

COMPARATIVE ANALYSIS OF FUNCTIONAL OUTCOME OF LATERAL VERSUS POSTERIOR APPROACH IN TOTAL HIP REPLACEMENT

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Abstract

Background: Disease or trauma of Hip joint disabled individuals from daily activities. Total hip arthroplasty is reconstructive procedure that has improved the management of degenerative hip disease and old femoral neck fracture by restoring the normal hip biomechanics. We use various surgical approaches, each with unique advantages and disadvantages. Posterior approach is easy to dissect, less blood loss but high chance of sciatic nerve injury and post operative dislocation. In lateral approach dissection is extensive and provide good exposure but high chance of development of Abduction lurch gait.

Objective: To study comparative analysis of functional outcome of lateral versus posterior approach in total hip arthroplasty using uncemented primary THR prosthesis. **Materials and Methods:** 50 patients are randomly selected from outdoor and indoor orthopedics department of RGKMCH who fulfill the inclusion and exclusion criteria, divided them equally between lateral approach and posterior approach. We have assessed the preoperative and post operative (1 year) movements and gait kinetics using MODIFIED HARRIS HIP SCORE. **Result:** One year post operative functional assessment of gait shows in Lateral group 8 (32.0%) patients develop abduction lurch gait and 17(68.0%) patients have normal gait. In posterior group only 2 (8.0%) patients develop abduction lurch gait and 23 (92.0%) patients have normal gait. Modified Harris hip score in lateral group -Mean +/- S.D = 84.0800+/-7.8630 In posterior group is 74.1600+/-20.7980. Distribution of mean modified Harris hip score in one year post operative is statistically significant (P=0.0304). **Conclusion:** We concluded that lateral approach group patients shows more Abduction lurch gait compare to posterior approach. According to principal of gait posterior approach is better than lateral approach.

INTRODUCTION

Disease or Trauma of Hip joint disabled individuals from daily activities. Total Hip Arthroplasty with artificial prosthesis is reconstructive procedure that has improved the management of degenerative Hip disease and old femoral neck fracture by restoring the normal Hip Biomechanics and correction of deformity. With the advancement of Uncemented primary total hip arthroplasty and Bearing surfaces, patients are managed in various surgical approaches which have unique advantages and disadvantages. Posterior approach easy to dissect, lesser blood loss

and chance of sciatic nerve palsy, posterior dislocation is present. In lateral dissection is extensive, more blood loss and high chance of development of Abduction lurch.

Objective

To study the Comparative functional outcome of Lateral approach versus Posterior approach in Total Hip arthroplasty using uncemented primary Total hip replacement prosthesis.

MATERIALS AND METHODS

Study area: The study was conducted in R.G.KAR Medical college and hospital.

Study population: The patients taken from outdoor patient and indoor patient of Orthopedics department.

Study Design: Simple Random sampling.

Study Type: Prospective observational study.

Sample Size: 50 Patients had taken and equally divided into two group.

Study Period: The study was conducted from April 2020 to June 2021.

Inclusion Criteria

1. Unilateral Total Hip Arthroplasty.
2. Uncemented Hip Total Arthroplasty.
3. No History of previous injury or surgery to that leg.
4. Patient giving informed consent for the procedure.
5. Mean age 55.4(43-71), M: F 1:1, Mean BMI 27.1(range, 22.7-31.8).

Exclusion Criteria

1. Hip joint dysplasia and previous hip joint disorder in childhood.
2. Noncompliant to pre operation and post operation follow up.
3. Sensory and motor neuropathy.

Pre operative assessment: After getting informed and written consent, all the patients in both the groups were subjected for thorough clinical examination and investigation which include X-ray of Pelvis AP and AP and lateral views of that Hip, blood counts, ESR, CRP, urine culture sensitivity are done. Pre operative Tetanus toxoid, blood transfusion done, antibiotics, analgesics given adequately as per requirement before surgery. Any occult infection like skin lesions, dental caries, and urinary tract infection were identified and treated accordingly. Pre operative all movements, Gait, Modified Harris Hip score assessment done. Pre operative Templating with use plastic overlay templates both for femoral and acetabular components to select implant size and neck length for equal limb and medial offset. The medullary canal assessed with DOORS classification.

