

# Retrospective Outcome Study of Total Hip Arthroplasty (Minimum 5 Year Follow Up)

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**Abstract:** *The aim of this study is to access in clinical and radiological outcome of uncemented total hip replacement with minimum 5 year of follow up. Uncemented total hip replacement is gold standard for management of hip arthritis. However long term reassessment is required to see consequences of uncemented total hip replacement. All the details were collected from record section of hospital. This is a retrospective study of total hip replacement midterm (mean follow up of 5-8 years) follow up. A total of 48 patient were operated before January 2012. This procedure is more common in Male>Female. Majority of patient were between 40 to 60 year (mean age is 55 year) Most common indication is osteonecrosis of femoral head. Other being post traumatic, infection, idiopathic. A patient was operated with modified Gibson approach (posterolateral). 20 % of patient were having post surgical complication (infection, loosening, DVT, dislocation). About 90 % of patient having no pain, 7 % having slight pain, 2 % having moderate pain. Majority because of displacement of stem in varus and loosening, Moat of patient were ambulatory expect. Your 3 patient who walked with walker and 2 patient who walked with stick. 8 % of patient is having lower limb shortening, 4 % patient having lower limb lengthening, on imagine none of patient show loosening or sinking of implant this suggest uncemented total hip replacement is sound prosthesis in our study comparing the following procedure of fracture limb, ROM daily activity were examined with modified Harris Hip score. The Harris hip score give maximum of 100. A score 90-100 is an excellent result-36 patient. 80-90 is good – 6 patient. 70-80 is considered fair -5 patient. <70 is considered poor- 1 patient. Overall revisional score is very low. Mostly due to psychiatric disorder, old age, combined illness, hence it suggest that uncemented total hip replacement is sound moderate to treat patient with advanced hip arthritis in your patient.*

**Keywords:** Total Hip Replacement THA AVN ROM

## 1. Introduction

The hip joint is the most important joint of the body as it enables a person to assume various postures. Diseases of this joint are always alarming because if untreated, produces serious disability, for this reason various methods of management of hip diseases have been devised, but failure of conventional management in advanced stages of hip diseases like AVN, osteoarthritis, rheumatoid arthritis, congenital subluxation or dislocation, bone tumor etc. have brought a new surgical era of Total Hip Replacement (THR)

## 2. Aims and Objectives

**To study “5 year follow up of THA patients” in terms of:**

- Pain relief
- Range of motion of knee
- Functional improvements- To measure the functional outcomes
- Complications - To evaluate short term as well as long term complications rate
- Patient satisfaction

**To evaluate the effects of certain factors on outcome of surgery:**

- Age
- Sex
- Comorbid illness
- Indication for surgery
- Symptom duration
- Complications
- Comparison of disease with the range of motion and complications

## 3. Material and Methodology

This retrospective study of cases operated in 5 years for total hip replacement for various pathology of Hip joint at the Orthopaedic Department, GG Hospital, Jamnagar. Cases were assessed with respect to postoperative results of short and long term follow up. All patients were operated through standard modified gibsons approach in THA.

### Inclusion Criteria for the Study

- Males and females both
- >40years
- Implants (all the varieties that were available for follow up)
- Patients with rheumatoid arthritis included
- Patients on conservative treatment before
- Patients with bilateral involvement and underwent bilateral THA
- Patients with pre-existing fracture around the hip
- Patients with post traumatic osteoarthritis

### Exclusion Criteria from the Study

- Patients who are reactive to HIV, HbsAg
- Patients with revision THA
- Patients with post infective arthritis
- Patients <40 years

## 4. Results

Patients were assessed on the basis of

- Need for support of walking
- gait
- Movement at knee joint
- Incidence of complications

Results in terms of Function Scoring System

	Points	Recent
<b>1. FUNCTION:</b>		
•Walking	50	
•Unlimited	40	
•>10 blocks	30	
•5-10 blocks	20	
•<5 blocks	10	
•Housebound	0	
•Unable Stairs		
•Normal up &down	50	
•Normal up; down with rail	40	
•Up & down with rail	30	
•Up with rail; unable to down	15	
•Unable	0	
<b>Subtotal</b>		
<b>2. Deductions (Minus):</b>		
•Cane	5	
• Two canes	10	
• Crutches or walker	20	
Total Deductions :		
Function Score :		

