



FUNCTIONAL OUTCOME OF UNCEMENTED TOTAL HIP ARTHROPLASTY IN ADULT POPULATION WITH AVASCULAR NECROSIS OF FEMORAL HEAD

Orthopaedics

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ABSTRACT

Introduction: Total hip arthroplasty has relieved millions of people from incapacitating hip pain (pain must be refractory to conservative measures such as oral nonsteroidal anti-inflammatory medication, weight reduction, activity restriction, and the use of supports such as a cane) and the limitation in activities of daily life that it causes. **Methodology:** Patients with avascular necrosis of femoral head in active adult population (age 21-60) treated by Uncemented Total Hip Replacement, in the Department of Orthopaedics at Sardar Patel Medical College, Bikaner, Rajasthan between December 2019 to December 2021 including follow up for 6 months and the short term functional results were analyzed by using Harris hip scoring system. **Results:** Excellent or good pain relief were obtained in 100% of patients after THR. The mean total pre operative score was 33.56, which improved post operatively to a mean score of 94.55. The most common complaint noted was anterior thigh pain (20%). 18 patients did not have any complaints. 28% of the patients who had a single or multiple complaints also showed good to excellent results. **Conclusion:** Our study suggests that implants without cement provides satisfactory clinical and radiographic outcomes in active individuals hence is a good option. Early functional results are good to excellent.

KEYWORDS

Uncemented Thr, Harris Hip Score

INTRODUCTION

Osteonecrosis of the femoral head (ONFH) is a disabling condition of the hip joint that develops when the blood supply to the femoral head is disrupted. Without adequate nourishment, the bone in the head of the femur dies and gradually collapses. As a result, the articular cartilage covering the hip bones also collapses, leading to disabling arthritis. ONFH is multifactorial that is associated with genetic predilection and exposure to certain risk factors which include chronic corticosteroid administration, chronic alcohol ingestion, smoking, and various chronic diseases (renal disease, haematological disease, inflammatory bo Total hip arthroplasty is a surgical procedure, which has relieved incapacitating pain arising from various pathologies of hip joint in millions of people. At present it is the most commonly performed adult re-constructive hip procedure.¹ The well disease, post organ transplantation, hypertension, and gout^{1,2}. The field of total joint arthroplasty is in an evolutionary state. The first total hip arthroplasty is been thought to have done in London by Phillip Wiles in 1938.⁴ The procedure is further developed in the 1950s by pioneers such as McKee and Farrar.⁵ This early work laid the groundwork for the innovative studies of Sir John Charnley who, in the late 1960s, approached the problem of artificial hip joint design by using the biomechanical principles of human hip joint function.^{6,7} The patient's function and quality of life dramatically improved with the Conventional cemented total hip arthroplasty. With contemporary prostheses and modern cementing techniques, the rate of femoral loosening also reduced substantially.⁸

Uncemented total hip arthroplasty is developed in response to evidence that cement debris causes bone lysis and plays an important role in promoting bone loosening. Prosthetic devices have been developed that can achieve fixation without cement, either by "press-fit" or by biologic ingrowth. With the press-fit technique, interference fit of the implant into the femur contributes to stabilisation. With biologic ingrowth, bone in growth into a porous surface gains fixation. Uncemented devices are most frequently used in young patients with high physical demands. Preliminary data suggest that uncemented total hip arthroplasties have a relatively low revision rate and offer a better long-term bond between the prostheses and bones durability for as long as 15 years. Uncemented prostheses are surface-engineered in one of two ways, encouraging bony interlock either by on- or ingrowth. On-growth surfaces are created by grit blasting or plasma

spraying hydroxyapatite (HA) onto the component to create a textured surfaced, with multiple indentations onto which bone can grow. The potential for improved bonding, and thus stability, through coating prostheses with bioactive materials such as HA and tricalcium phosphate, has attracted increasing interest. These compounds actively stimulate osteoblasts, rather than just providing a scaffold for adherence⁹

The Harris hip score is the most widely used scoring system for evaluating hip arthroplasty.¹⁰

MATERIAL AND METHOD

The study was Hospital based Prospective study conducted in department of Orthopaedics, SP medical college, Bikaner. 25 patients with AVN of femoral head in adult population (age 18-55yrs) was selected who were admitted in OPD basis, evaluated, operated and follow upped for 6 months between the period of December 2019 to may 2021.