Surgical Exposure by Lateral Approach

Patient positioned in lateral decubitus. Incision started 5cm proximal to tip of greater trochanter, longitudinal incision centered over greater trochanter and extends down the line of the femur about 8cm. Split the fascia lata and retracted retract anteriorly to expose the tendon of Gluteus medius, Detach fibers of gluteus medius that attach to fascia lata. Splits the fibers of Gluteus medius

Longitudinally starting at the middle of greater trochanter, extends incision inferiorly through the fibers of vastus lateralis, develop anterior flap, expose the anterior joint capsule and anterior dislocation of femoral head were performed. Femoral neck osteotomy proceeds with acetabular preparation and removal of Osteophyte and loose bodies. The placement of the acetabular cup in 45-50 degree of inclination, femoral stem preparation done and stem is placed in 5-10 degree anteversion,

reduction done. Gluteus medius repair done properly and wound is closed in layers.



Figure 1: shows dissection Gluteus medius.

Surgical exposure by posterior approach. Patient is positioned in lateral positioned over unaffected side; sterile draping done. An incision centering the greater trochanter and 10-15cm long incision extending from the posterior border of greater trochanter curving posteriorly along the fibers of gluteus maximus 5cm below the posterior superior iliac spine and from greater trochanter along the shaft for approximately 10cm was made. Incise the fascia lata to uncover vastus lateralis, split the fibers of gluteus maximus, internally rotate the hip to place the short external rotators on stretch. Sciatic nerve identified and protected. Short external rotators are cut as close to its insertion to greater trochanter. Incise the capsule in T shaped and dislocate the head posteriorly after internal rotation of femur. Femoral neck osteotomy, acetabular preparation followed by acetabular cup is placed in 45-50 degree of inclination. Femoral canal preparation done and femoral stem is placed in 10 degrees of anteversion, reduction done, short external rotators are repaired, wound closed in layer by protecting the Sciatic nerve.

Post operative management

Post operative patients were given adequate antibiotic coverage, good analgesics, low molecular weight heparin and rest the limb in abduction pillow. The vitals parameters are closely monitored for 24 hrs. we have provided staged physiotherapy to all patient. The upper limb and chest physiotherapy and static quadriceps exercise on first day. The patient was made sit up on 3rd day, nonweight bearing standing at 5th day, walk with help of walker on 10th day. Patient was discharged with advices of not to adduct and internally rotate the limb, not to squat and walk with walker for 6wks.