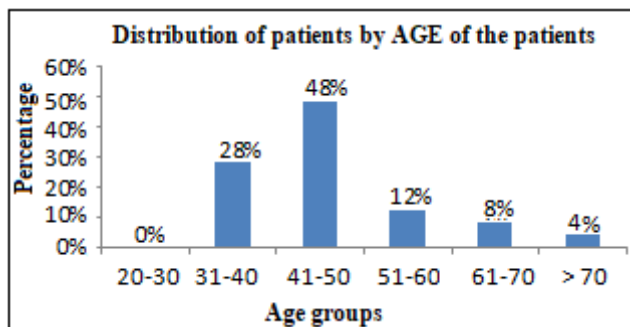
Results in terms of Hip Scoring System

	Points	Recent
<b>1. PAIN:</b>		
•None	50	
•Mild or occasional	45	
•Stairs only	40	
• Walking &stairs	30	
• Moderate	20	
• Occasional	10	
• Continual	0	
• Severe		
<b>2. RANGE OF MOTION:</b>		
5 Degrees=1 point Degree Point	25	
<b>3. STABILITY: (maximum movement in any position)</b>		
• Anteroposterior		
• <5 mm	10	
• 5- 10 mm	5	
• >10 mm	0	
• Mediolateral		
• <5 degree	15	
• 6- 9 degree	10	
• 10- 14 degree	5	
• 15 degree	0	
<b>SUBTOTAL :</b>		
<b>4. DEDUCTIONS (MINUS):</b>		
•Flexion contracture		
•5-10 degree	2	
•10-15 degree	5	
•16-20 degree	10	
•>20 degree	15	
•Extension lag		
•<10 degree	5	
•10-20 degree	10	
•>20 degree	15	
•Alignment		
•5-10 degree	0	
•0-4 degree	3/degree	
• 11-15degree	3/degree	
• Other	20	
<b>TOTAL DEDUCTION :</b>		
<b>KNEE SCORE</b>		
(if total is a minus number, score is 0)		

5. Observation

Table 1

Age group	No of cases of THR	Percent
20-30	0	0%
31-40	07	28%
41-50	12	48%
51-60	03	12%
61-70	02	8%
> 70	01	4%
Total	25	100%

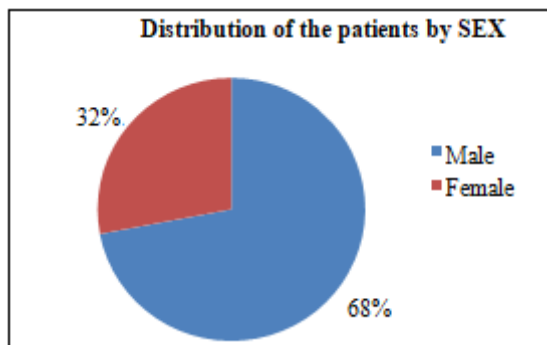


The average age incidence in my study is 3-4-5th decades.

In this series most of the patients are in younger age group because in India life span of the patient is less and Osteonecrosis is more common in younger age group.

Table 2: Distribution of the patients by SEX

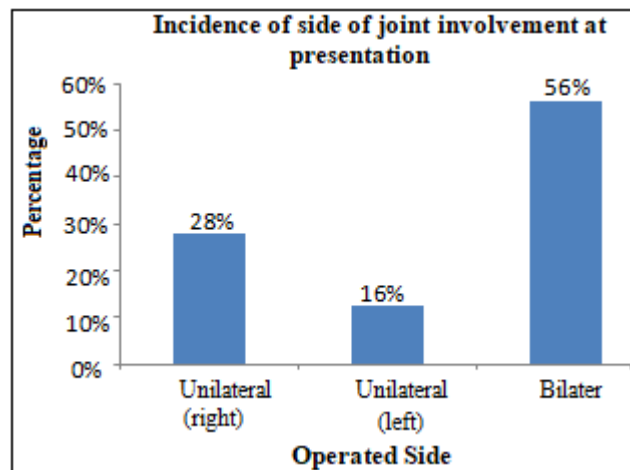
Sex	No of cases of THR	Percent
Male	13	68%
Female	06	32%
Total	19	100%



Males are the earning member in the society and Osteonecrosis is more common in males due to post traumatic complication. So in my study male patients are more than females

Table 3: Incidence of side of joint involvement at presentation

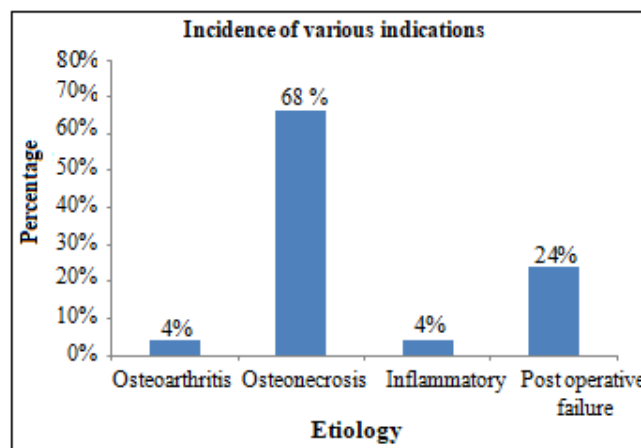
Operated side	No of cases of THR	Percent
Unilateral (right)	07	28%
Unilateral (left)	04	16%
Bilateral	14(7+7=14)	56%
Total	25	100%



In my study 14 patients are operated for bilateral hip, 7 patients are of right side and 4 patients are of left side.

Table 4: Incidence of various indications

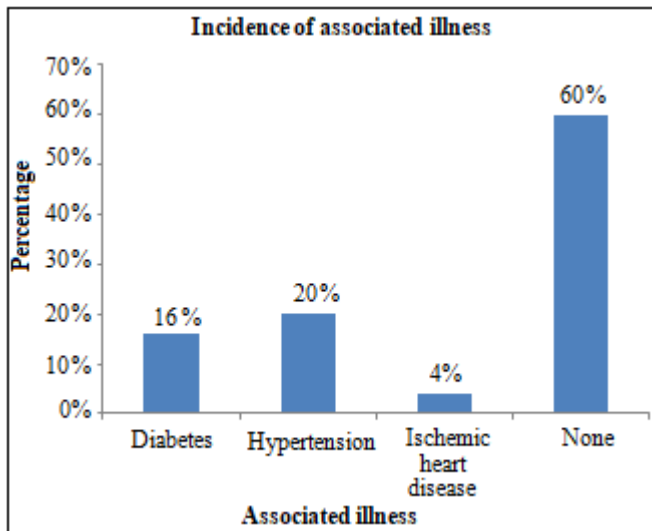
Etiology	No of cases(hip) of THR	Percent
Osteoarthritis	1	4%
Osteonecrosis	17	68%
Inflammatory	1	4%
Post operative failure	6	24%
Total	25	100%



In my study most of the patients 17 hips had Osteonecrosis.6 hips are due to the failure of the primary surgery.1 hips are due to osteoarthritis and 1 hips are of inflammatory pathology.

