Original Article

# FUNCTIONAL OUTCOME OF TOTAL HIP

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**ABSTRACT:** Osteoarthritis is a chronic, progressive articular disorder characterized by pain. More than 10% of people older than 60 years of age are affected by osteoarthritis of the hip. In the present study the functional outcome of the total hip arthroplasty was recorded. It was inferred from the current study that the functional outcome observations were highly encouraging. It is very normal observation that the patients were crippled because of the pain, loss of movements and inability to carry out day to day activities due to arthritis of hip joint. The same functional improvements were also recorded from the pre and post operative X-rays and examinations of the patients according to the Harris Hip Score (HHS). It was concluded from the current study that total hip arthroplasty is a safe surgical procedure with enormous benefits with minimal complications in our setup in experienced hands. It was further suggested that in the present study the time period of the study was short so in order to get better evaluation, longer follow up period is required.

**OBJECTIVES:** To evaluate the functional outcome of total hip arthroplasty in terms of pain relief, functional capacity, range of motion and absence of deformity using Harris hip score.

**STUDY DESIGN:** Descriptive case series study.

**PLACE OF STUDY:** Orthopaedic Department Shaikh Zayed Hospital, Lahore and Madina Teaching Hospital University Medical and Dental College Faisalabad.

**DURATION OF STUDY AND SAMPLE SIZE:** This study of 60 cases was conducted in one year.

**MATERIALS AND METHODS:** Sixty patients meeting the inclusion criteria were admitted through orthopaedics outpatient department of Sheikh Zayed Hospital Lahore and Madina Teaching Hospital University Medical and Dental College Faisalabad. Pre operative Harris scoring was done and was compared with the post operative score to find the improvement.

**RESULTS:** Average pre operative Harris hip score was 23.77±9.50 and post operative score was 87.90±10.42 and this score means good results.

**CONCLUSION:** It was concluded that THR is a safe surgical procedure with promising results in relieving pain, improving movements and upgrading the quality of life.

**KEY WORDS:** Total Hip Replacement, Harris Hip Score, Osteoarthritis, Ankylosing Spondylitis.

## INTRODUCTION:

The hip joint is a ball and socket joint of synovial variety. The normal hip is the result of intricate balance between a growing acetabulum, a growing proximal femur, and the vasculature that accommodates the bony changes[1]. Osteoarthritis is a chronic, progressive articular disorder characterized by pain[2].

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Osteoarthritis is by far the most common disease of the hip and has continuous increase in prevalence with increasing age[3,4]. More than 10% of people older than 60 years of age are affected by osteoarthritis of the hip[5]. The major milestones in the treatment of hip arthritis have been the development of acetylsalicylic acid in the mid 1800s with subsequent derivation of potent non-steroidal anti inflammatory drugs and Sir Charnley's total hip arthroplasty in the early 1960s, a procedure now widely held to be the most successful operation of the last 25 years.

Arthroplasty is the surgical refashioning of a joint, aims to relieve pain and to retain or restore movement. Total hip arthroplasty involves replacing both the acetabulum and the head and neck of femur[6]. Total hip arthroplasty is the most rewarding procedure in Orthopaedics in patient suffering from advanced degenerative disease of hip[7].The primary indication for total hip arthroplasty was incapacitating pain in patients with Osteoarthritis in whom conservative measures have failed, and secondary importance was the improved function of the hip[8].

Different systems of pre and postoperative assessment of hip are used but the commonly used system is the Harris scoring system[9]. Total hip replacement is frequently performed in our setup.THA is still in stage of infancy in our country because of lack of optimal theatre facilities, properly trained paramedics and high risk of infection. The aim of study was to assess the functional improvement after total hip arthroplasty, in addition to pain relief, by using pre and post op Harris hip rating and compare the results with the studies carried out locally as well as abroad.

## OBJECTIVES:

To evaluate the functional outcome of total hip arthroplasty in terms of pain relief, functional capacity, range of motion and absence of deformity using Harris hip score.

## MATERIALS AND METHODS:

### Operational Definition

**Pain relief:** Rating will be 0 to 44 according to Harris Hip Score.

**Functional capacity:** Functional capacity will be determined by assessing limp while walking, use of support while walking, distance walked and ability to; climb stairs, put on shoes and socks, sit in chair and use public transport. Rating will be 0 to 47.

