Section: Orthopedics

Original Research Article

A STUDY ON FUNCTIONAL OUTCOME OF TOTAL HIP ARTHROPLASTY

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ABSTRACT

Background: To study the functional outcome following Total Hip Arthroplasty in various disorders of hip and efficacy of Primary Total Hip Arthroplasty by clinical and radiological signs in post-operative period.

Material and Methods: This study was conducted in Department of Orthopaedics in patients presenting to the OPD and emergency for a period of 2 years were operated upon using cemented, uncemented and hybrid Total Hip Arthroplasty. Age ≥ 50 yrs of all primary osteoarthritis of the hip joint, avascular necrosis of hip with osteoarthritis, neglected cases of fracture neck of femur, failed hemiarthroplasty of hip and Secondary osteoarthritis due to healed infections are included in study.

Results: 20 hips were operated for 17 patients for avascular necrosis (7 hips), fracture neck of femur (2 hips), ankylosing spondylitis (2 hips), failed hemiarthroplasty (3 hips) and osteoarthritis (6 hips). Harris hip score was used for evaluation of functional outcome which was on an average 35.88 (21-57) preoperatively and 91.05 (75-97) postoperatively. Age of patients ranges from 50-67 years. There is no pain in 94% of patients postoperatively and slight pain in 6% patients. No limp is present in 60% and slight limp in 40% of patients. The femoral component was in neutral alignment in 16 hips (80%), in less than 10o valgus in 2 hips (10%) and less than 10o varus in 2 hips (10%). No shift in the position of any femoral component or any crack in the cement mantle was seen. Postoperative superficial infection was seen in 1 patient. One hip had a lengthing of 1 cm. One hip had anterior dislocation. One patient with bilateral THR had a complication of DVT which was treated with anti-coagulants. Excellent results were achieved in 70% of patients, good results in 24% of patients postoperatively. Full weight bearing was achieved on 2nd postoperative day in all patients. Cemented THR is more cost efficient when compared to uncemented THR.

Conclusion: It is concluded that in properly selected cases, THA offers a good procedure currently available for hip joint pathologies in selected patients. The Harris Hip Score significantly improved in these patients.

Key Words: Total Hip Arthroplasty, Radiographic teardrop, Congenital Dislocation of Hip, Cemented Acetabular.

INTRODUCTION

The human hip joint is extremely complex on account of the functional demands onit by the body. On account of its complex biomechanics & important function, a stable painless hip is required for normal locomotion. Number of diseases affects the hip joint. This number has grown over the years as the life expectancies of individuals have increased. In the beginning the thought of operating on the hip deterred even the most aggressive surgeons. With the improvement in anaesthesia, post-operative care and especially the aseptic operating room ritual has brought the risk of operating on the hip very low, thus increasing the widespread acceptance of elective surgery. Although hip surgery had its root in the 19th century, its greatest period of growth & development

has occurred in 20th century. An ever growing population of chronic joint disease demanding relief of pain & disability has led to development of operating such as osteotomy & arthroplasty.[1,2]

The original intent of arthroplasty was to restore motion to an ankylosed joint. This concept has expanded to include the restoration as far as possible the integrity & functional power of a diseased joint. While a resection restores motion arthroplasty must not only restore motion but also provide stability to the joint. While in an arthrodesis, the purpose of the operation is to create raw cancellous bone surface on each side of the joint & hold them in rigid apposition. In an arthroplasty, the purpose of the operation is to shape the ends of the bones & to hold the surfaces apart, almost always using some material interposed between the fragments. Total joint replacement has undergone many changes since it was first attempted in the early 20th century. It was on the basis of failures of previous surgeries & valuable clinical experience from it by the surgeons that these changes were introduced.[3,4]

Many condition of bone are repaired initially by fixation. If the fixation / repair fail, replacement has to be done. Among many types of arthroplasties, total joint arthroplasty is the one. Among which total hip replacement was the first replacement surgery which was done. Initially, bone cement was used to fix the articulating surfaces of the THA to the bony ends. But high rates of loosening of the implants, especially the acetabular components led to a change in the technique of fixation of the implants. Thus bone in growth for biological fixation was introduced. The technique of cementless Total Hip Arthroplasty could be used in younger patients in the hope that it might last longer. However, failures in femoral stem fixation on account of little bone ingrowth, thigh pain & ideal method of fixation of the femoral stem. Cemented Acetabular and cemented femoral stem fixation is advised in elderly patients. A study has been conducted to evaluate clinical & radiological results of cemented THR in various disorders of Hip in the Department of Orthopaedics, SVS Medical College and hospital, Mahabubnagar during August 2013 to August 2015.