Table 5: Incidence of associated illness

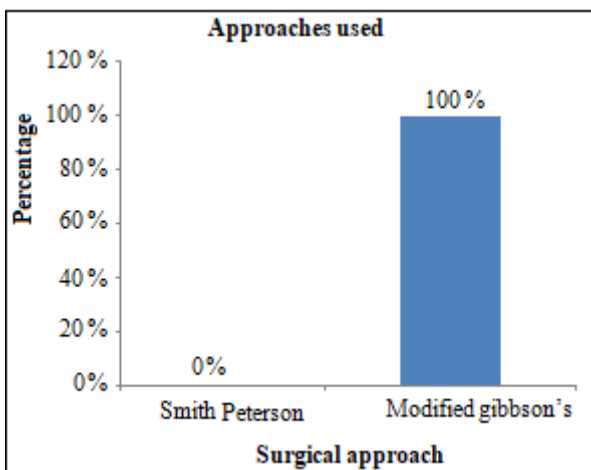
Associated illness	No of cases	Percent
Diabetes	4	16%
Hypertension	5	20%
Ischemic heart disease	1	4%
None	15	60%
Total	25	100%



In my study 5 patients are having hypertension, 4 patients are having diabetes and one patient is having ischemic heart disease. All other patients are having no associated illness.

**Table 6:** Approaches used

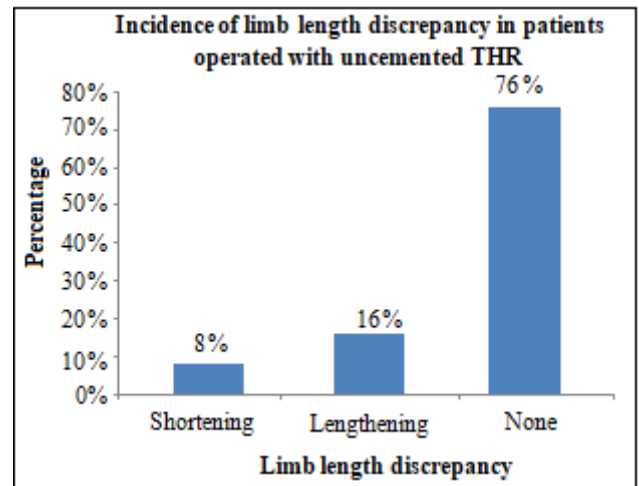
Surgical approach	No of cases	Percent
Smith Peterson	0	0%
Modified gibbson's	25	100%
Total	25	100%



All patients in my study are operated with modified Gibson approach.

**Table 7:** Incidence of limb length discrepancy in patients operated with **uncemented THR**.

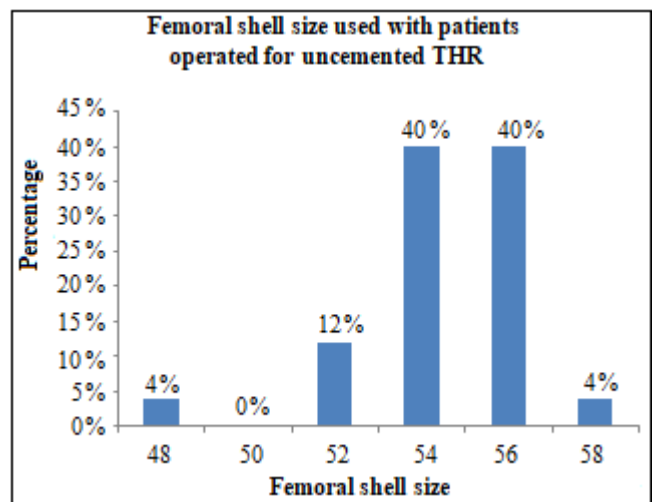
Limb length discrepancy	No of cases(hips)	Percent
Shortening	2	8%
Lengthening	4	16%
None	19	76%
Total	25	100%



In my study 19 hips operated with uncemented THR are having no limb length discrepancy, 4 hips having limb length lengthening and 2 hips having limb length shortening.