**Range of motion:** Angles will be measured and scored 0 to 5.

**Deformity:** Flexion contracture and limb length discrepancy will be measured and rated 0 to 4.All these above mentioned rating will be done as per Harris hip score.

### Harris hip score

Maximum score100 points, results were considered:

90-100=excellent 80-90=good
70-80=fair <70=poor

The current study was descriptive Case series. The study was conducted and organized at Orthopedic Department Shaikh Zayed hospital, Lahore and Madina Teaching Hospital University Medical and Dental College Faisalabad. The study duration was one year with sixty patients having primary or secondary osteoarthritis hip. The non-probability but purpose sampling techniques was used.

## INCLUSION AND EXCLUSION CRITERIA:

The inclusion criteria was the patients 25 years old & above of either sex with Osteoarthritis hip (primary & secondary). The exclusion criteria was failed total hip arthroplasty, septic arthritis, neuropathic joints, neurological defects around hip (paralyzed abductors) and congenital defects.

## DATA COLLECTION PROCEDURE:

Sixty patients meeting the inclusion criteria were admitted through orthopaedics outpatient department of Shaikh Zayed Hospital Lahore and Madina Teaching Hospital University Medical and Dental College Faisalabad. Risks and benefits were discussed. They were asked to sign an informed consent form for surgery and using their data in research. A detailed history (pain at hip, decreased movement at hip, shortening of limb and limp.), physical examination (flexion contracture, limb length discrepancy and range of motion, deformity and gait analysis) and pre operative Harris scoring was done.

Diagnosis was confirmed with X-ray hip antero-posterior and lateral views. Baseline investigations including complete blood count, ESR, CRP, BUN, serum creatinine, PT, APTT, blood sugar, antiHCV And HBsAg were done. All the patients were operated on elective list. Preoperative antibiotic of 2nd generation cephalosporins was given at the time of induction.

## POSTOPERATIVE CARE:

- Limb was held in abduction by placing a pillow in between both thighs.
- For pain relief, injectable Narcotic analgesics and NSAIDs were given.
- Injectable antibiotic was continued 8 hourly for 3 days.
- Low molecular weight Heparin (Clexane) 20mg subcutaneously was injected once a day, for prophylaxis against D.V.T for one week.
- Physiotherapy was started on the first post operative day.
- Drain was taken out, once drainage was less than 50ml in 24 hours usually within 48 hours.
- Dressing was changed after 48 hours.
- Ambulation with the help of walker was started when pain free and Clexane was stopped within a week.
- Patient was discharged on 7th to 10th postoperative day.

## *FOLLOW-UP:*

- Patients were evaluated post operatively according to Harris hip score along with x-rays of the operated area at: 04, 08 and 12 weeks
  All the information regarding Harris hip score was collected through a specially designed proforma.

## STATISTICAL ANALYSIS:

All the data collected was analyzed using computer software SPSS 10 to find out frequencies and percentages of study variables. Descriptive statistics were applied to calculate mean and standard deviation of age and Harris hip score.

## RESULTS:

A total of 60 patients were included in the study. Out of 60 patients 34 (56.67%) were males and 26 (43.33%) were females. There was bilateral involvement of hips in 18 patients and 42 had unilateral involvement. The age ranged from 25 to 105 years. Mean age of patients was 52.53±18.21 years. AVN was observed to be the major cause 32 (53.3%) of secondary osteoarthritis in this series (Graph 1).

The average pre-operative and post-operative score for function and pain are given in Table 1.The average pre-operative range of motion score was 2.90±1.09 (range 0 to 5). At the last follow up, the average post-operative range of motion score was 4.73±0.45 (range 4 to 5).The average pre-operative deformity score was 2.53±1.96 (range 0 to 4). At the last follow up, the average post-operative deformity score was 4.00±0.

