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Study of clinical and functional outcome of total hip replacement in avascular necrosis of femoral head

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Abstract
Avascular necrosis (AVN) of the femoral head is one of the common causes of painful hip in a young adult. Since young age is associated with high functional demand AVN may have a devastating effect on the quality of life. The natural course of this disease is one of relentless progression with eventual collapse of the femoral head followed by secondary osteoarthritic changes in the hip. The management depends upon many factors including severity and location of necrotic lesion, patient factors and probability of collapse. Total hip replacement (THR) is needed in cases of collapse of femoral head, severe pain, osteoarthritis or destruction of hip joint. However there has been debate over whether THR is a viable option for AVN considering unique pathophysiology of AVN. Moreover the factors like functional outcome after surgery implant longevity and need for revision surgeries must be considered while doing total hip arthroplasty. In this context we conducted this prospective observational study to find out the clinical and functional outcomes of THR in patients with of AVN.

Aims and Objectives: To study the clinical and functional outcome of total hip replacement in avascular necrosis of femoral head.

Material and methods: Patients admitted to department of orthopedics in a tertiary care hospital in a metropolitan city with diagnosis of AVN were included in the study after taking into consideration a pre-defined inclusion and exclusion criteria for the study. Sample size of 30 was considered following statistical formula and admission registry of our hospital. Patients were recruited to the study after approval from institutional ethical committee and informed consent of patients. A detailed history was taken and thorough clinical examination was done in all patients. All patients were assessed with Harris hip score and points were allocated for each components of the score, which formed base line statistics for our study. Further patients were followed up at 6 weeks, 12 weeks and 24 weeks. Patients who could not turn up to the hospital were contacted over telephone and outcome was assessed through set of questionnaire based on Harris hip score.

Result: The study consisted of 30 patients diagnosed to be having avascular necrosis of head of femur. Out of these 30 patients 23 were males and 7 patients were females with a M: F ratio of 1: 0.30. The most common age group affected was 21-40 years (43.33%) followed by 41-60 years (33.33%) and 61-80 years (23.33%). Majority of the patients with AVN had a body mass index between 25 to 29.99 (36.67%). Co-morbidities like diabetes or hypertension were seen in 11 (36.67%) patients. 9 (30%) patients were having history of either alcohol consumption or smoking. 13 patients had some predisposing factor for AVN in the form of either alcohol consumption, steroid therapy, history of trauma or pregnancy and rest of the patients were found to be having idiopathic AVN. The most common presenting complaints in the studied cases were found to be pain and difficulty in walking (90%) and most of the patients (43.33%) had symptoms for more than 1 year. Majority of the patients had right hip joint involvement (56.67%) followed by left (36.67%) and only in 2 patients (6.67%) there was bilateral involvement of hip joint. Out of the study cases 28 (93.33%) patient had cemented total hip arthroplasty while non-cemented total hip arthroplasty was seen in only 2 (6.67%) patients. There was a statistically significant difference in preoperative and postoperative total Harris hip score, pain score, range of motion, gait and daily activities like climbing stairs and distance walked. Finally in this study 28 (93.33%) patients had excellent results while 2 (6.67%) had good functional outcome after total hip replacement for avascular necrosis of femoral head.

Conclusion: There was significant improvement in clinical and functional outcome after Total Hip Replacement in patients with avascular necrosis of femoral head and we recommend Total hip replacement as surgical modality of treatment for Ficat and Arlet stage 3 and 4 of avascular necrosis of femoral head.