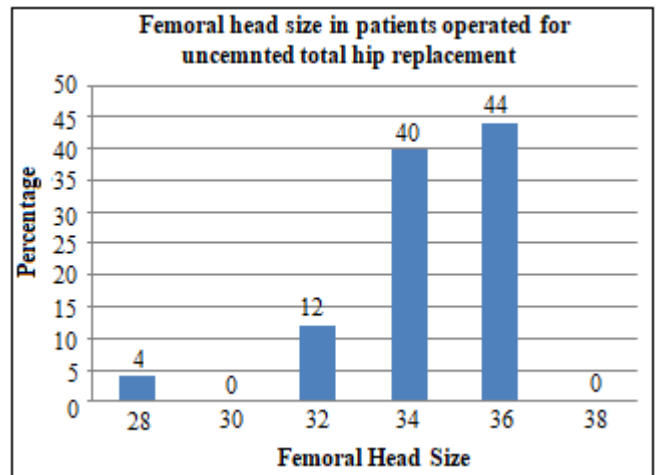
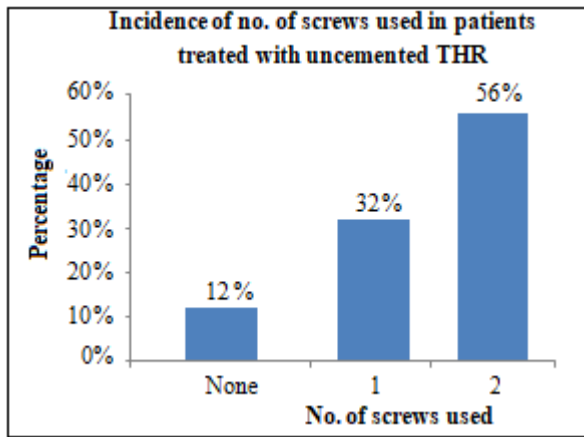
**Table 8:** Femoral shell size used with patients operated for uncemented THR

Femoral shell size	No. Of patients	Percentage
48	1	4%
50	0	0%
52	3	12%
54	10	40%
56	10	40%
58	1	4%
Total	25	100%



**Table 9:** Incidence of no. Of screws used in patients treated with uncemented THR

No. of screws used	No. Of patients	Percentage
None	3	12%
1	8	32%
2	14	56%
Total	25	100%

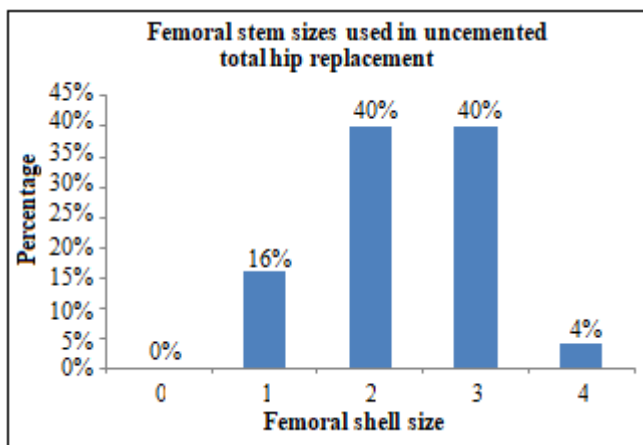


**Table 10:** Femoral stem sizes used in uncemented total hip replacement

Femoral Stem Sizes	No. Of Patients	Percentage
0	0	0%
1	4	16%
2	10	40%
3	10	40%
4	1	4%
Total	25	100%

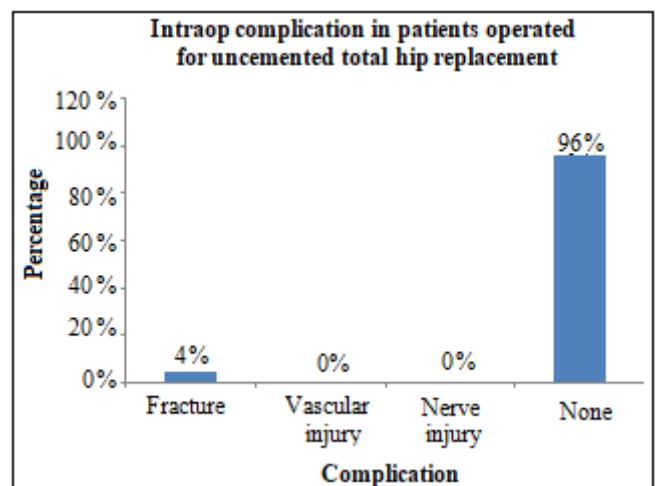
**Table 12:** Intraop complication in patients operated for uncemented total hip replacement

Complication	No. Of patients	Percentage
Fracture	1	4%
Vascular injury	0	0%
Nerve injury	0	0%
None	24	96%
total	25	100%



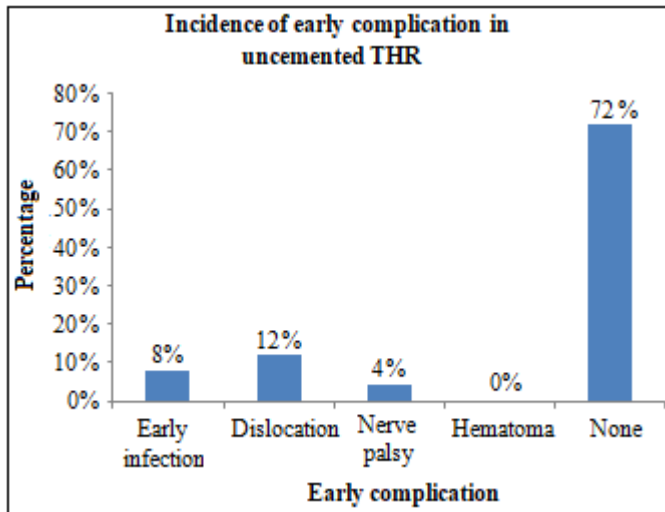
**Table 11:** Femoral head size in patients operated for uncemented total hip replacement

Femoral head size	No. Of patients	Percentage
28	1	4%
30	0	0%
32	3	12%
34	10	40%
36	11	44%
38	0	0%
total	25	100%