Follow up protocol

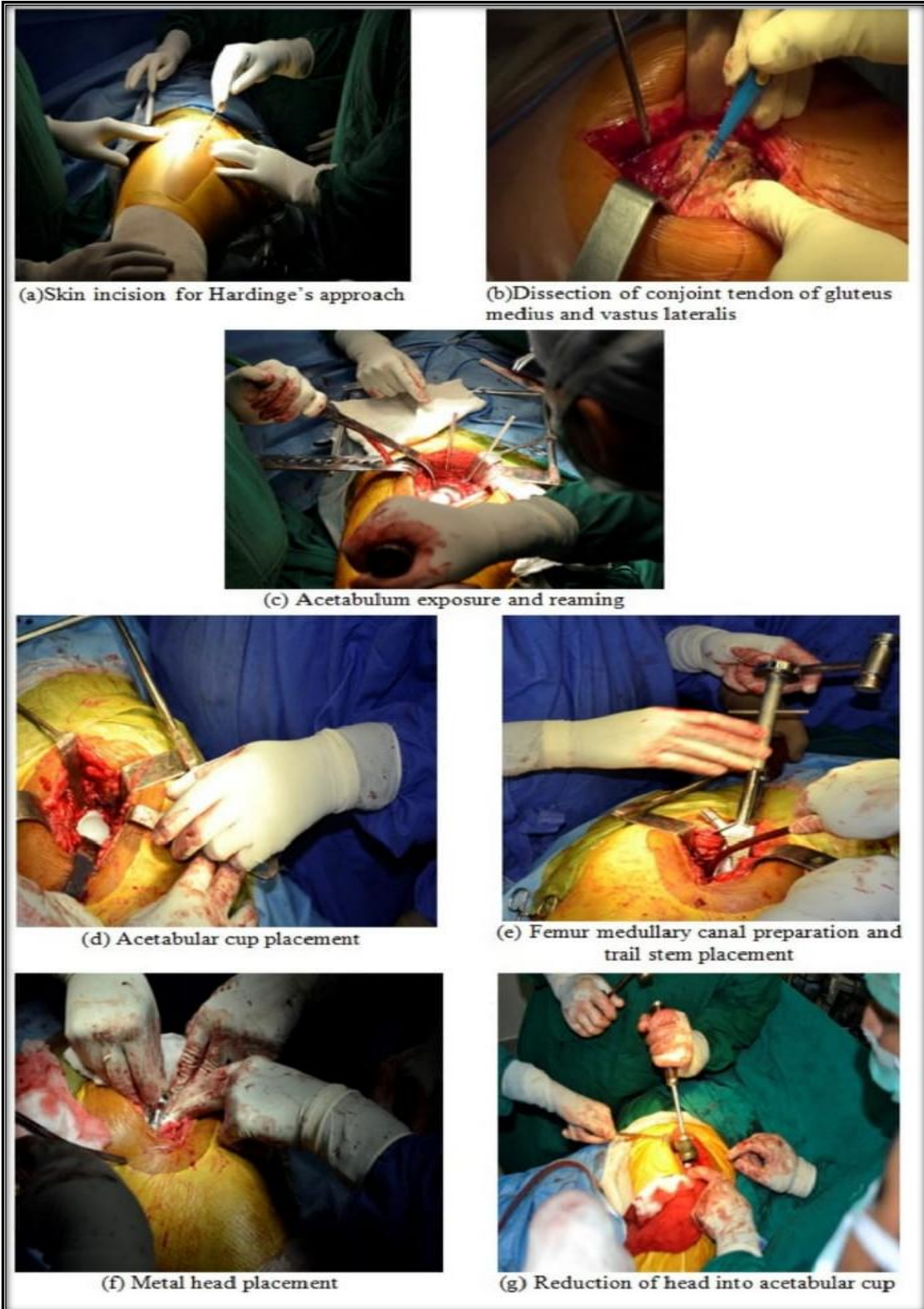
After discharge patients were followed in Outpatient department at 4th week, 8th week, 6th month and at 1 year of post operation with New digital x-ray of pelvis. In each patients were assessed for any complication like abduction lurch, infection, dislocation, implant loosening or migration of implant, nerve injury, if these was present then patients were treated accordingly.

RESULTS

In Lateral Approach Group, 8 (32.0%) patients had Abduction Lurch Gait and 17 (68.0%) patients had Normal Gait.

In Posterior Approach Group, 2 (8.0%) patients had Abduction Lurch Gait and 23 (92.0%) patients had Normal Gait.

Association of Gait at 1 Year Of POS-Op with Group was statistically significant ($p=0.0338$).