Keywords: Avascular Necrosis of Femural Head, Total Hip Replacement, Harris Hip Score, Functional Outcome

Introduction

Normal hip joint is subjected to various stresses and strains during every day activities performed by an individual. As hip joint is one of the major weight bearing joints of the body, it's physiologically normal functioning is essential for peaceful and enjoyable day-to-day life. Avascular necrosis of the femoral head is one of the common causes of painful hip in a young adult [1]. The natural course of this disease is one of relentless progression with eventual collapse of the femoral head, followed by secondary osteoarthritic changes in the hip. Primarily, it is due to lack of blood supply. Also called osteonecrosis, avascular necrosis can lead to tiny breaks in the bone and the bone's eventual collapse. The etiology of osteonecrosis is believed to be multifactorial and associated in some cases with both a genetic predilection and exposure to certain risk factors [2]. A definitive etiologic role has been established for some of these factors, based upon longitudinal cohort studies or meta-analyses, but not for the majority, which are considered associated risk factors. Use of glucocorticoids and excessive alcohol intake are associated with more than 80 percent of atraumatic cases [3]. Less common risk factors include sickle cell disease, protein C or Protein S deficiency, Gauchers disease, Hyperlipidemia, pancreatitis, hematological malignancies hyperuricemia and hypertriglyceridemia. Irrespective of the underlying cause of Avascular necrosis of femoral head the basic pathophysiology includes vascular interruption by fractures or dislocation, intravascular occlusion from microthrombi or fat embolism, or introsseous extravascular compression [4].

Avascular necrosis can have significant long-term consequences as it predominantly affects people in younger age groups. It predisposes an individual for physical disability [5]. The social and economic cost associated with avascular necrosis of the femoral head can be significant for an individual [6]. Though, various treatment options have been tried in the past and few therapies are at current research stage (eg – Stem cell transplant), it is pertinent to state that definitive treatment of avascular necrosis of the femoral head is Total Hip Replacement as evidenced by empirical studies till date [7]. However, outcome of THR has been debated, much more in the past as studies had indicated higher need of revision surgeries [8]. However, with the advancement of technology, process and the inputs (be it a skill set of surgeon or implant), there seems to be more light than dark at the end of tunnel. In a developing country like India, it is difficult to estimate the prevalence of avascular necrosis of the femoral head [9]. More difficult aspect is to assess the burden on our health resources. As India has mandated itself for-Health for all‖ by 2020 under guidance of WHO, it is important that potentially treatable, without which equally crippling Avascular necrosis of the femoral head be studied scientifically in Indian context, within the constraints of limited resources of our country [10].

In this background, present study, intends to carry out original research in a tertiary care hospital in southern India, by analyzing clinical and functional outcome in cases of avascular necrosis of femoral head treated surgically with Total Hip Replacement.

Materials and Methods

This was a Prospective, Observational, longitudinal study in which Patients admitted in Orthopaedic ward of a tertiary care hospital with clinical and radiological diagnosis of avascular necrosis of head of femur were included. With Appropriate statistical methods we determined the minimum sample size to be 30 cases. Patients with complaints of pain in walking and pain localized to groin area were examined further for limited and painful Passive range of motion of the hip, especially forced internal rotation, limitation of passive abduction, pain during straight-leg raise against resistance, pain during Passive internal and external rotation of the extended leg (log roll test). X ray - anteroposterior and frog-leg lateral views of both hips was taken. Earliest radiographic findings include femoral head lucency. Diagnosis was confirmed by MRI imaging of the affected hip. A detailed history was taken. Special attention was paid to the possibility of steroid and alcohol intake. All patients selected for the study underwent clinical examination, relevant blood test, imaging followed by surgical intervention through total hip replacement. Patients were classified in to Ficat and Arlet staging. Patients were prescribed NSAID and given physiotherapy. Further, patients who satisfied inclusion and exclusion criteria were enrolled for the study after obtaining informed consent from them. Appropriate pre-operative evaluation was done in all the cases. Senior orthopedic surgeon with experience of more than 15 years operated the cases using posterior approach. Ultra high molecular weight polyethylene acetabular cup and metal alloy femoral component was used. When required PMMA cement was used according to preference of operating surgeon.