MATERIALS AND METHODS

This study was conducted in Department of Orthopaedics in SRI VENKATA SAI Medical College, Mahabubnagar, patients presenting to the OPD and emergency between August 2013 and August 2015 were screened for various disorders of hip.

Patients were operated upon using cemented, uncemented and hybrid Total Hip Arthroplasty.

Inclusion Criteria: Age ≥ 50 yrs of all primary osteoarthritis of the hip joint, avascular necrosis of hip with osteoarthritis, neglected cases of fracture neck of femur, failed hemiarthroplasty of hip and Secondary osteoarthritis due to healed infections.

Exclusion Criteria: Revision case, Fresh fractures, Presence of acute infections anywhere in the body and patients with neurological disorders.

Detailed history, clinical examination, and radiological examination were carried out in all patients. Salient features included

Pain site, severity, mode of onset, character, diurnal variation, radiation and relation with rest and activities, relieving and aggrevative factors.

Deformity mode of onset, progressive or static, disability due to deformity

Limitation of movement as progressive or static are noted.

Constitutional features as fever, anorexia, urinary infection, night sweating are noted.

Investigations required for the study are Hb%, TLC, DLC, Blood Sugar, ESR , C-Reactive protein, Serum Creatinine, Blood Urea, ECG, HBsAg, HIV by ELISA and Urine routine

Special Investigations as RA factor, PFT and HLA B27 Typing are done.

Radiological Investigations as X-Ray chest PA, pelvis with both hips AP, both hips with thigh- R & L and LS Spine (in selected patients)

Patients were evaluated and data recorded on the basis of Harris hip score. Preanaesthetic assessment was done on all patients. The patients were admitted 72 Hours prior to surgery for education regarding the rehabilitation program to be followed subsequent to surgery. Patients were started on chest physiotherapy and static quadriceps, hamstring and gluteal exercises. Patients were told about back- care and ways to lift themselves for use of bedpan.

Patients were explained in detail about surgery, possible complications and limitations to be followed after surgery.

Contraindications

Active infection of the hip joint, bladder, chest or any other region, any process that is rapidly destroying bone, absence or relative insufficiency of abductors and progressive neurological disease.

Pre Operative Planning, Anaesthesia fitness, Physician fitness are done

Special precaution in the cases for high PE risk - Heparin/ LMWH Basic blood investigations including CRP levels. Special care for the urinary tract infections in the elderly. X-ray of pelvis with both hips with the uninvolved hip in 15-30 degrees of internal rotation

Lateral X ray of the affected side and AP X-ray look for femoral head size sizing of the femoral medullary canal templating for the femoral stem neck shaft angles femoral shaft angulations - curvature condition of the calcar/ greater trochanter vertical and horizontal offsets

Pre Operative Regimen

Patients were shaved of all hair from nipples to toes both anteriorly and posteriorly in minor O.T just prior to shifting the patient to major O.T. They were made

to have a through wash with soap and water since two days prior to surgery. Nails were cut short. Proctoclysis enema was given one night before; pre operative prophylactic injectable antibiotics were started on all patients from 12 hours prior to surgery and continued till 5 days post operative. These were then switched to oral antibiotic till the time of stitch removal.

All the patients were started Ceftriaxone + Sulbactum 1.5 gram and Amikacin 500mg intravenously after test dose every 12 hourly, dose was adjusted according to the body weight and renal functions of the patients.

Inj Tetanus toxoid was also given pre operative 0.5 cc intramuscular. Fresh grown and gloves were kept for the case. Instrumentation was autoclaved and Operation Theatre was fumigated. All operative surgeons and staff nurses scrubbed for 10 min and double mask and gloves were used for surgery. Ceftriaxone + Sulbactum 1.5 gm was also given at the time of induction of anaesthesia, urinary catheter was introduced in all patients just prior to surgery.