(a) Incision



(b) Femoral neck preparation



(c) Acetabular reaming



(d) Acetabular cup placement



(e) Femoral stem placement

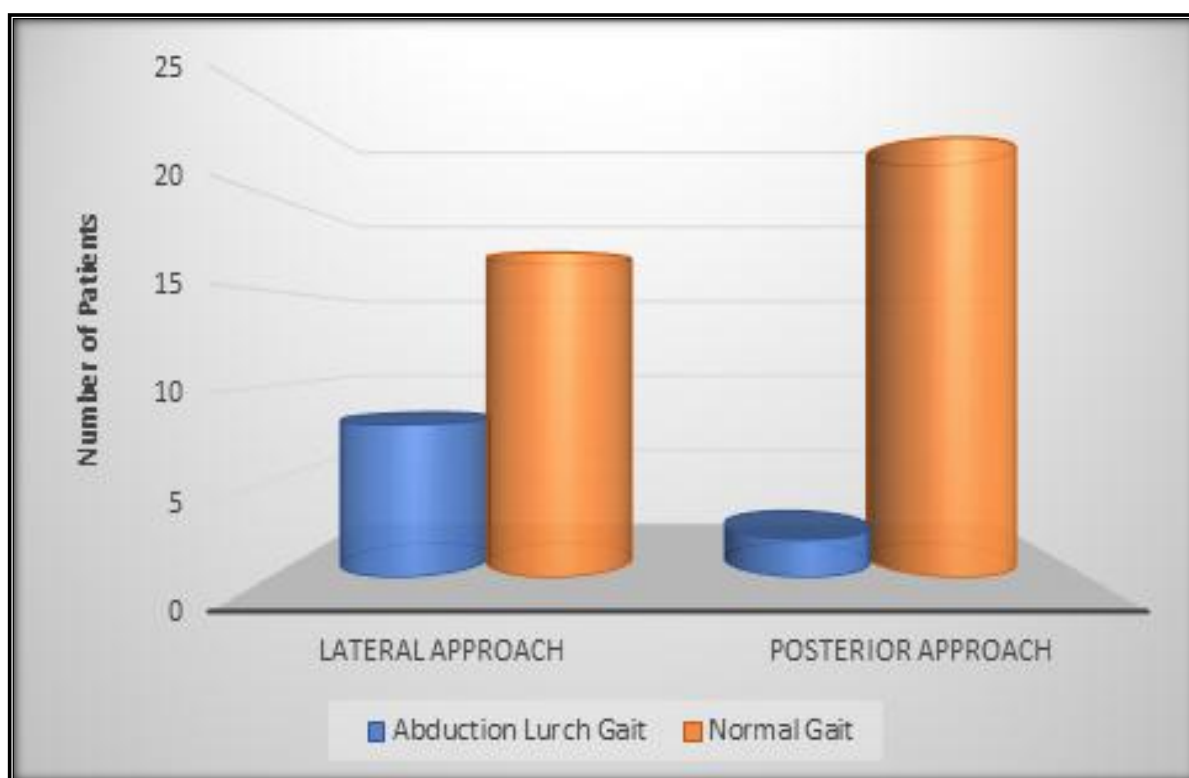


(f) Metallic head fixation



(g) Reduction of femoral head into acetabulum

GROUP			
Gait at 1 Year Of POS-Op	Lateral Approach	Posterior Approach	TOTAL
Abduction Lurch Gait	8	2	10
Row %	80.0	20.0	100.0
Col %	32.0	8.0	20.0
Normal Gait	17	23	40
Row %	42.5	57.5	100.0
Col %	68.0	92.0	80.0
TOTAL	25	25	50
Row %	50.0	50.0	100.0
Col %	100.0	100.0	100.0



In Lateral Approach Group, 1 (4.0%) patients had 10 Degree Abduction at POST-OP, 3 (12.0%) patients had 15 Degree Abduction at POST-OP, 4 (16.0%) patients had 20 Degree Abduction at POST-OP, 1 (4.0%) patients had 25 Degree Abduction at POST-OP, 8 (32.0%) patients had 45 Degree Abduction at POST-OP and 8 (32.0%) patients had 50 Degree Abduction at POST-OP.

In Posterior Approach Group, 1 (4.0%) patients had 15 Degree Abduction at POST-OP, 1 (4.0%) patients had 20 Degree Abduction at POST-OP, 1 (4.0%) patients had 40 Degree Abduction at POST-OP, 1 (4.0%) patients had 44 Degree Abduction at POST-OP, 10 (40.0%) patients had 45 Degree Abduction at POST-OP, 1 (4.0%) patients had 48 Degree Abduction at POST-OP and 10 (40.0%) patients had 50 Degree Abduction at POST-OP. Association of Abduction at POST-OP with Group was not statistically significant ($p=0.4100$).