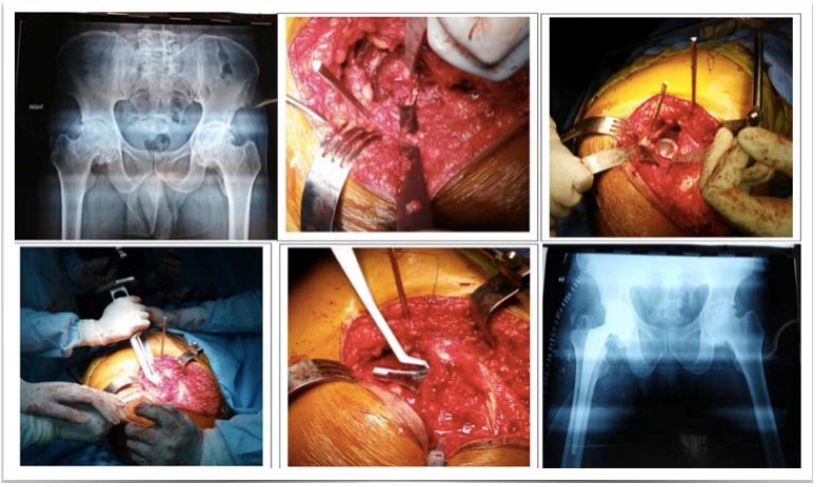

Fig 1: Image showing (Clockwise from Left Upper corner) preoperative X-Ray, Surgical procedure consisting of exposure of acetabulum, Acetabular component positioned in situ, Femoral preparation, Femoral component positioned in situ and immediate post-operative X-Ray

All intra operative events were documented in proforma. After the surgery, patient was monitored in post-operative ward and then shifted to ward next day. Patient was put on NSAID and intravenous fluids. Post-operative recovery was noted in our proforma. Patients were followed every day till the discharge. Patients were discharged after they were mobilized with assistance of physiotherapist. Functional and clinical outcome was measured at 6, 12, 24 weeks post operatively according to Harris hip score. The deformity and ROM were measured with goniometer. Clinical and functional outcome was measured according to Harris hip score. In post-operative follow up interval of 6, 12, 24 weeks, patients were assessed for each component of pain, function and activities (Harris Hip Score). Those who could not come for follow up; history about pain, function and activities was taken over telephone. Information collected were entered in proforma. Data from proforma was analyzed with assistance of statistician though various statistical tests. Based on analysis of our study, discussion was written compared with previous studies and conclusions were arrived.

In the statistical analysis of our study, Continuous variables were presented as mean for parametric data and median if the data is non parametric or skewed. Student t test was applied for calculation of statistical significance whenever the data followed normative distribution. Mann Whitney test was applied whenever data followed non normative distribution. Categorical variables were expressed as frequencies and percentages. Nominal categorical data between the groups was compared using Chi-square test or Fisher's exact test as appropriate. $P<0.05$ was taken to indicate a statistically significant difference. Minitab version 17 was used for computation of statistics.

Inclusion criteria

1. Patients with diagnosis of avascular necrosis of femoral head and having Ficat and Arlet staging of 3 or 4
2. Patients in the age group of 18 to 70 years.
3. Patients willing to give informed consent.

Exclusion criteria

1. Patients with systemic and local infections
2. Patients with diagnosis of avascular necrosis of femoral head and having Ficat and Arlet staging of 1 or 2.
3. Patients who are not medically fit for surgery

Results

Out of the 30 patients diagnosed with Avascular Necrosis of femoral head there were 23 (76.7%) males and 7 (23.3%) females with a M: F ratio of 1: 0.30.

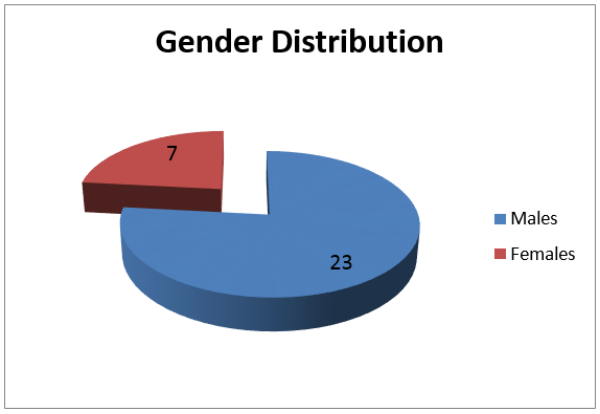

Fig 1: Gender Distribution of the studied cases

The analysis of the age groups of the patients revealed there were 13 (43.33%) patients in age group between 21 – 40 years, 10 (33.33%) patients in age group between 41 – 60 years, 7 (23.33%) patients in age group between 61 – 80 years. Mean age of the study group was 37.63±16.32.