**Table 13:** Incidence of early complication in uncemented THR

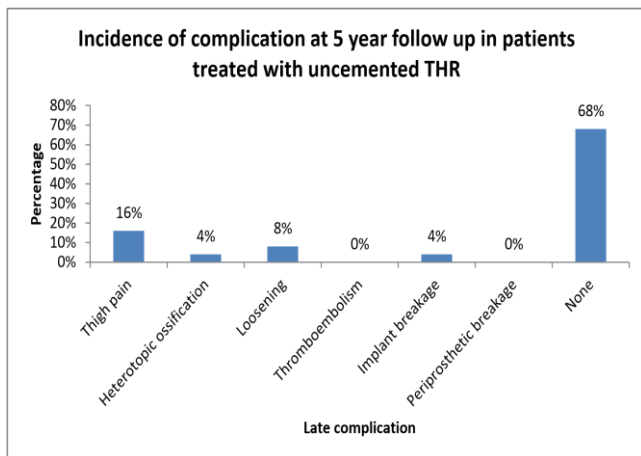
Early complication	No of cases(hips)	Percent
Early infection	2	8%
Dislocation	3	12%
Nerve palsy	1	4%
Hematoma	0	0%
None	19	72%
Total	25	100%



IN my study 2 hips developed Early infection, 3 hips having dislocation, 1 hip was developed nerve palsy which is sciatic and which was completely recovered in within 2 months of post operative period. and 1 hip developed per operative femoral shaft fracture and managed per operatively in form of tension band wiring.

**Table 14:** Incidence of complication at 5 year follow up in patients treated with uncemented THR

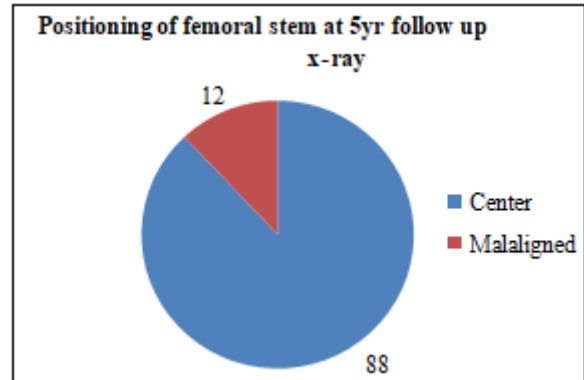
Late complication	No of cases(hip)	Percent
Thigh pain	4	16%
Heterotopic ossification	0	0%
Loosening	2	8%
Thromboembolism	0	0%
Implant breakage	1	4%
Periprosthetic breakage	0	0%
None	18	72%
Total	25	100%



In my study, 4 hips developed anterior thigh pain, 2 hips developed loosening in form of fibrous fixation of femoral or acetabular components and 1 patient developed implant breakage.

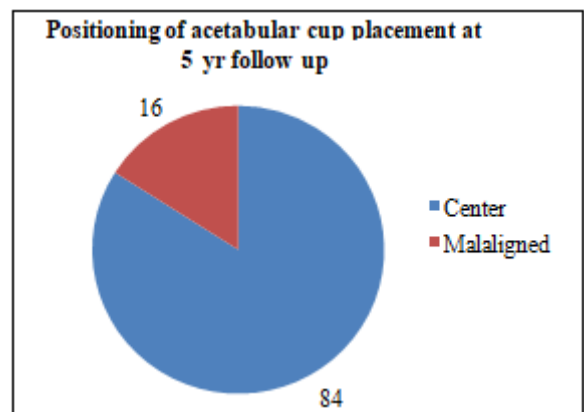
**Table 15:** Positioning of femoral stem at 5yr follow up x-ray

Positioning	No. of patients	Percentage
Center	22	88%
Malaligned	3	12%
Total	25	100%



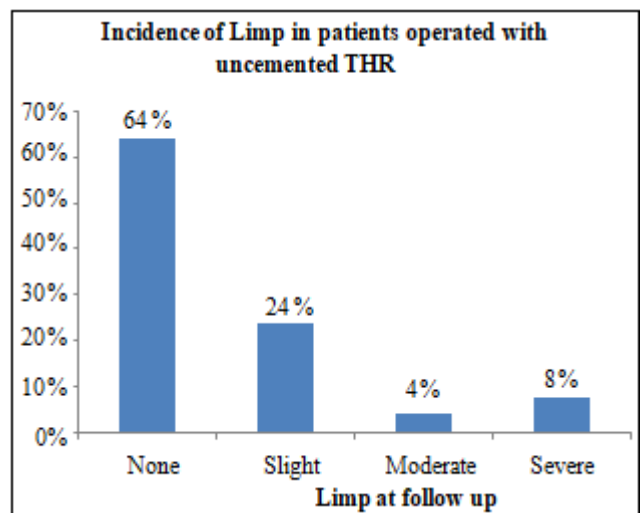
**Table 16:** Positioning of acetabular cup placement at 5 year follow up

Positioning	No. of patients	Percentage
Center	21	84%
Malaligned	4	16%
Total	25	100%



**Table 17:** At 5yr follow up incidence of Limp in patients operated with uncemented THR

Limp at follow up	No of cases	Percent
None	16	64%
Slight	06	24%
Moderate	01	4%
Severe	02	8%
Total	25	100%