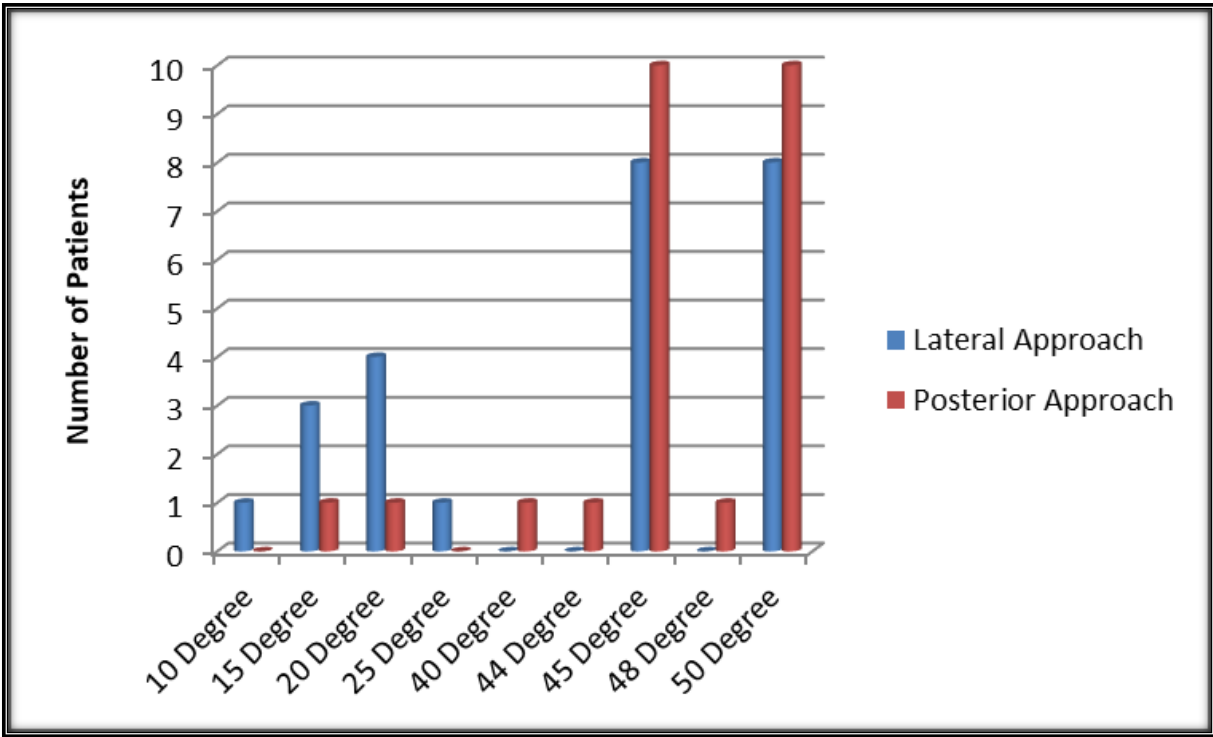


Figure 2: showing post op abduction at one year of follow up

Table 1: Distribution of mean Modified Harris Hip Score at 1 Year Post-OP : Group

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Modified Harris Hip Score at 1 Year Post-OP	Lateral Approach	25	84.0800	7.8630	58.0000	91.0000	87.0000	0.0304
	Posterior Approach	25	74.1600	20.7980	13.0000	91.0000	84.0000	

In Lateral Approach Group, the mean Modified Harris Hip Score at 1 Year Post-OP (mean± s.d.) of patients was 84.0800± 7.8630.

In Posterior Approach Group, the mean Modified Harris Hip Score at 1 Year Post-OP (mean± s.d.) of patients was 74.1600± 20.7980.

Distribution of mean Modified Harris Hip Score at 1 Year Post-OP with Group was statistically significant (p=0.0304).