Table 1: Age distribution of the studied cases

Age groups	No. of Patients	Percentage
21 - 40 years	13	43.33%
41 - 60 years	10	33.33%
61 – 80 years	7	23.33%
Grand Total	30	100%
Mean Age±SD = 37.63±16.32 years		

The analysis of body mass index revealed that there were 3 patients with BMI < 18.5, 6 patients with BMI of 18.50 - 24.99, 11 patients with BMI 25.00 - 29.99, 6 patients with BMI 30.00 - 34.99 and 4 patients with BMI ≥40.00.

Table 2: Body Mass Index of the studied cases

Age groups	No. of Patients	Percentage
< 18.5	3	10.00%
18.50 - 24.99	6	20.00%
25.00 - 29.99	11	36.67%
30.00 - 34.99	6	20.00%
≥40.00	4	13.33%
Grand Total	30	100.00%

In this study, there were 5 (16.67%) patients who were hypertensive and 6 (20%) patients who were Diabetic.

Table 3: Associated Medical Conditions in studied cases

Comorbidities	No. of Patients	Percentage. of Patients
No. of Patients with Hypertension	5	16.67%
No.of Patients with Diabetes Mellitus	6	20.00%

It was found that there were 5 patients (16.67%) who had history of significant Alcohol Intake and 4 patients (13.33%) had history of smoking. there were 2 (6.67%) patients who were on steroids. There was 1 (3.33%) patient who had H/O Traum and 1(3.33%) patient was pregnant.

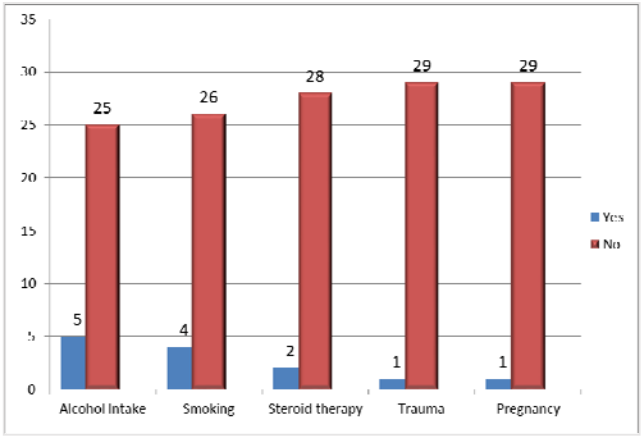

Fig 2: Risk factors of Avascular necrosis of femoral Head

In our study, 27 (90%) patients had pain while walking. 27(90%) of patients had difficulty while walking. 2 (6.67%) patients had bilateral involvement and 17 (56.67%) had right side involvement And 11 (36.67%) had left sided involvement.

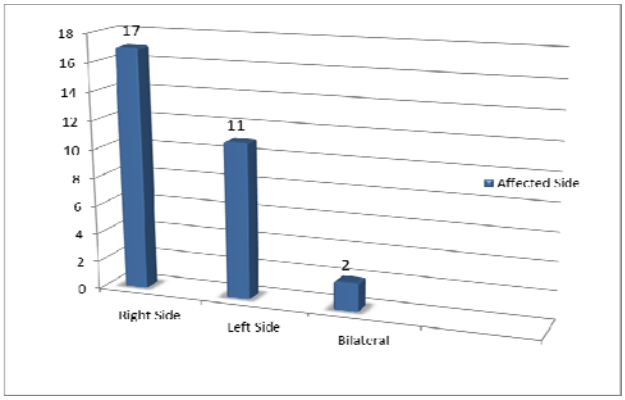

Fig 3: Affected side in the studied cases

In our study, there was 1 patient who had symptoms for < 4 months, 5 patients who had symptoms 4–8 months, 13 patients who had symptoms for 8–12 months and 11 patients who had symptoms for 12–16 months.