Post-Operative Regimen: The foot end of the bed was elevated for 4 hours. A pillow was kept in between the two legs so that the limb was in abduction. Half hourly TPR and blood pressure charts were maintained for the first 24 hours.

Patient is again assessed after 6 months. Hence the patient is evaluated after 6 weeks, 2 months, 6 months 1 year and 1 1⁄2 years after surgery, and then yearly. Results are evaluated both clinically and radiographically. Subsidence, osteolysis and loosening of implants are assessed on subsequent radiographs and compared with previous X-rays.

Patient is evaluated according to Harris hip score, which gives points to pain, function which is assessed in terms of gait and activities, deformities and range of motion. These scores are compared with preoperative scores, and the score at the last follow-up. Patient is also examined radiographically at discharge and at each follow up visit with anteroposterior and lateral views.

Follow up radiographs were assessed for any evidence of radiolucency at the cup bone interface. The width of the radiolucency was measured on the radiographs without correction for magnification.

The width was the divided into four categories-

Less than 1⁄2 mm;

Less than 1 mm;

Less than 1-1/2 mm and Greater than 1-1/2 mm

For evaluation of the femoral components, the grade of initial cement mantle and the position of the component within the femur were assessed

Grade A cement mantle completely filled the femoral canal in all areas (white out), extended 2 cm distal to the tip of the prosthesis and was at least 2 mm thick in all areas without focal voids.

Grade B cement mantle also filled the femoral canal completely, but areas of trabecular bones surrounding the stem were not completely filled with cement.

Grade C1 mantle had voids or bubbles in the cement.

Grade C2 mantle had focal deficiencies in the cement so that small portions of the stem were in contact within the bone.

Grade D cement mantle had multiple focal deficiencies, no cement distal to the tip of the stem or radiolucent lines at the cement prosthesis interface.

The femoral component was considered definite loose if there was definite evidence of migration. This included appearance of radiolucent line at the cement stem junction that did not exist in the immediate post operative radiographs. Radiographs made with the patient in same position, a discernible shift in the position of femoral components or the cement mantle (called subsidence) or both, appearance of a crack in the cement or a fracture of the stem.

Possible loosening was defined as the presence of radiolucent zone between the cement and bone that occupied more than 50% but less that 100% of cement bone interface on either an anteroposterior or lateral radiograph or both, and has not been present on the immediate post operative radiographs.

RESULTS

This study was conducted in Department of Orthopaedics in SVS Medical College and Hospital, Mahabubnagar. 20 hips were operated, for various disorders of hip joint using cemented acetabular component and cemented femoral component. Following results were obtained. [Table 1]

Age varied from the lowest of 50 to a highest of 67 years. Mean age of patient in our study was 55.87 years. 10 patients were male and 7 were female. Mean weight of patients operated was 60 kg. (Range = 48-74).

Avascular necrosis was seen in 7 hips (35 %). It was due to steroids in 2 hips, taken for skin disorder. It was post-infective in 02 hips and idiopathic in 2 hips and post traumatic in 1 hip.

Neglected Fracture neck of femur was present in 02 hips (10 %). 03 (15%) hips were of failed hemiarthroplasty operated 11⁄2 year back. Ankylosing spondylitis was the preoperative diagnosis in 02 hips (10 %). All patients had spine and sacro-iliac involvement. 6 hips (30 %) were diagnosed as osteoarthritis, in which 04 hips were primary osteoarthritis, 02 hips were secondary due to post traumatic.

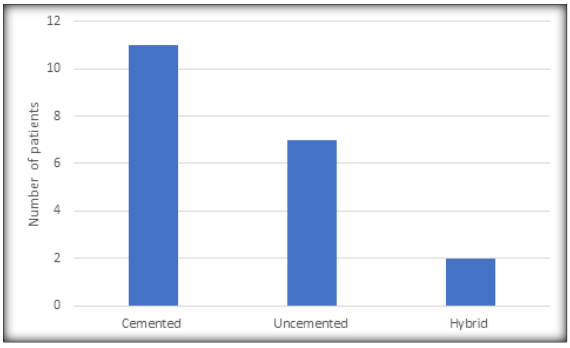

Figure 1: Type of Total Hip Replacement

Mean preoperative Harris hip score was 35.88, ranging from 21-57. This score had improved postoperatively to 91.05 (Range = 75- 97).