Inclusion Criteria:-

- Age group 18-55yrs
- Osteonecrosis of >stage III steinberg classification of AVN femoral head.
- Unilateral and bilateral osteonecrosis of hip joint

Exclusion Criteria:

- Age group more than 55yrs and less than 18yrs.
- Other hip pathologies – infective and inflammatory arthritis
- AVN of femoral head with associated fracture like fracture neck of femur. fracture trochanter. fracture shaft of femur.
- Failed reconstruction like osteotomy. hemiarthroplasty. Resurfacing arthroplasty.

Pre-Operative Planning

Detailed history and proper clinical examination was done to determine the Duration of illness, focus of infection in the body, sensory motor examination, vascularity of limb, ambulatory status of the patient, deformities of the hip, ROM of the hip and status of the other joints. All the patients were assessed using Modified Harris Hip Score. ESR and CRP will be done to check for any ongoing infective pathology. All the routine blood investigations, chest Xray and ECG

are done. Radiogram of the pelvis with both hips with proximal half of shaft of femur AP and lateral view will be taken for all patients. Templating will be done for the acetabular and femur components. The appropriate acetabular cup size, and anteversion can be determined. On the femoral side, using a template, appropriate neck length, offset and stem size of the implant is chosen.

Intraoperative

In our study we used the posterior Moore's approach / southern approach, wherein a curvilinear incision is made over the greater trochanter and extended proximally to ream the femoral canal from the superior direction.

The hip joint is approached by splitting the gluteus maximus and incising the short external rotators by keeping it under tension by flexing the knee and rotating it externally. The sciatic nerve is protected with the help of the external rotators. The capsule is excised and the hip is dislocated posteriorly by flexing, adducting, and gently internally rotating the hip. On dislocating, the femoral head is extracted after neck osteotomy which is performed according to our pre-planned template.

The acetabulum is prepared excising the soft tissues attached to it and reaming it up to the bleeding subchondral bone. All the osteophytes, if present were excised and the wound irrigated to remove any leftover debris. Acetabular cup sizes used were one size higher than the last reamer used. We have used screws to fix the acetabular cup quadrant keeping in mind centre of the offset placed superiorly or poster superiorly.

The acetabular cup placed is packed with a mop to protect it from any debris. The proximal femur is exposed and delivered out by markedly internal rotating the limb. The femoral canal is hand reamed to the anticipated stem size as determined by templating and maintaining the anteversion. On introducing the femoral stem, the stability is tested to rotational and extraction forces and care is taken not to fracture the proximal femur. The prosthetic of the appropriate size is placed fixed with mallet over a plastic capped head impactor. A saline wash is given and any remaining debris removed. The femoral head is reduced, the stability confirmed through a functional range of motion wound is closed over a suction drain.

Post-operative care

The hip was positioned in approximately 15 degrees of abduction while the patient is recovering from the anesthetic using a triangular pillow to maintain abduction and prevent extremes of flexion. First post op day, the patient is taught static quadriceps exercises, knee and ankle mobilization exercised and made to sit.

Second post op day dressing is changed and G dress is applied. Check Xray taken.. Drains will be removed 48 hours after surgery.