Table 4: Duration of symptoms in studied cases

Groups	No. of Patients	Percentage
< 4 months	3.33%	1
4 – 8 months	16.67%	5
8 – 12 months	36.67%	13
12 – 16 months	43.33%	11

In our study, 2 (6.67%) patients had cemented Total hip arthroplasty and 28 (93.33%) had uncemented Total hip arthroplasty.

Table 5: Cemented and uncemented total hip arthroplasty.

Cemented/Uncemented	No. of patients	Percentage
Cemented	2	6.67%
Uncemented	28	93.33%
Total	30	100.0

In our study, pain score pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 15.33±5.07, 36.73±5.34, 39.47±4.1, 42.93±1.8 respectively. There was statistically significant difference found for pain scores at Pre-Operative and Post-Operative 24 weeks.

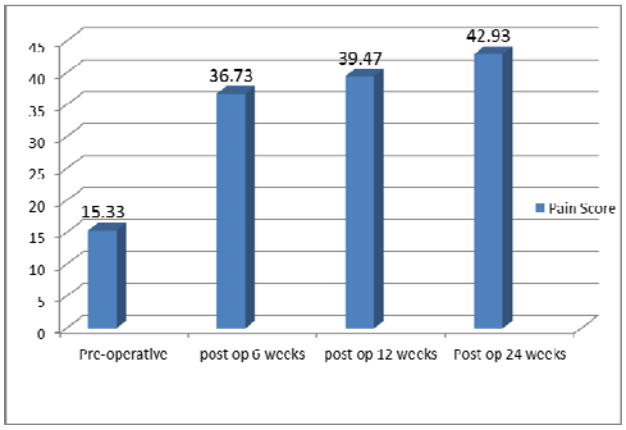

Fig 4: Pain scores in the studied cases

In our study, mean score for Limp pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 6.50±1.52, 9.9±1.47, 10.10±1.4, 10.6±1.04 respectively. Mean score for support pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 5.33±1.77, 9.53±1.96, 10.07±1.72, 10.73±1.01 respectively. Mean score for Distance walked pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 4±2.13, 10 ±1.44, 10.3±1.29, 10.8±0.76 respectively. Mann Whitney test was applied and p value was determined. There was statistically significant difference found for scores for limp, support and distance walked at Pre-Operative and Post-Operative 24 weeks.

Table 6: Comparison of Function (Gait) in studied cases.

Variable	Limp	Support	Distance walked
Pre-Operative	6.50±1.52	5.33±1.77	4±2.13
Post-Operative 6 weeks	9.9 ±1.47	9.53 ±1.96	10 ±1.44
Post-Operative 12 weeks	10.10±1.4	10.07±1.72	10.3±1.29
Post-Operative 24 weeks	10.6±1.04	10.73±1.01	10.8±0.76
P Value	0.00	0.00	0.00

In our study, mean score for stair climbing at pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 1.53±0.51, 2.73±0.98, 3.33±0.96, and 3.53±0.86 respectively. Mean score for wearing socks at pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 1.07±1.01, 2.80±1, 3.80±0.61, 4.00±0.0 respectively. Mean score for able to sit at pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 1.30±1.51, 3.80±1, 4.07±1.01, 4.20±1 respectively. Mean score for able to sit at pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 0.00, 0.47±0.51, 0.73±0.45, 0.9±0.31 respectively. Mann Whitney test was applied and p value was determined. There was statistically significant difference found for climbing stairs, wearing socks and distance walked Pre-Operative and Post-Operative 24 weeks.

Table 7: Comparison of Function (activities) in studied cases.