Preoperative, marked pain was present in 58.8% of our patients; moderate pain was present in 41.1% of patients.

At the latest follow up 94% patients had no pain or slight pain. Only 6% patients had mild pain for which analgesics were required. [Table 2]

While 100% patients had a limp preoperatively, only 41% of the patients had slight limp post-operatively, 59% patients had no limp.

While 94% patients required a support for ambulation preoperatively, only 47% required a support occasionally postoperatively, 53% required no support for walking.

Preoperatively 29% of the patients were restricted to indoor activities or bed only, 53% of patients able to walk up to 2 or 3 blocks. Post operatively, 18% of the patients could not walk for long distances and 82% were able to walk for unlimited distance.

50% of the patients had a significant deformity preoperative (more than 30 degree fixed flexion, more than 10 degree fixed adduction, more than 10 degree fixed internal rotation in extension, limb length discrepancy more than 3.2 cm). Post operatively, only 6% of the patients had any significant deformity remaining. [Table 3]

All patients had poor Harris hip score preoperatively. 6% patients had fair results 24% patients had good results, 70% patients had excellent results postoperatively.

Results of the radiographic evaluation on all hips on all follow up visits were as follows

The cement mantle was assessed in all 12 hips about the femoral component. The column of cement distal to the tip of the component was assessed. [Table 4]

The femoral component was in neutral alignment in 16 hips (80 %), in less than 10 degree valgus in 2 hips (10%) and in less than 5 degree of varus in 2 hips (10%). At the last follow up, no radiographs showed any evidence of a new radiolucency, any shift in the position of any femoral component or any crack in the cement mantle.

Acetabular Component: No gap between the bone and the acetabular component on initial postoperative radiographs.

At the latest follow up 12 acetabular components did not show any evidence of horizontal or vertical migration. 1 hip had radiolucent line at the bone-cement prosthesis on radiograph. There were no fractures.

Complications

1. Superficial infection was noted in one patient on routine wound inspection on 8th post-operative day. Wound was explored and no communication was found beneath the deep fascia. So superficial tissues were debrided and they healed well on antibiotics.
2. One hip had a lengthing of 1 cm.
3. One patient with bilateral THR had a complication of DVT which was treated with anti- coagulants.
4. One patient had anterior dislocation of hip joint.

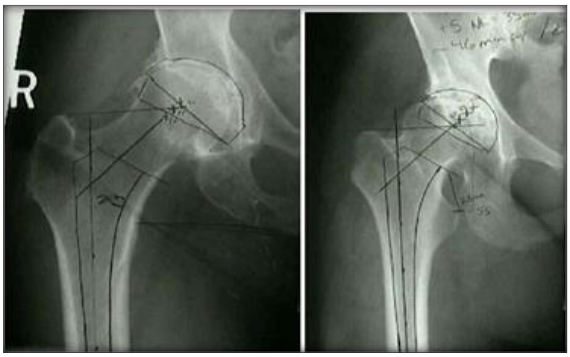

Figure 2: Clinical Photos

Pre OP X ray

Immediate Post OP X ray

Follow up X ray at 10 months

Flexion

Adduction

Straight leg raising

Cross leg sitting

Abduction

Dislocation of femoral head

Table 1: Demographic details in patients of present study

Age (in years)	No. of Patients	Percentage (%)
50-55	8	47.04%
56-60	6	35.28%
61-65	2	11.76%
66-70	1	5.88%
Side		
Right	8	47.04%
Left	6	35.28%
Bilateral	3	17.64%

Table 2: Diagnosis in present study

Diagnosis	No. of Hips	Percentage (%)
AVN Femoral Head	7	35
Osteoarthritis	6	30
Failed Hemiarthroplasty	3	15
Neglected Fracture Neck of Femur	2	10
Ankylosing Spondylitis	2	10

Table 3: Description of pain preoperatively and post operatively

Description of pain	Preoperative (%)	Postoperative (%)
Marked Pain	58.8	0
Moderate Pain	41.1	0
Mild Pain	0	6
Slight Pain	0	59
No Pain	-	35