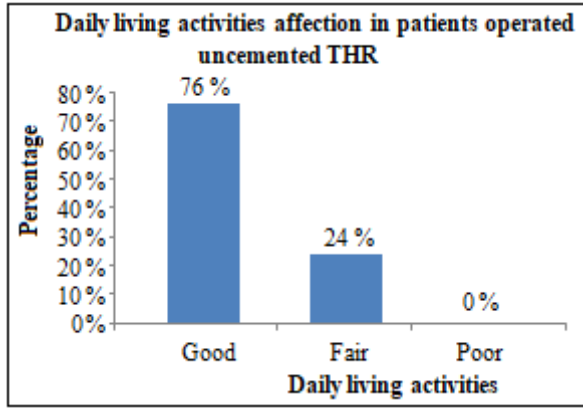
In my study 16 patients are having no limping at 2 years follow up, 06 patients are having slight limping, one patient



is having moderate limping at 2 years follow up and 2 patients is having severe limp at 2 years follow up.

**Table 18:** At 5yr follow up daily living activities affection in patients operated with uncemented THR.

Daily living activities	No of cases(hips)	Percent
Good	19	76%
Fair	6	24%
Poor	0	0%
Total	25	100%

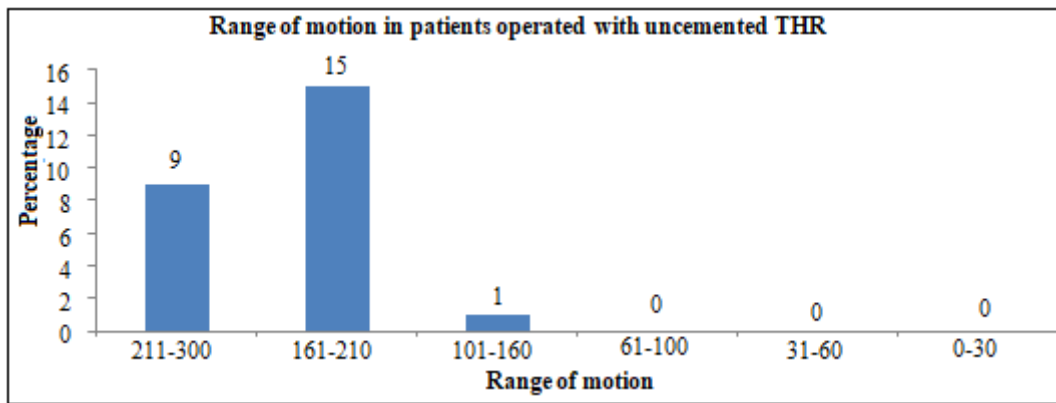


In Daily activities, according to modified Harris hip score, I have included if patient is able to upstairs or downstairs, if patient is able to sit in a chair or not, if patient is able to wear shoes and socks or not and if patient is able to do public transportation or not.

In my study, 19 patients are having good score in daily living activities and only 6 patients are having fair result and none patient is having poor result in daily living activities at two years follow up.

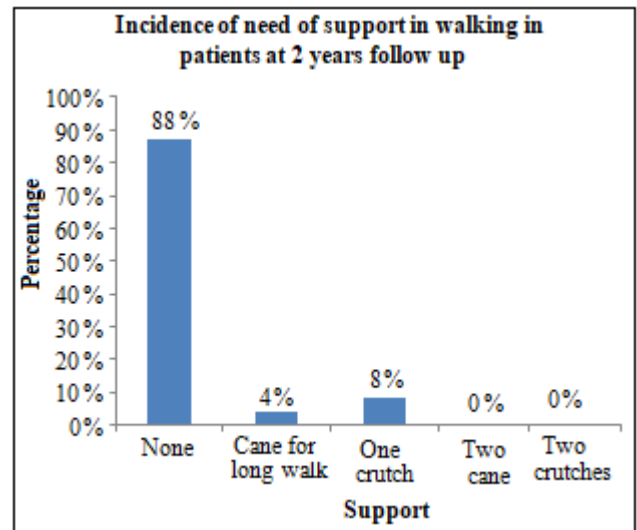
**Table 19:** Harris hip score

Range of motion	Score	No of hips
211-300	5	9
161-210	4	15
101-160	3	1
61-100	2	-
31-60	1	-
0-30	0	-
Total		25



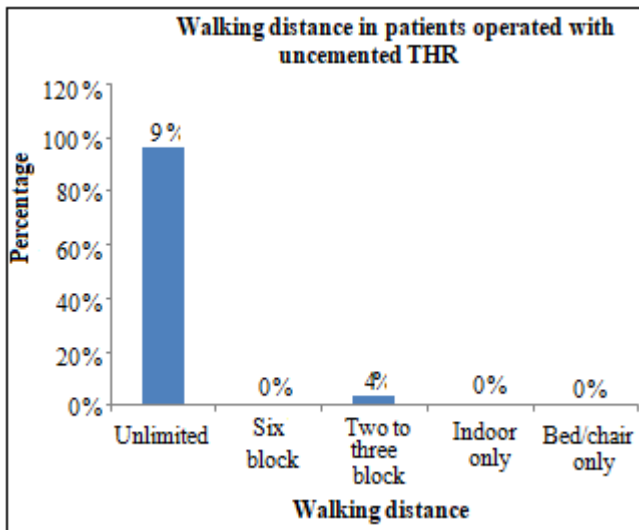
In my study, total 24 hips are having good range of motion according to modified harris hip score and only one hip is having average range of motion.