Variable	Stairs	Socks	Sitting	Public Transportation
Pre-Operative	1.53±0.51	1.07± 1.01	1.30± 1.51	0.00
Post-Operative 6 weeks	2.73± 0.98	2.80±1	3.80±1	0.47±0.51
Post-Operative 12 weeks	3.33± 0.96	3.80±0.61	4.07±1.01	0.73±0.45
Post-Operative 24 weeks	3.53± 0.86	4.00±0.0	4.20±1	0.9±0.31
P Value	0.00	0.00	0.00	0.00

In our study, mean score for absence of deformity pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 3.83±0.38, 3.87±0.35, 3.93±0.25, and 3.97±0.18. Mean score for Range of motion pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 3.27±1.01, 3.50±0.68, 4.00±0.79, 4.7±0.47. Mann Whitney test was applied and p value was determined. There was statistically significant difference found for score of range of motion preoperatively versus post operatively at 24 weeks.

Table 8: Comparison of Absence of Deformity and Range of motion

Variable	Mean Score for Absence of Deformity	Mean Score for Range of motion
Pre-Operative	3.83± 0.38	3.27± 1.01
Post-Operative 6 weeks	3.87±0.35	3.50±0.68
Post-Operative 12 weeks	3.93±0.25	4.00±0.79
Post-Operative 24 weeks	3.97± 0.18	4.7± 0.47
P Value	0.073	0.00

In our study, mean Total Harris hip score pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post-Operative 24 weeks was 42.27±9.9, 83.40±7.57, 89.83±5.23, 96.37±3.65 respectively. Mann Whitney test was applied and p value was determined. There was statistically significant difference found for Total Harris hip score preoperatively versus post operatively at 24 weeks.

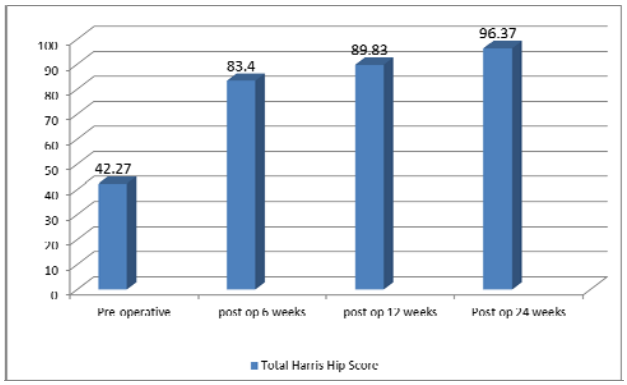

Fig 5: Comparison of Pre-operative and Post-operative Total Harris hip score

In our study, 28 (93.33%) patients had excellent results and 2 (6.67%) patients had good outcome following Total Hip Replacements after avascular necrosis of femoral head.

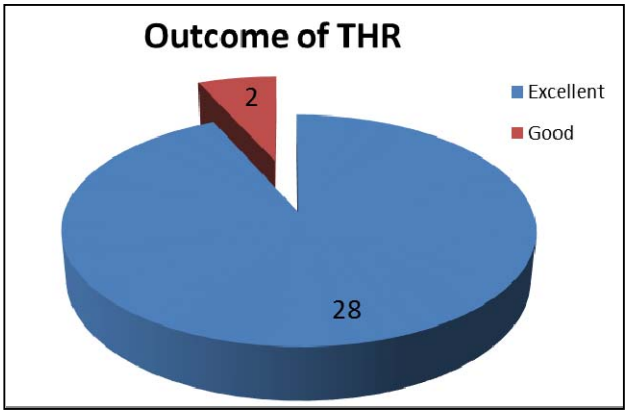

Fig 6: Rating of outcome of THR in patients studied**.**

In our study, 27 (90%) patients had no complications while 2 (6.7%) had limb length discrepancy and 1 (3.33%) patient had anterior thigh pain. There was no loosening of implant.

Table 9: Complications of THR in Avascular necrosis of femoral head

Complications	No. of patients	Percentage
No complications	27	90%
Limb length discrepancy	2	6.67%
Anterior Thigh Pain	1	3.33%
Loosening of Implant	0	0%
Total	30	100.0%

Discussion

Present study was conducted at a tertiary care hospital situated in a metropolitan city over a period of 15 months. There were 7 females and 23 males. In our study, the minimum age was 22 years and the maximum age was 69 years. Highest numbers of patients were between 21-40 years (43.33%)). Mean age in the study group was 37.63±16.32.