Table 4: Limp preoperatively and postoperatively

Limp	Preoperative (%)	Postoperative (%)
Severe	41	0
Moderate	47	0
Slight	12	41
None	-	59

Table 5: The cement mantle was graded in present study

Grading	Percentage (%)	No. of Hips
Grade A	58%	07
Grade B	25%	03
Grade C1	8.5%	01
Grade C2	8.5%	01
Grade D	0%	0

DISCUSSION

Component loosening due to osteolysis is one of the major problems associated with Total hip arthroplasty. This results in reduced rates of survival of total hip components. With improved cementing techniques, it has been seen that cemented femoral acetabular fixation has provided durable results. However, acetabular component fixation showed loss of fixation in a number of cases after 10 years. The present study was a series of 20 hips operated for a period with total hip arthroplasty for various disorders of hip.

While our study was limited to 20 T.H.A., Berger et al,[5] performed 150 T.H.A., Harris et al,[6] performed 126 T.H.A. and Goldberg et al,[7] performed 125 T.H.A. This is due to the fact that this study was limited to a very short duration. Also, financial constraints and unawareness of this procedure to the patient limited number of patients for this study. The age limit for this series was up to 67years. Callagan et al,[8] performed primary hybrid THA in 131 consecutive, non-selected hips in 118 patients of primary osteoarthritis. Follow up was performed at 8-9 years after the procedure. The average age at the time of procedure was 68 years Davis et al.[9] The average follow up was for 31 months and the average age of the patients was 55 years. Many series have shown that the rate of loosening and revision of total hip arthroplasty is high in younger patients. The cemented acetabular component has been the source of most of these failures. The short-term results of the cementless acetabular reconstruction have been encouraging in young patients. Berger et al reported a 10-year survival of 98.8% in patients younger than 50 years.

Most common diagnosis in the present series was avascular necrosis (35%) followed by osteoarthritis both primary and secondary (30%). There were 3 hips of failed hemiarthroplasty, 2 hips of neglected fracture neck of femur, 2 hips of ankylosing spondylitis. Studies in the west report Osteoarthritis as the most common diagnosis is 63% by Harris et al,[6] and 77% by Berger et al.[5] Avascular necrosis is the second most common diagnosis in the western literature is 10% by Harris et al,[6] & 7% by Berger et al.[7] The initial diagnosis was osteoarthritis in 21 hips, CDH in 11 hips, avascular necrosis in 8 hips and rheumatoid arthritis in 7 hips. 2 Hips had slipped capital femoral epiphysis, one, Legg Perthes disease, one Paget's disease and one, prior poliomyelitis. In this series, the difference in diagnosis might suggest a high rate of A.V.N. and a low rate of osteoarthritis in Indian patients. A study for longer period of time and with longer follow up is needed to establish this fact and to determine the reason for this difference.

Chemoprophylaxis was routinely carried out in all patients. No patient developed deep infection and only one case of superficial infection was detected. All surgeries were performed in modular operating theatre. Wilson et al,[10] reported a significant fall in the infection rates when prophylactic antibiotics were used from 11% to 1%. Goldberg et al,[7] reported a rate of 0.8% of deep infection using vertical laminar flow operating rooms and body exhaust systems. No case of deep infection in the present study highlights the importance of modular operating room discipline along with prophylactic antibiotics can significantly reduce infection rates.

Patients were evaluated after discharge at 4 weeks, 2 months, 6 months, 8 months, 1 year, and then yearly. Average follow up was 10 months in this study, as compared to much larger follow ups available in western literature is 42 months by Harris et al,[6] 8.6 years by Goldberg et al,[7] and 103 months by Berger et al.[5] Mean Harris hip score improved from 35.88 points preoperatively to 91.05 points postoperatively. 70% of hip were graded as excellent, 24% were graded as good and 6% were graded as fair in this study. Harris et al reported improvement in Harris hip

score from 57 preoperatively to 93 points postoperatively. 96% good to excellent results, 4% fair and no poor results were reported. Goldberg et al reported improvement in Harris hip score from 47 preoperatively to 88 points postoperatively. 85% good to excellent results, 13% fair and 9% poor results obtained in his series. A clinical and roentgenographic study was done on 52 primary total hip arthroplasties by Davis et al,[9] and Harris et al.[6] 50 hips were classified as good or excellent, one as fair and one as a poor result. No total hips components required revision.