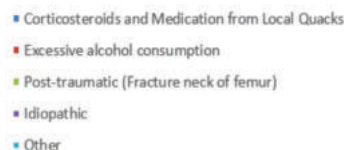
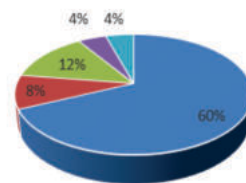
IV antibiotics were given for 5 days later switched over to oral antibiotics for further 5 days more. DVT prophylaxis is given in the form of low molecular weight heparin / heparin for first five days after surgery in patients with particular co morbidities. Gait training is started using a walker with weight bearing to tolerance. Walking distance will be increased day by day. 15th post op day sutures will be removed. The patient will be discharged from the hospital to be reviewed after one month. They were advised Not to squat/sit cross legged/use Indian toilets / to cross the lower limb across the midline. The patients were followed up at 6 weeks, 3 months, 6 months in this study.

RESULT

In the study corticosteroids & medication from local quacks was found to be the most associated risk factor as was seen in 15 patients (60%). 3 patients were post operative cc screw was done following fracture neck of femur. Other factors included other disease condition like TB and habits like excessive Cigarette smoking, tobacco chewing etc.

In the study it was found that following surgeries 5 patients had complaints anterior thigh pain, in 3 patients there was Varus positioning of femoral stem. 22 cases had no disassembly of prosthesis components; 3 (12%) patients position of femoral stem were in Valgus (all the 3 cases were previously operated following fracture neck of femur) no cases had dislocation of prosthesis. 3 patients Limb length discrepancy (>2cm) and 1 patient got infected.

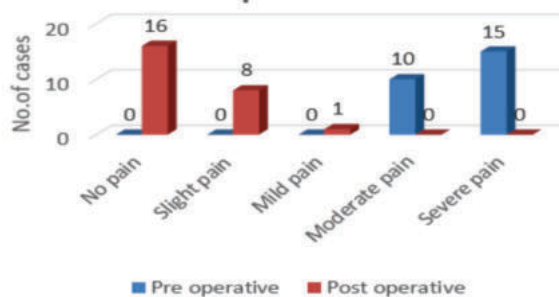
Prevalence of associated risk factors and diseases



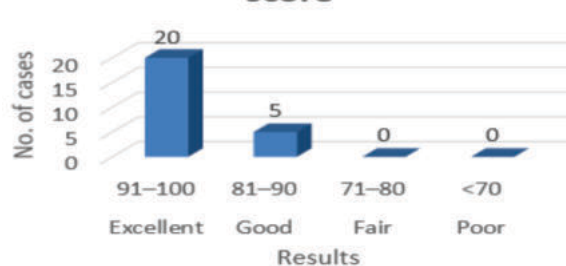
Harris Hip Score preoperative and postoperatively in different Charnley's classes (MeanSD)

Charnley's classes	Total	Pre Operative	Post operative
Class I	17	34.091.36	96.922.29
Class II	8	32.451.89	89.513.55
Class III	0	—	—
Total	25	33.561.70	94.554.43

Pain Pre Operative & Post operative



Outcome according to Harris hip score



DISCUSSION

In our study patients with Charnley's class I (Unilateral AVN) type who had a preoperative Harris Hip Score 34.091.36 improved to 96.922.29 postoperatively.

In patients with Charnley's Class II (Bilateral AVN) type who had a preoperative Harris Hip Score 32.451.89 improved to 89.513.55 postoperatively.

In total Mean preoperative Harris Hip Score were 33.561.70 improved to 94.554.43 postoperatively which is better than most of the studies as shown in table below.

CONCLUSION

Our study suggests that uncemented THR provides satisfactory clinical and radiographic outcomes in active individuals as it provided a painless and stable hip joint as postoperatively 80% cases falls in excellent category, where as 20% cases falls in good category, there is no patient on fair and poor category. 94% of cases with unilateral AVN and 50 % of cases with bilateral AVN showed excellent grade. In

present study factors affecting results were age of patients (Lower age group better results), whether bilateral or unilateral AVN and previous associated risk factors. In present study no significant correlation found between results and sex.

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