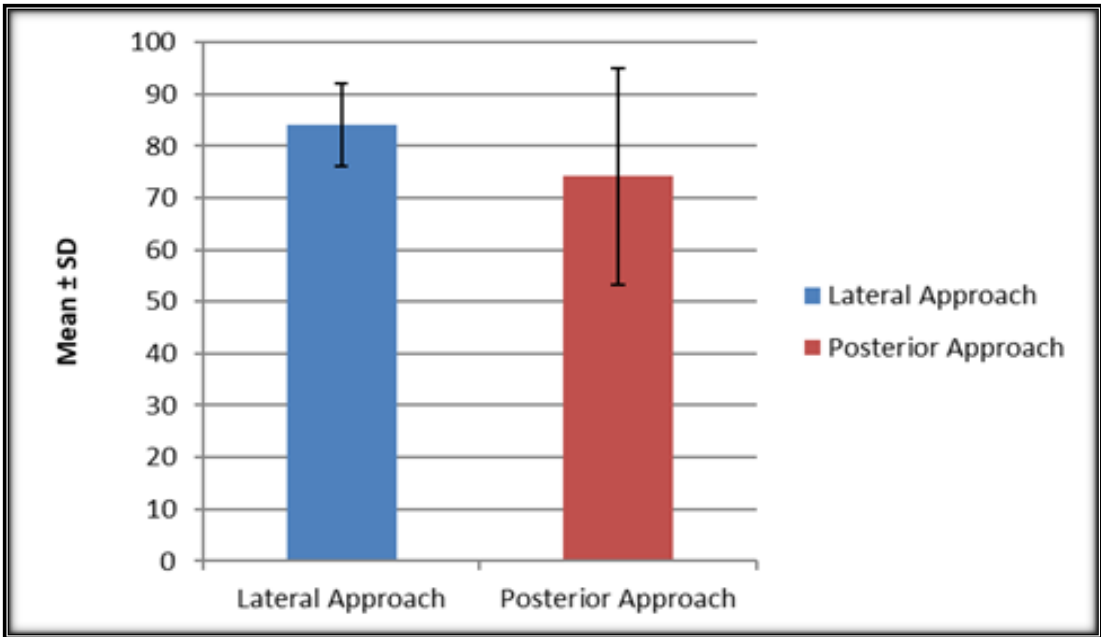


Figure 3: shows clinical outcome by lateral approach



Figure 4: shows clinical outcome by posterior approach



DISCUSSION

This Prospective and Retrospective observational study was calculate Simple random sampling and the study was conducted in the outpatient and inpatient department of orthopaedics at RG Kar Medical College and Hospital. All the patients presenting to the outpatient department of RG Kar Medical College and hospital study was conducted from April 2020 to June 2021. In our study showed that in Lateral Approach Group, 11 (44.0%) patients had Modified Harris Hip Score 12 at PRE-OP and 14 (56.0%) patients had Modified Harris Hip Score 22 at PRE-OP. In Posterior Approach Group, 12 (48.0%) patients had Modified Harris Hip Score 12 at PRE-OP and 13 (52.0%) patients had Modified Harris Hip Score 22 at PRE-OP. Association of Modified Harris Hip Score at PRE-OP with Group was not statistically significant ($p=0.7766$). In Lateral Approach Group, 2 (8.0%) patients had Nerve injuries. In Posterior Approach Group, 4 (16.0%) patients had Nerve injuries. Association of Nerve injuries with Group was not statistically significant ($p=0.3840$). In Lateral Approach Group, 1 (4.0%) patient had Limb Length Discrepancy. In Posterior Approach Group, 2 (8.0%) patients had Limb Length Discrepancy. Association of Limb

Length Discrepancy with Group was not statistically significant ($p=0.5515$). In Posterior Approach Group, 3 (12.0%) patients had Dislocation. Association of Dislocation with Group was not statistically significant ($p=0.0740$). In Lateral Approach Group, 3 (12.0%) patients had Complication. In Posterior Approach Group, 9 (36.0%) patients had Complication. Association of Complication with Group was statistically significant ($p=0.0469$).

Lateral Approach Group, the mean Modified harris hip score at PRE-OP (mean \pm s.d.) of patients was 17.6000 ± 5.0662 . In Posterior Approach Group, the mean Modified harris hip score at PRE-OP (mean \pm s.d.) of patients was 17.2000 ± 5.0990 . Distribution of mean Modified harris hip score at PRE-OP with Group was not statistically significant($p=0.7820$). In Lateral Approach Group, the mean Modified Harris Hip Score at 1 Year Post-OP (mean \pm s.d.) of patients was 84.0800 ± 7.8630 . In Posterior Approach Group, the mean Modified Harris Hip Score at 1 Year Post-OP (mean \pm s.d.) of patients was 74.1600 ± 20.7980 . Distribution of mean Modified Harris Hip Score at 1 Year Post-OP with Group was statistically significant ($p=0.0304$). We found that in Lateral Approach Group, 1 (4.0%) patients had 11 Degree Extension at PRE-OP In Normal Side, 4 (16.0%) patients had 12 Degree

Extension at PRE-OP In Lateral Approach Group, 6 (24.0%) patients had 12 Degree Extension At Post OP, 4 (16.0%) patients had 13 Degree Extension At Post OP, 10 (40.0%) patients had 14 Degree Extension At Post OP and 5 (20.0%) patients had 15 Degree Extension At Post OP. In Posterior Approach Group, 3 (12.0%) patients had 11 Degree Extension at Post OP, 8 (32.0%) patients had 12 Degree Extension at Post OP, 5 (20.0%) patients had 13 Degree Extension At Post OP, 5 (20.0%) patients had 14 Degree Extension At Post OP and 4 (16.0%) patients had 15 Degree Extension At Post OP. Association of Extension At Post OP with Group was not statistically significant ($p=0.2698$).