Woolson and Haber,[11] did a retrospective study on 114 hips operated using hybrid prosthesis. The average hip score improved from 47 points pre operatively to 97 points. Post operatively 4 hips (3%). These figures were comparable to our results.

Pain relief was also dramatic following THR. 59% of the patients had marked pain preoperatively and 41% had moderate pain. Postoperatively 94% of patients were relieved of pain only 6% patients had mild pain. Similar result was obtained by Harris et al (98% complete pain relief) and Berger et al (94.5% complete pain relief). Davey and Harris, Postoperative pain was none or slight in 49 hips and mild pain in other 3 patients. No patient complained of mid-thigh pain.

Limp was present in 100% of patients preoperatively. No limp is seen in 60% of patients in this study, slight limp was present in 40% of patients. In a study by Harris 63% patients had no limp and 28% of patients had slight limp. Berger et al,[5] also reported low rate of limping. The limping improves over a period of time with progressive abductor exercises. As this study has a follow up of 10 months, percentages of patients limping are expected to decrease with time. 94% patients needed support preoperatively, among them 47% need occasional support, 53% patients does not need any support postoperatively. This finding is comparable to the results comparable to the results obtained by Harris et al,[6] (95% patients used cane occasionally). Davis et al,[9] study shows, thirty-one patients (35 hips) walked without limp and 12 patients (12 hips) walked with a slight limp. Five patients (5 hips) had a moderate limp.

Radiographically results were also excellent. Second generation cementing techniques were used. Grading the initial appearance cement mantle columns resulted in 58% hips with Grade A, 25% with Grade B, 8.5% with Grade C1, and 8.5% with Grade C2 cementing technique. This result was comparable to results by Berger et al,[5] (41% hips with Grade A, 24% with Grade B, 7% with Grade C1, and 27% with Grade C2 and 1% Grade D cementing technique). No hip showed any evidence of loosening or osteolysis in femoral and acetabular component. One hip had anterior dislocation postoperatively, one patient had DVT. In series by Harris et al,[6] no femoral component as definite or probably loose and one acetabular component showed migration. Goldberg et al,[7] reported revision of one acetabular component for recurrent dislocation (0.8%) and one stem revision for mechanical loosening, one stem radiographically loose. However as our study has very short follow up, definite conclusions can only be drawn after longer follow up.

Low complications were seen in our series. 1 anterior dislocation, 1 DVT, 1 hip with lengthening of 1cm and 1 superficial infection were seen. Harris et al reported 5 cases of trochanteric non-union (8%), 19 cases of deep vein thrombosis (15%), 9 dislocation (7%), 2 partial femoral and sciatic nerve paralysis and 2 patients had peroneal nerve paralysis (1.5% each). Goldberg et al,[7] had 3 dislocations (2.4%), 1 deep infection (0.8%) and 3 deep vein thrombosis (2.4%). Davey and Harris study shows the incidence of heterotypic bone was 43% (22 hips) complication from surgery included eight cases of deep vein thrombosis, one sciatic nerve and two peroneal nerve palsies and four post-operative dislocations. Wixon, Stulburg and Mehlhoff,[13] study shows two uncemented stems had aseptic loosening, one was revised. Pain in the thigh occurred in 24% of uncemented stems at one year, the prevalence of pain then declined. The incidence of migration of the components and of radiolucent lines was greater in the acetabulum that had a cemented component that in those that had cup allowing in growth of bone. Callagan et al,[8] had one patient with bilateral THA and one with unilateral THA were dissatisfied due to recurrent dislocation. The femoral component had been revised for aseptic loosening in 8 hips (6.1%) one additional hip showed definite radiographic loosening. No acetabular component had been revised for aseptic loosening and no acetabular component had migrated.

