and 1 patient had to undergo implant removal. 4 patients developed foot drop for which foot drop splint was given. None of the cases had aseptic loosening as assessed on serial radiographs. Subsidence was not noticed in any of the cases till latest followup. There were no early or late dislocations. No heterotopic ossification was seen in any of the cases. **In our study the average cup size used was 51.3** with a range of 44–58. **The average liner size was 51.3** with a range of 44–58. **The head size used was 31.4** with a range of 28–36. **The average stem size was 7.75** with a range of 4–12.

We found that all our patients had fixed adduction deformity, 11 patients had fixed flexion deformity. So the main clinical findings were fixed flexion & adduction deformity. It was observed that 10 hips had pre-op HHS less than 50 and 10 hips had pre-op HHS in between 51–60. No patients had pre-op HHS more than 60. The mean pre- op HHS in our study was 49.75.

14 patients had shortening of more than 2 cm. With fixed adduction deformity it is bound to have adduction contracture & with shortening it may also lead to either global capsule contracture or anteroinferior capsule contracture.

All patients were operated with Posterior Approach to Hip. The average operating time was 100 min (range 90–120 min). The average blood loss in patients was 495 ml (range 400–600 ml). Al-Mousawi et al. have reported an average operative time of 2.2 h and a mean operative blood loss of 1275 ml. Blood loss encountered in our study was less as surgery was performed in a setup with an experienced arthroplasty team which can be meticulous and quick in technique and can achieve adequate haemostasis during surgery.

Katchy, et al in his study observed that the average cup size used was 49.43 with a range of 46–54. The average liner size was 49.43 with a range of 46–54. The head size used in all patients was 28. The average stem size was 6.57 with a range of 6–8.

Post operative x-ray evaluation:

1) Vertical & Horizontal offset:

The vertical and horizontal offset were consistently found to be same in all patients at immediate and final follow up suggesting good bony integration. Nosinking of implant was seen in our patients.

2) Femoral stem position:

Generally neutral and valgus femoral stem position is acceptable. In our study 9 (47.36%) femoral stem were in neutral position, 8 (42.10%) stem were in valgus position and 2 (10.52%) stem were in varus position. We did not find other studies mentioning femur stem position. However it can be concluded that 89.46% femur stem were optimally positioned.

3) Acetabular inclination:

The normal values for Acetabular Inclination differ from study to study. Usually it is considered 40 +/- 10 degree⁽⁹⁾. However practically range taken is 45-60 degree. It is practiced method now to see inferior border of acetabular cup with Transverse Acetabular Ligament. As per this criteria we had ideal positioning of cup in 18 (94.72%) Hips. In 1 Hip (5.28%) we had inclination of more than 60°. Where as in study by Kakaria et al Optimal inclination of 45°-60° at the level of tear drop was observed in 80.2% cases.

We also have practice of fixing the cup with screws. By putting the screws we are improving the contact of the cup in weight bearing area and thus leads to better bony integration.

Complications in our study

In our study out of 17 patients (20 Hips), 4 (20%) patients had sciatic nerve injury, 4 (20%) patients had intra operative peri-prosthetic femur fracture, 4 (20%) patients had infection out of which 3 patients had superficial infection and 1 patient had deep infection. Patients with superficial infection presented within 4 weeks postoperatively and were treated with wound debridement. Patient with deep infection presented at 6 weeks postoperatively, patient underwent wound debridement twice and during the third presentation implant removal was done after which there were no episodes of reinfection. Causative organism for wound infection were staphylococcus aureus, klebsiella pneumonia, enterobacter cloacae.

In comparison to Mathur, et al which had just 1 patient with postoperative infection in our study we encountered 4 (20%) patients with postoperative infection.

As the patients are sickle cell positive it is very difficult to ream and raspcanal. The patients were short in stature; so while attempting reduction periprosthetic fracture was encountered in 4 patients which was managed with cerclage wire.

Sciatic nerve injury was encountered in 4 (20%) patients, in contrast to Gulati, et al & Mathur, et al study who did not have sciatic nerve injury. Injury to sciatic nerve might have occurred during hip relocation, which can be avoided in future surgeries by gradual hip relocation. Sciatic nerve injury may also occur due to tightness of implants which causes more soft tissue tension which in return causes nerve damage. More soft tissue tension is also supported by findings of no postoperative hip dislocation.

We did not encounter any cases of postoperative hip dislocation, deep vein thrombosis; no patient went into sickle cell crisis postoperatively reason being experienced arthroplasty surgeons and meticulous postoperative medical and surgical management. This is in contrast to studies by Gulati, et al and Mathur, et al where at least one patient went into sickle cell crisis.

The **Weight Bearing** after surgery in uncemented arthroplasty is controversial. Some of the authors suggest immediate weight bearing and few recommend to delay weight bearing till 4 weeks. In our study 16 patients were mobilized during the 1st week postoperatively beginning from toe touch walking to full weight bearing walking. 1 patient who had intraoperative fracture was mobilized at 3 weeks and 3 patients who had intraoperative fracture had their mobilization delayed till 5 weeks. There is a possibility that early mobilization might be a reason for non-occurrence of deep vein thrombosis.

Pain evaluation is one of the cardinal features following Hip arthroplasty. Preoperatively mean visual analogue score was 7.8 which reduced to 0.78 postoperatively, indicating hip arthroplasty to be beneficial in providing pain relief.