In the study by Kakaria *et al*, there were 20 patients and out of which there were 16 males and 4 females. The overall male to female ratio was 4:1. Majority of patients were between 31-40 years (45%) and 41-50 years (25%), which had similar distribution of age groups like our study [11]. This similarity is because avascular necrosis is disease of younger age groups and additional risk factors like alcohol and trauma occurs more frequently in this age group.

In our study, out of 7 females, 1 patient developed avascular necrosis of femoral head following pregnancy. She had bilateral involvement of hip. In study by Kakaria *et al*, out of the four female cases, two patients developed avascular necrosis of femoral head following pregnancy and both had bilateral hip involvement. In later study, reported higher incidence of pregnancy related avascular necrosis of femoral head than our study. This may be because wide variation in confounding factors present in study groups [11].

In our study, 28 (93.34%) patients had unilateral involvement and 2 (6.67%) patients had bilateral involvement of hip. Out of 2 cases of bilateral hip involvement, 1 was having pregnancy as risk factor. Thus our study showed 50% of patients who had bilateral involvement had pregnancy as risk factor. When compared, study by Kakaria *et al* found 50% of patients with bilateral involvement had pregnancy as risk factor and study by Montella *et al* found 30.77% of patients with bilateral involvement had pregnancy as risk factor [12].

In a study by Jacobs *et al*, Bilateral hip necrosis was present in 44.5% of patients who were regularly consuming alcohol (80). In our study, there were 4 (13.33%) subjects with H/o of alcohol intake and 3 (10%) subjects with H/O Smoking [13].

In study by Kakaria *et al*, of the 20 cases of AVN of head of the femur, there were 7 cases where there was history of chronic alcohol intake. The exact mechanism of how alcohol causes AVN is not absolutely understood, but various studies have stated that excessive fatty substances are produced and

build up in the very small blood vessels of the bone. Blockage then occurs which decreases blood flow to the femoral head causing bone death [11].

In a study by Jacobs *et al*, on 164 patients with alcoholism-induced osteonecrosis who were seen over a 22-year period, the average duration of alcohol abuse was 9.5 years, ranging from 8 to 20 years. Hyperlipidemia was found in 38.4% of cases, involving both cholesterol and triglycerides. Serum amylase was elevated in 33 patients; liver dysfunction was present in 50; hepatomegaly was found in 32; and biopsy-confirmed cirrhosis was present in 22 cases. This study supported the hypothesis that alcoholism-induced bone necrosis is caused by fat embolism linked to co- existent hyperlipidemia [13].

In our study, there were 2 (6.67%) subjects who had H/o steroids use. Both patients were using steroids for Asthma. Similarly, in a study by Kakaria *et al*, one patient was on steroids for a long time for the treatment of bronchial asthma [11].

In a systemic review of literature by Wu *et al* regarding steroid use and avascular necrosis of femoral head, they found fat hypertrophy, intravascular coagulation and fat emboli as important risk factors of steroid-induced ischemic bone necrosis which may develop during the initial one year after commencing the use of steroids. They concluded pathology of osteonecrosis can be best studied by MRI, particularly for its staging. Review opined cautious strategies such as low dose, oral route, short duration of steroid usage, use of steroid sparing agent, and alcohol avoidance should be followed as a traditional therapy [14].

In our study, 1 (6.67%) subject had trauma. In study by Kakaria *et al*, 2 (20%) patients had trauma. Trauma causes disruption of blood supply and poses a risk of avascular necrosis of hip. However, actual pathology involved is more complex. In several studies, relation between trauma and AVN was not consistent. In many cases reports, there were other risk factors along with trauma. And there is always difficulty in grading the intensity of the trauma which might have occurred years ago. Hence it is difficult to assign trauma as causative factor for AVN [11].

In our study, pain score pre operatively, Post-Operative 6 weeks, Post-Operative 12 weeks, Post- Operative 24 weeks was 15.33±5.07, 36.73±5.34, 39.47±4.1, 42.93±1.8 respectively. Thus pain score improved significantly by 24 weeks. Similarly, Function, Gait and function Activities increased significantly post operatively at 24 weeks. Overall, total Harris hip score improved significantly from 42.27± 9.9 pre operatively to 96.37±3.65 post operatively at 24 weeks.