The average pre-operative and post-operative Harris hip score is given in (Table 1).Mean pre-operative Harris Hip Score in different diseases is shown in (Table 2).Mean post-operative Harris Hip Score in different diseases is shown in (Table 3).Mean improvement in Harris Hip Score in OA was 67.80±16.60, in AVN 61.50±9.67, in failed implant 70.00±9.78, in A.S 46.50±0.71, in RA 72.00±0.00(Table 5).Complications as shown in (Graph 2).

The result was rated as

Excellent = 90-100 Good = 80-89
Fair = 70-79 Poor = below70

The result was excellent for 36 (60.00%) of the hips, good for 14 (23.33%), fair for 4 (6.67%), and poor for 6(10.00%)

## DISCUSSION:

Total hip replacement (THR) is an effective treatment which improves function and relieves pain in the arthritis hip secondary to severe osteoarthritis or other diseases which affect the joint[10].Total hip arthroplasty (THA) is one of the most successful and efficacious procedures performed by orthopaedic surgeons. Currently, the most common methods of performing total hip arthroplasty utilize combinations of cemented or noncemented acetabular and femoral components, consistently offers drastic

improvement in pain, stiffness, and quality of life for the older individual with end-stage arthritis of the hip.

In our study the average age of the patients at the time of the operation was 52.53±18.21 years (range 25 to 105 years). In a study by Shahabud-ud-din et al. the average age of the patients at the time of the operation was 34 years (range 19—49years)[7]. In a study by Berli BJ et al. the mean age of the patients at surgery was 67.6 years (36 to 89) for the 76 women and 67.3 years (49 to 86) for the 45 men[11]. Study by Ragab et al. reported average age of the patients 62.6 years (range 39-84years) [12]. In a study by Todkar M et al. the average age of patients at the time of arthroplasty was 65 years (range 50 to80 years)[13]. In a study by Iqbal P et al.mean age was 48 years (ranged from 21 to 75 years)[14] .In a study by Ghani I et al. the average age of the patients at the time of the operation was 57 years (range 25—87years)[15] .Osteoarhritis of knee and hip represent at an early age group in this part of the world (South Asia ) which is most likely due to our sitting,praying,eating and working habits,which need squatting.The use of indoor/outdoor toilets also put excessive stress and strain on knee and hip joints.So patients in our study underwent arthroplasty (mean age 52.53±18.21 years) almost one decade earlier than the average age of the patients who underwent arthroplasty in western countries[11,12].

Todkar M et al. reported diagnosis of osteonecrosis of head of femur in 39 (78%) cases, rheumatoid arthritis in 5 (10%) cases, ankylosing spondylitis in 4 (8%) cases, post-traumatic arthritis of hip in one (2%) case and osteoarthritis in one (2%) case[16].Ghani and colleagues[6] in a study of 20 patients had rheumatoid arthritis 35%, osteoarthritis 10%, failed hemiarthroplasty 25%, fracture neck of femur 20% and failed implant for fracture neck of femur in 10%[15].Shahabud-ud-din and colleagues in a study of 20 total hip replacement AVN 70%,A.S 10%, Fracture acetabulum 10% and unknown10%[7] . In a study by Iqbal P et al. the pre-operative diagnosis was secondary osteoarthritis in 45(62.5%), primary osteoarthritis 10 (13.89%), avascular necrosis in 04 (5.56%), ankylosing spondylitis 6(8.33%) and rheumatoid arthritis in 7 (9.72%)[14].

The average preoperative Harris hip score in the present study was23.77±9.50 points, In a study by Ragab et al.The average preoperative Harris hip score was 48 points. Pospischill M et al. reported the latest mean post-operative Harris hip score 89.2 (32 to 100). At a mean follow-up of 14.4 years, the clinical ratings were graded as excellent and good in 83 (80.1%), fair in eight (7.7%) and poor in 12 (11.6%) of all reviewed hips. The mean pain score was 41.6 (10 to 44). A maximum pain score of 44 (i.e no pain) was found in 89 (86.4%) of all evaluated hips[16]. In a study by Berli BJ et al The mean pre-operative Harris hip score improved from 73 (49 to 83) to 96 (72 to 100) post-operatively[11]. In a study by Bourne RB et al One hundred and thirty-one hips were available for the latest follow-up examination. The mean post operative Harris hip score for all 131 hips was 89 ± 10 points[17].