Our study showed that in Lateral Approach Group, 5 (20.0%) patients had 120 Degree Flexion at POST-OP, 2 (8.0%) patients had 124 Degree Flexion at POST-OP, 10 (40.0%) patients had 125 Degree Flexion at POST-OP, 2 (8.0%) patients had 126 Degree Flexion at POST-OP, 1 (4.0%) patients had 128 Degree Flexion at POST-OP and 5 (20.0%) patients had 130 Degree Flexion at POST-OP. In Posterior Approach Group, 1 (4.0%) patients had 115 Degree Flexion at POST-OP, 1 (4.0%) patients had 118 Degree Flexion at POST-OP, 4 (16.0%) patients had 120 Degree Flexion at POST-OP, 1 (4.0%) patients had 124 Degree Flexion at POST-OP, 4 (16.0%) patients had 125 Degree Flexion at POST-OP, 6 (24.0%) patients had 126 Degree Flexion at POST-OP, 4 (16.0%) patients had 128 Degree Flexion at POST-OP, 2 (8.0%) patients had 130 Degree Flexion at POST-OP, 1 (4.0%) patients had 60 Degree Flexion at POST-OP and 1 (4.0%) patients had 90 Degree Flexion at POST-OP. Association of Flexion at POST-OP with Group was not statistically significant ($p=0.2076$). Our study showed that in Lateral Approach Group, all patients [25 (100%)] had Bed Ridden Gait at PRE-OP. In Posterior Approach Group, all patients [25 (100%)] had Bed Ridden Gait at PRE-OP. In Lateral Approach Group, 8 (32.0%) patients had Abduction Lurch Gait and 17 (68.0%) patients had Normal Gait. In Posterior Approach Group, 2 (8.0%) patients had Abduction Lurch Gait and 23 (92.0%) patients had Normal Gait. Association of Gait at 1 Year Of POS-Op with Group was statistically significant ($p=0.0338$). In Lateral Approach Group, 12 (48.0%) patients had 40 Degree Abduction at PRE-OP In Normal Side and 13 (52.0%) patients had 45 Degree Abduction at PRE-OP In Normal Side. In Posterior Approach Group, 9 (36.0%) patients had 40 Degree Abduction at PRE-OP In Normal Side, 13 (52.0%) patients had 45 Degree Abduction at PRE-OP In Normal Side and 3 (12.0%) patients had 50 Degree Abduction at PRE-OP In Normal Side. Association of Abduction at PRE-OP In Normal Side with Group was not statistically significant ($p=0.1801$).

Also we found that in Lateral Approach Group, 1 (4.0%) patients had 10 Degree Abduction at POST-OP, 3 (12.0%) patients had 15 Degree Abduction at POST-OP, 4 (16.0%) patients had 20 Degree

Abduction at POST-OP, 1 (4.0%) patients had 25 Degree Abduction at POST-OP, 8 (32.0%) patients had 45 Degree Abduction at POST-OP and 8 (32.0%) patients had 50 Degree Abduction at POST-OP. In Posterior Approach Group, 1 (4.0%) patients had 15 Degree Abduction at POST-OP, 1 (4.0%) patients had 20 Degree Abduction at POST-OP, 1 (4.0%) patients had 40 Degree Abduction at POST-OP, 1 (4.0%) patients had 44 Degree Abduction at POST-OP, 10 (40.0%) patients had 45 Degree Abduction at POST-OP, 1 (4.0%) patients had 48 Degree Abduction at POST-OP and 10 (40.0%) patients had 50 Degree Abduction at POST-OP. Association of Abduction at POST-OP with Group was not statistically significant ($p=0.4100$).

CONCLUSION

We concluded that THR done in lateral approach, more number of patients develop ABDUCTION LURCH GAIT in comparison to posterior approach. According to my thesis principal for clinical assessment on the basis of GAIT posterior approach is superior that lateral approach.

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