Residual flexion or adduction deformity leads to problems in re-habilitation of patients. Though our patients had pre-operative Fixed Flexion and Fixed Adduction deformity; at final follow-up none of our patients had any deformities.

Harris hip score is a preoperative and postoperative scoring system designed to assess patients improvement, both objectively and subjectively. We had adopted Harris hip score for evaluation of our results. All the patients showed an improvement in Harris Hip score which improved from average 49.75 points preoperatively to average 87.3 points at latest follow-up.

K. Issa, et al in his study observed that preoperative Harris hip score was 43 and postoperative Harris hip score was 87 which is almost similar to our study.

In a study by Gulati et al on sickle patients with osteonecrosis, who underwent cementless total hip replacement (THR), all patients showed an improvement in Harris hip score from 42 points preoperatively to 92 points at latest follow up.

Final outcome as per Harris hip score, in our study 12 (60%) patients had excellent outcome. 3 (15%) patients had good outcome. 4 (20%) patients had fair outcome. 1 (5%) patient had poor outcome. 4 patients had fair outcome as they had sciatic nerve injury because of which they had high steppage gait and foot drop splint was given to them. 1 patient had poor outcome as he developed deep infection for which implant removal was done.

The immediate success of Total hip arthroplasty is determined by the ability of the patient to return to maximum possible level of functional activity. Thus maximum points are given to pain and mobility of patients.

In our study we observed that 80% patients returned to their work at end of 3.15 months postoperatively. 1 patient did not return to work as he had underwent implant removal.

Restoration of the biomechanics of the hip is important for the good outcome and longevity of the prosthesis. In all our cases we tried to restore the center of rotation, limb length, medial and vertical offset and we found that the results of total hip arthroplasty encouraging.

Limitations of our study:

There are less number of patients in present study and ours is a short study with follow-up of 1 year. We strongly believe that more sample size and a long term follow-up is necessary to study hip survival rate and its complications in sickle cell positive patients.

SUMMARY:

Present study includes 17 young adults (20 Hips) who underwent total hip arthroplasty. The mean age in our study was 27.41 years which is almost similar to other studies. 9 males and 8 females participated in the study. (Male: Female 1.12:1). Almost all patients presented with stage IV AVN of femur head at 1st visit to an Orthopaedician. The mean duration of pain was 25.8 months in our study. Mean visual analogue score at 1st visit to an

Orthopaedic Surgeon was 7.8. Average height of patient was 5 feet 3 inches and average weight of the patient was 55.5 kg. In our study patients suffering from sickle cell disease 14 (82.35%) patients and sickle cell trait 3 (17.65%) patients both were included. We in our study performed uncemented total hip arthroplasty in all patients. All patients were operated with posterior approach and there were no cases of postoperative hip dislocations. Range taken for acetabular inclination differ from study to study. Usually it is considered 40 +/- 10 degree. However 45-60 degree acceptable. We had ideal positioning of cup in 18 (94.72%) Hips. In 1 Hip (5.28%) we had inclination of more than 60°. Femoral stem position was Neutral in 9 (47.36%), Valgus in 8 (42.10%) and Varus in 2 (10.52%) Hips. We were able to restore Vertical and Horizontal offsets in all patients. In our study 4 patients had intra-operative peri prosthetic femur fracture (20%), 4 had sciatic nerve injury (20%), 4 had infection (20%). Patients who had fracture and infection recovered well and those with sciatic nerve injury were given foot drop splint. 9 patients required postoperative blood transfusion as postoperative haemoglobin was ≤ 9 g %.

The mean pre-op Harris hip score in our study was 49.75, which increased to 87.3 at final follow-up. 12 (60%) patients had excellent outcome and 3 (15%) patients had good outcome in our study. 4 (20%) patients had fair results as they had sciatic nerve injury for which foot drop splint was required. Poor result in 1 (5%) patient in our study was due to deep infection which led to implant removal.

CONCLUSION:

Total hip arthroplasty can be performed in sickle cell positive patients with good clinical benefits in our environment. Cases were technically challenging, the femoral canal were comparatively narrow as compared to normal population thus smallest size femur stem was used in some patients. As the femoral canal were narrow it needed to be reamed at times with sequential cannulated intramedullary reamers. The surgeon should be aware of such conditions to avoid complications. Sickle cell positive patients tend to have sickle cell crisis postoperatively which can be prevented by adequate hydration, maintaining oxygen saturation, vigorous monitoring. Sickle cell positive patients may suffer from bacterial infection postoperatively which should be vigilantly assessed and treated. This study shows that the outcome of the total hip arthroplasty in sickle cell positive patients have

excellent results in terms of pain relief, increased walking distance, and functional capabilities. Long-term studies are necessary to confirm the superiority and improved survivorship of implants. We recommend total hip arthroplasty as surgical modality of treatment for hip arthrosis in sickle cell positive patients. Though patients are relatively young, but looking at their short life span and very severe arthritis in young age; option of total hip arthroplasty must always be considered.

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Preoperative x-ray



Immediate post op x-ray



Final follow-up xray

Clinical photos of the patient at final follow-up



Flexion



Abduction



Adduction



Internal rotation in extension



External rotation in extension



External rotation in flexion



Internal rotation in flexion



Preoperative x-ray



Immediate post op x-ray



Final follow up x-ray

Clinical photos of the patient at final follow-up



Flexion



Abduction



Adduction



Internal rotation in extension



External rotation in extension



External rotation in flexion



Internal rotation in flexion