In a study by Todkar M et al The average preoperative Harris Hip Score in patients having osteonecrosis of head of femur was 43 and it went up to 88 postoperatively. In rheumatoid hips the score improved to 82 from a preoperative average value of 45. In cases of ankylosing spondylitis the average preoperative score was 49 and the postoperative score was 83. In cases of osteoarthritis the average preoperative score was 47 and it improved to 87 after total hip replacement[16].Improvement in Harris hip score in our study is comparable to other studies .

Post operative dislocation, a typical early complication occurs mostly within three months after surgery. In uncomplicated cases incidence of dislocation is1-2%[18]. However in cases of revision hip surgery risk can increase up to 10%[19].the rate of dislocation in much larger series was reported to be 3%[20].in present study there were four (6.67%) dislocations.In a study by Berli BJ et al. there was one dislocation and it was treated by closed reduction[11].Shahabud-ud-din and colleagues in a study of 20 total hip replacements reported dislocation rate of 5% that necessitated a revision operation[7].Iqbal P and colleagues in a study of 72 total hip replacements reported rate of dislocation 7%[14].The incidence of infection after primary THR is 1%.It is expensive, time consuming to

treat and usually results in poor functional outcome[21]. Patient who may be at increased risk include severe rheumatoid arthritis, on steroids , with previous hip surgery and persons with history of infection in and about the hip[22].ESR is elevated but is non specific especially in immediate post op period[23.] Aspiration and C/S for organisms is frequently diagnostic[24].In present study two patients had superficial infection (3.33%) which settled with 2 weeks of antibiotic coverage.

Shahabud-ud-din and colleagues in a study of 20 total hip replacements reported infection rate of 5%[7].Iqbal P and colleagues reported infection rate of 4%[14]. In a study by Todkar M et al. a deep infection had developed in one (2%) of the fifty hips[16].

Subsidence of the femoral component was defined by the distance measured between the most medial point of the lesser trochanter and the proximal tip of the stem on the pelvic radiograph. In a study subsidence occurred in two femoral components (1.9%), and was attributed to undersized stems[13].In present study two patients had subsidence (3.33%) for which redo-surgery was carried out.Intra operative periprosthetic femoral fractures have received greater attention in the literature than acetabular fracture, possibly because of the difficulty in identifying intra operative acetabular fracture at the time of the operation[4].the risk of an intra operative femoral fracture has been shown to be when a cementless femoral component is used in revision THA[25]. Shahabud-ud-din and colleagues in a study of 20 total hip replacements reported periprosthetic fracture rate of 5%[7].

Venous thromboembolic disease is common following hip arthroplasty[26].The cumulative incidence of symptomatic venous thromboembolism was 2.7% (150 of 5607), of which 1.1% had developed pulmonary embolism, 1.5% had deep venous thrombosis and 0.6% had both[27].In the present study there was no incidence of thromboembolism

Sciatic nerve palsy is a recognized complication of primary total hip replacement. this complication was rare with an incidence of < 0.2% in the past ten years. They describe six cases of sciatic nerve palsy occurring in 355 consecutive primary total hip replacements (incidence 1.69%).Each of these palsies was caused by post-operative haematoma in the region of the sciatic nerve[28].In the present study there was no incidence of Sciatic nerve palsy.

Bourne RB et al. In a study of one hundred and thirty-one hips reported the result of excellent for seventy-six hips, good for thirty-four, fair for fifteen, and poor for six[17].

Shahabud-ud-din and colleagues in a study of 20 total hip replacements reported result as excellent for 5 (25%) of the hips, good for 9 (45%) of the hips, fair for 4 (20%) of the hips, and poor for 2 (10%) of the hips[7].In a study by Pospischill M et al. at a mean follow-up of 14.4 years, the clinical ratings were graded as excellent and good in 83 (80.1%), fair in eight (7.7%) and poor in 12 (11.6%) of all reviewed hips. The mean pain score was 41.6 (10 to 44) and the mean functional score 47.6 (17 to 56)[13].Iqbal P and colleagues in a study of 72 total hip replacements result was reported as excellent for 43 (59.72%) of the hips, good for 15 (20.83%) of the hips, fair for 10 (13.89%) of the hips, and poor for 4(5.56%) of the hips[14].Overall results of this study are encouraging and comparable to other studies carried out locally as well as abroad.