Support	No of cases(hips)	Percent
None	22	88%
Cane for long walk	1	4%
One crutch	2	8%
Two cane	0	0%
Two crutches	0	0%
Total	25	100%



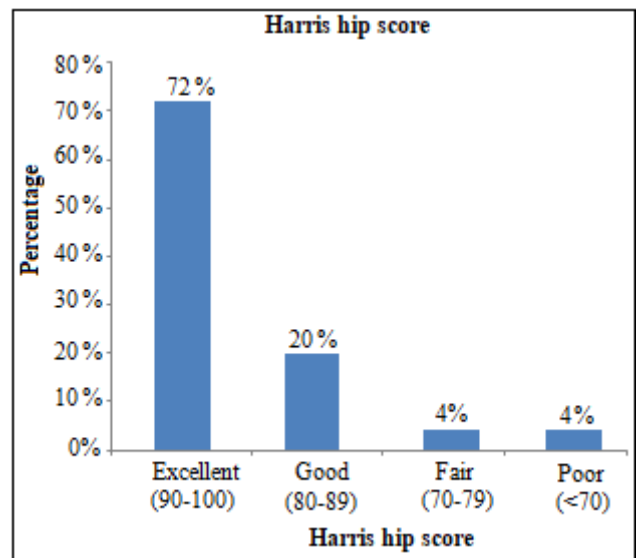
In my study 21 hip have no need of support while walking and only two hips having need of a cane for walking, two need one crutch for walking

Walking distance	No of cases(hips)	Percent
Unlimited	24	96%
Six block	0	0%
Two to three block	1	4%
Indoor only	0	0%
Bed/chair only	0	0%
Total	25	100%



In my study, 24 hips can walk up to unlimited distance without any difficulty and only 1 hips can walk two to three block after that pain is developed and patient need rest after that.

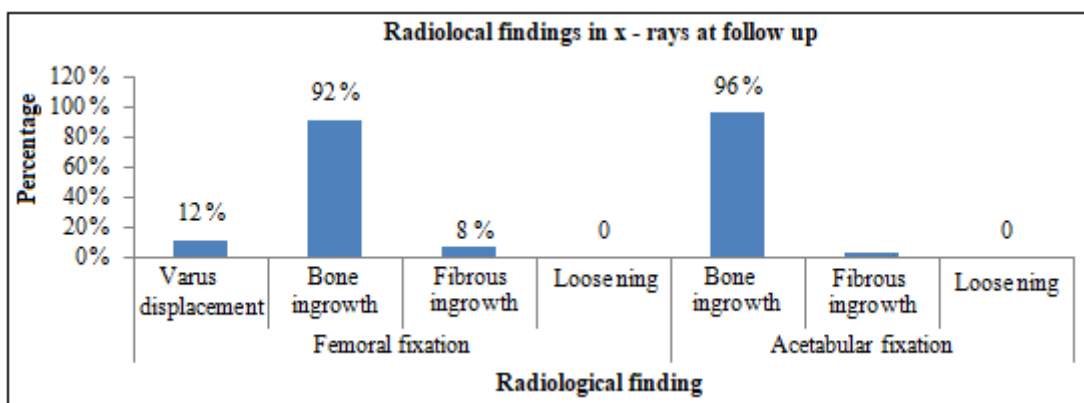
Harris hip score	Score	No of cases	Percent
Excellent	90-100	18	72%
Good	80-89	5	20%
Fair	70-79	1	4%
Poor	<70	1	4%
Total		25	100%



In my study 18 patients are having excellent harris hip score, 5 patients are having good score, one patients is having fair and only one patient is having poor outcome at 2 years follow up. Range of motion scale in patients operated with uncemented THR according to modified harris hip score.

Table 20: At 5yr follow up radiological findings in x-rays

Radiological finding	No of hips	Percentage
<b>Femoral fixation</b>		
1. Varus displacement	3	12%
2. Bone ingrowth	18	72%
3. Fibrous ingrowth	2	8%
4. Loosening	2	8%
<b>Acetabular fixation</b>		
1. Bone ingrowth	20	80%
2. Fibrous ingrowth	1	4%
3. Malaligned	4	16%
<b>Sinking</b>	0	-



In my study, on x-ray radiological examination, in 3 hips femoral Implant is in varus position. 23 hips showing femoral bone ingrowth and 2 hips showing fibrous fixation in femoral component. 24 hips showing acetabular ingrowth and one hip showing fibrous fixation in acetabular component. Among these two hips, one hip is showing both femoral and acetabular fibrous ingrowth. 5 hips showing proximal femoral stress shielding effect at follow up x ray examination. 1 hip is having acetabular floor fracture at the per operative step and for that mesh is implanted. And patient is not having any complain related to this and

patients modified harris hip score is good

## 6. Discussion

The mean age of incidence in our study is 48.36yrs while compared to JY kim, KOREA which was 46.8 and S.Munigangaiah 43.91years which was similar to our study this signifies that most of the patients needing total hip replacement . in our study most patients were included in 30 to 70 yr age group. 48% patients were included in 41 to 50



which is most common osteonecrosis of hip which may be due to trauma, steroid intake, alcohol abuse and smoking