In a study by Zangger *et al*, where they studied retrospectively 19 patients with AVN with SLE and control group of 19 patients who had AVN with other etiologies, mean Harris hip score post operatively was 86.7 in SLE patients and 81.9 in controls. Less favorable clinical outcomes of hip replacement have been reported in young patients who have AVN of other etiology (e.g., alcoholic, post-traumatic), but this was not the case in our young patients who had AVN and SLE [15].

Schneider *et al* wanted to study risk of loosening that has been previously reported in replacements performed because of avascular necrosis. They studied clinical and radiological outcome of 129 cementless total hip prostheses retrospectively of which 22 cases had AVN. The Harris Hip Scores were 87 for the AVN subgroup and 92 for other diagnoses. The results of their study showed that AVN is not a risk in total hip replacement [16].

Siwach *et al* studied 100 cases operated with total hip arthroplasty using modular prosthesis in patients in age group 35 to 70 years with a variety of causes. With a mean follow up of 6.02 years they found at the last follow-up mean Harris Hip score was 83.5. The authors concluded that clinical results were excellent and there was no difference with respect to etiologies for THR [17].

Thus, our study result correlated well with the results previous studies in terms of overall outcome and on individual component score. Most of the patients got relieved of pain by 12 – 24 weeks and had significant improvement in gait and activities and were back to their work and routine after 6 months. This observation was supported in most of previous studies.

In our study, one patient had anterior thigh pain, which required prolonged course of anti inflammatory drugs. Patient also required physiotherapy for the pain management, which was evaluated and managed conservatively with NSAID. Two patients had limb length discrepancy which was again managed conservatively.

In our study, there was no significant difference in outcome of THR with respect to underlying etiologies. However, spectrum of etiologies in our study was also small. Hence generalization will be difficult. In study by Kakaria *et al*, one patient had delayed wound healing. There was past history of alcoholism and steroid intake for bronchial asthma in that patient [11].

Dudkiewicz *et al* studied 68 patients with mean age of 49.9 years underwent 84 total hip arthroplasties due to AVN. The mean preoperative HHS was 28.5±4.5 as opposed to a postoperative HHS of 86±10. The revision rate was 16.7%. The study found etiology did not affect the final outcome, but less favorable long-term results were found in the steroid-induced AVN patients [18].

In our study, there was no difference in age group and gender composition of groups who underwent Uncemented (n=28) and cemented THR (n=2).When outcome in terms of Harris hip score was measured, there was no statistically significant difference between the groups for any components at 6 weeks (p value – 0.52), 12 weeks (p value – 0.25) and 24 weeks (p value – 0.18). 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. Study concluded predictable outcome with the use of cementless implants [19].

In study by Kim *et al* also reported the results of contemporary THA with and without cement in patients with ON at a mean follow-up of 17 years. In this series, 50 patients (100 hips) had simultaneous bilateral arthroplasties with a cemented stem in one hip and a cementless stem in the contralateral hip. Forty-eight patients (48 hips) had unilateral THA with a cementless stem. All patients had cementless acetabular components. The study found that there was no difference in the HHS scores between hybrid and fully cementless prosthesis. At the latest follow-up, 83% of 48 acetabular components in the hybrid group and 85% of 94 acetabular components in the fully cementless group were intact; 98% of the femoral components in both groups were also intact [20].

Thus, our study matches with various studies as outcome cemented versus uncemented THR remains similar. There remain merits and demerits with both modalities. Hence there is need for further evidence based studies.

Conclusion

Total hip replacement was found to have excellent functional outcome in terms of total Harris hip score, pain scores, range of motion, gait and daily activities like climbing stairs and distance walked. We recommend total hip replacement as surgical modality of treatment for stage 3 and 4 (Ficat and Arlet staging) avascular necrosis of femoral head.

Conflict Of Interest: None

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