**Figure 1: X-ray showing Bilateral Ankylosing Spondylitis of Hip**

**Figure 2:Post operative X-ray of patient in fig. 2**

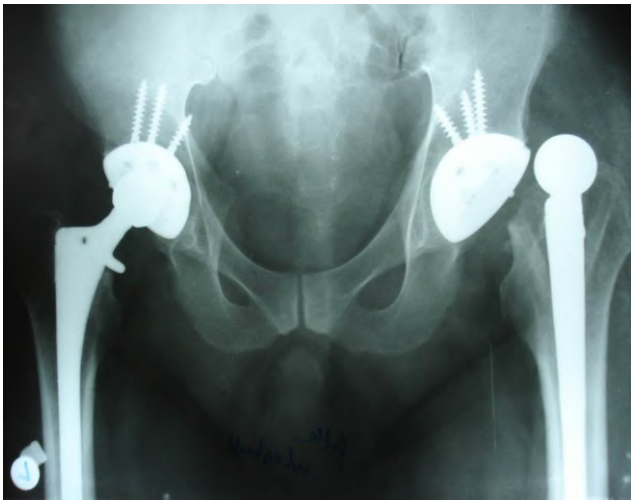


**Figure 3:X-ray showing Dislocated Rt. Hip Along with Peri-Prosthetic Fracture**

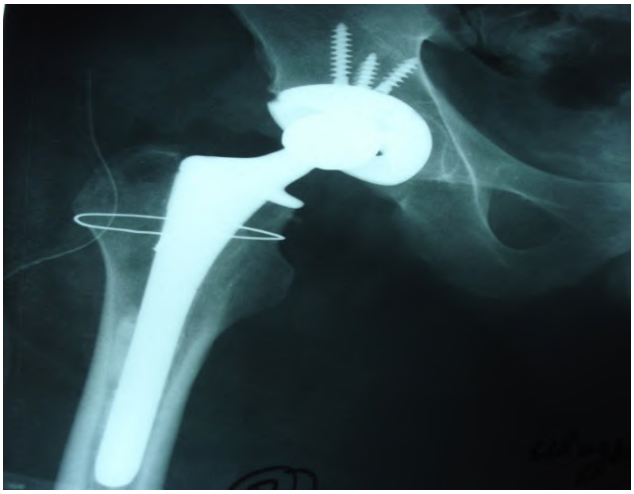
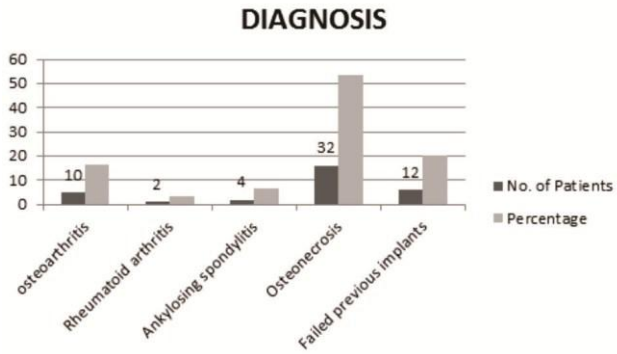


**Figure 4:X-ray showing Avascular Necrosis of Rt Hip**


**Figure 5:Post operative X-ray of patient in fig. 4**


**Graph 1: Frequency of different diseases**




**Graph 2: Complications (n=60)**

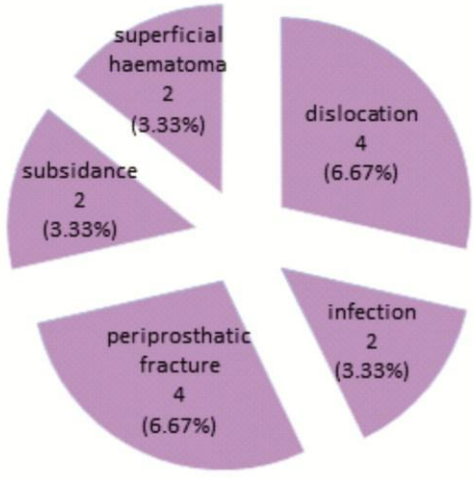


**TABLE 1. Function score, pain score and Harris hip score (n=60)**

| Function score | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|
| Pre-operative | 0.00 | 20.00 | 8.27 | 5.50 |
| Post-operative | 9.00 | 47.00 | 36.30 | 9.42 |
| Improvement | 4.00 | 43.00 | 28.03 | 9.25 |