- 1) The distribution of sex in our study is male 68% and female 32% while in JY Kim is male 73% and female 27% which is similar to our study which signifies that total hip replacement are more in male patients as osteonecrosis of hip is more prevalent in males and associated factors such as alcohol and smoking habits are also more prevalent in males.
- 2) The incidence of side of joint involvement in our study unilateral is 44% bilateral involvement is 56% on compared to S. Munigangaiah for unilateral involvement it is 59.3% and bilateral 40.7%. Which signifies that majority of etiological factors such as osteonecrosis of hip, osteoarthritis of hip idiopathic avascular necrosis and inflammatory conditions such as rheumatoid arthritis ankylosing spondylitis and other sero negative arthritis all are more prevalent bilaterally where as cause of unilateral hip involvement is traumatic, Koch's hip, hemoglobinopathy such as sickle cell anemia and celiac disease.
- 3) The etiology of various indication in our study for total hip replacement is osteonecrosis of hip 68%, osteoarthritis 4%, inflammatory 4% and post operative failure is 24% as compared to JY Kim with osteonecrosis 65.8%, osteoarthritis 15.8% and inflammatory is 15% which was similar to our study which signifies that osteonecrosis is major indication for total hip replacement as similar results have been seen in our study and international studies.
- 4) The incidence of associated illness with patients of total hip replacement are hypertension which 20 % in our study that was preliminary managed by oral anti hypertensive medications, the was diabetes which was 16% which is managed by oral and injectable antidiabetic drug and ischemic heart disease which was 4% which was managed accordingly.
- 5) All patients in our study were operated by modified Gibson approach because it has good surgical exposure, as anterior capsule is left intact dislocation rate is reduced and abductor mechanism not disturbed and less chance of abductor lurch which eases post operative rehabilitation only disadvantage to this approach is bleeding and sciatic nerve damage.
- 6) Out of 25 patients in our study 40 % patients femoral shell size of 54mm, 40% patients 56mm, 12% patients 52mm and 4% patients 58mm and femoral head size of 28mm was used in 4% patients, 32mm size in 12% patients, 34mm in 40% patients and 36mm in 44%. The head cup ratio is important measure for post operative dislocation, head size should calibrated by cup size 28 mm head were used in cup less than 50mm, 32 or 34mm head sizes used in cups 50 to 54mm and 36mm head used in cups >50mm this choice protects minus length head in big cup so the jump distance of dislocation increases and chance is dislocation decreases.
- 7) Out of 25 patients in our femoral stem size 1 in 16% patients, 2 in 40% patients, 3 in 40% patients and 4 in 4% patients femoral stem sizes were choosed based on preoperative templating and DORR type of femoral canal according to DOOR femoral bone classification type A- narrow canal with thick cortical walls

(champagne flute canal, type B- moderate cortical walls and type C- wide canal with thin cortical walls (stove pipe canal).

- 8) Out of 25 patients in 12% patients no screws were inserted as acetabular cup was found to be stable or snugly fix, 32 % patients 1 screw was inserted and 56% patients 2 screws were inserted. The posterior superior quadrant is safest and screw longer than 25mm frequently can be placed through strong bone in this area.
- 9) Out of 25 patients 1 patient had intraoperative fracture of femoral shaft during stem insertion because canal was too narrow (DOOR type A) which was managed by periimplanted plated and cable.
- 10) Among 25 patients 8 % patients had early infection which was probably due several reasons such as patients nutrition, health and ot set up errors to which was managed by I.V antibiotic and dressing, which is comparable to Moczyński early infection is 9.7 %, 12 % had dislocation out of which 1 patient managed by close reduction and immobilization for one month and 2 patients were managed by revision surgery to correct combine version, which is contrary to observation Moczyński which is 1% and 1 patients suffer from sciatic nerve palsy.
- 11) The incidence of late complication in patients operated for uncemented THR anterior thigh pain 16% which is similar to JY Kim, Korea which is 11.7% which could be due to placement of stem in varus and anterior impingement of stem in femur, 8 % patient had loosening due aseptic osteolysis which was managed by placement of long femoral stem and one patient had implant breakage which was managed by revision total hip replacement.
- 12) At 5 yr follow up outcome of all patients were assessed by radiological and functional.

#### a) Functional outcome

Out of 25 patients 36% had slight limp, 4% has moderate and 8 % has severe limp, moderate limp is due to aseptic osteolysis and severe limp was due to implant breakage in one patient and varus displacement in one patient, slight pain was due to varus displacement of femoral stem in 2 patients, loosening of femoral stem in one patient and 3 patients were due to malaligned implant placement. At 5yr follow up among 25 patients 76% patients had good daily living activity and 24% had fair daily living activity was due malaligned stem, aseptic loosening and implant breakage.

At 5yr follow up 4% patient had range of motion of 101-160 degrees probably due to implant breakage, 60% had range of motion of 161-210 degree and 36% patients had 211-300 degrees of range of motion.

At 5yr follow up 4% patient used cane for walk was due to implant breakage and 8% uses one crutch for walking probably due to loosening and varus displacement.

Among 25 patients in our study 72% had excellent Harris hip score, 20% had good, 4 % had fair and 4% had poor Harris hip score. The mean modified Harris hip score is 94.4 in our study as compared to JY Kim 90% and S. Munigangaiah 93.8% which is also similar which signifies over all out

come total hip replacement is good in all patients treated for the same.

#### b) Radiological outcome

At 5 yr follow up on femoral fixation 12% patients had varus displacement of stem, 72% patients had bony ingrowth, 8% patients had fibrous ingrowth and 8% had loosening. On acetabular fixation bony 80% patients had bony ingrowth, 4% fibrous ingrowth and 16% were malaligned.

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