| Pain Score | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|
| Pre-operative | 0.00 | 20.00 | 10.00 | 5.25 |
| Post-operative | 30.00 | 44.00 | 42.87 | 2.86 |
| Improvement | 20.00 | 44.00 | 32.87 | 5.75 |

| Harris hip score | Minimum | Maximum | Mean | Standard deviation |
|---|---|---|---|---|
| Pre-operative | 3.00 | 38.00 | 23.77 | 9.50 |
| Post-operative | 62.00 | 100.00 | 87.90 | 10.42 |
| Improvement | 44.00 | 93.00 | 63.60 | 11.81 |

**TABLE 2 Mean pre- operative Harris hip score in different diseases (n=60)**

| Serial # | Diagnosis | Mean | Standard Deviation |
|---|---|---|---|
| 1 | OA | 26.20 | 13.88 |
| 2 | AVN | 24.44 | 8.23 |
| 3 | Failed Implant | 19.33 | 10.09 |
| 4 | A.S | 23.50 | 12.02 |
| 5 | RA | 28.00 | . |
| | Total | 23.77 | 9.50 |

OA = Osteoarthritis

**Table 3 Mean post- operative Harris hip score in different diseases (n=60)**

| Serial # | Diagnosis | Mean Post-Operative Score | Standard Deviation |
|---|---|---|---|
| 1 | OA | 94.00 | 4.53 |
| 2 | AVN | 86.94 | 11.28 |
| 3 | Failed Implant | 89.33 | 2.50 |
| 4 | A.S | 70.00 | 11.31 |
| 5 | RA | 100.00 | . |
| | Total | 87.90 | 10.42 |

AVN = Avascular Necrosis, A.S= Ankylosing Spondylitis, R.A = Rheumatoid Arthritis, OA = Osteoarthritis

AVN = Avascular Necrosis, A.S= Ankylosing Spondylitis, R.A = Rheumatoid Arthritis,

**Table 4 Mean improvement in Harris hip score in different diseases (n=60)**

| Serial # | Diagnosis | Mean | Standard Deviation |
|---|---|---|---|
| 1 | OA | 67.80 | 16.60 |
| 2 | AVN | 61.50 | 9.67 |
| 3 | Failed Implant | 70.00 | 9.78 |
| 4 | A.S | 46.50 | 0.71 |
| 5 | RA | 72.00 | . |
| | Total | 63.60 | 11.81 |

AVN = Avascular Necrosis, A.S= Ankylosing Spondylitis, R.A = Rheumatoid Arthritis, OA = Osteoarthritis

## CONCLUSION:

It may be inferred that the results are similar to other studies and are highly encouraging. The patients were crippled because of the pain, loss of movements and inability to carry out day to day activities. All the patients have shown significant improvement in relief of pain, range of movement and deformities. All the patients are very well adjusted to the changed life style required after total hip replacement. Most of the patients were satisfied.

Considering the results of this study this can be said that total hip arthroplasty is a safe surgical

procedure with minimal complications in our setup in experienced hands. It provides enormous benefits to the patients in relieving their pain, improving movements of the joint and upgrading the quality of life. Total hip arthroplasty is boon to the patients crippled because of arthritis of hip, as movement is life. As the study period was short so in order to get better evaluation, longer follow up period is required.

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We, Ahlul Bayt (chosen descendants of the Holy Prophet), hold such central and balancing position in religion that those who are deficient in understanding and acting upon its principles, will have to come to us for reformation, and those who are overdoing it have got to learn moderation from us.

A Divine rule can be established only by a man, who, where justice and equity are required, neither feels deficient nor weak and who is not greedy and avaricious.

***Hazrat Ali (Karmulha Wajhay)***