In our study of 20 hips clinical and radiographical results were evaluated between cemented, uncemented and hybrid prosthesis. Mean Harris hip score post operatively for uncemented 94.2, cemented 89 and hybrid 93 points. No pain was present in hybrid prosthesis, 66% mild moderate pain in uncemented prosthesis. Wixon, Stulburg and Mehlhoff,[13] performed a comparison of clinical and radiographic results with cemented, uncemented and hybrid prosthesis performed on 144 hips in 1991. The overall clinical results were similar for the three groups. For the 52 hips that have cemented prosthesis, the mean total Harris hip rating was 91 points and the score for pain. 42 points, for 27 patients that had a hybrid prosthesis, 90 and 43 points and for the sixty-five hips that had an implant allowing in growth of bone in both acetabulum and femur, 95 and 43 points. The higher mean Harris hip score in uncemented prosthesis was attributed to younger age of patients and lower number of patients who had another concomitant cause of disability. Two uncemented stems had aseptic loosening, one was revised.

In our study both cemented and uncemented prosthesis are equally beneficial in non-traumatic conditions. Sandesh Reddy Yaratapalli et al,[14] analysed functional and radiological outcome of total hip arthroplasty done for non-traumatic indications.

31 patients who had 38 cemented (or) uncemented hip prosthesis were followed retrospectively and prospectively for 5-13 yrs. A cemented prosthesis was used in men older than 60 yrs and women older than 55yrs and in younger patients in whom adequate initial fixation could not be obtained without cement. Uncemented implants were used in all other patients. We used the Harris hip score (Modified) for clinical and functional evaluation and plain x-ray pelvis with both hips and proximal femur - AP view and x- ray of the operated hip -lateral view for radiological evaluation. All the patients were followed up at Immediate Post-OP, 6wks, 3mths, 6mths, 1 year and annually thereafter. The mean HHS at latest follow up of both cemented and uncemented THR was 88 and 89 respectively. On analyzing the difference in pre op and latest HHS for various non-traumatic indications, our study showed that the results were better in patients with AVN followed by OA and RA. In our series of Uncemented THR s we have 95% excellent/good results while in case of cemented THR s we have 82% excellent/good results. The Harris hip score is a very useful scoring system in assessing total hip replacement done for non-traumatic indications and showed high validity and reliability. The results in patients with avascular necrosis and osteoarthritis were significantly better than those with rheumatoid arthritis. Uncemented and cemented THR give equally good results in non-traumatic indications.

In our study of 20 hips one hip had dislocation, two hips with varus alignment, two hips with valgus alignment; one hip had lengthening of 1 cm. These are the complications we encountered while doing surgery manually. The study of Robotic- Arm Assisted Surgery in Total Hip Arthroplasty, reduces complications following total hip arthroplasty (THA), such as dislocation, component loosening and wear, continue to be common indications for revision surgery. Multiple studies have attributed some of these problems to poor acetabular cup alignment and placement outside of the purported radiographic safe zone. In addition, it has been shown that conventional manually performed acetabular cup placement may not lead to optimal alignment, regardless of surgical experience. Additionally, incorrect leg length and offset can lead to dissatisfaction and instability. Therefore, robotic-arm assisted surgery has been introduced to improve accuracy of cup placement and leg length, and to offset with the aim of reducing the risk of hip instability and improving satisfaction after primary THA. Our aim was to prospectively review the use of robotic-arm assisted surgery in 224 patients and to assess whether the pre- operatively determined radiographic targets were achieved post-operatively and the proportion of acetabular cups outside of the safe zone. Pre-determined anteversion and inclination were 15 and 40 degrees, respectively. Our results have shown that the use of robotic-arm assisted surgery resulted in a post-operative mean inclination of 40 degrees (range, 34 to 51 degrees) and a mean anteversion of 16 degrees (range, 9 to 25 degrees). Ninety-nine percent of the patients remained within the pre- designated safe zone. Evidence has shown that robotic-arm assisted surgery may have improved accuracy in cup placement when compared to conventional surgery and possibly to computer-assisted surgery. When compared to the literature on robotic-arm assisted surgery, our results were comparable. We believe that this surgical technique may aid in reducing post-operative THA complications, such as aseptic loosening and dislocations, but further prospective studies are needed to evaluate clinical outcomes and long-term results.

In our study of 20 hips acetabular cup alignment is made and assessed by the TAL with an angulation of 45o abduction and 15o antiversion. It has recently been reported that the transverse acetabular ligament (TAL) is helpful in determining the position of the acetabular component in total hip replacement (THR). In their study they used a computer-assisted navigation system to determine whether the TAL is useful as a landmark in THR. The study was carried out in 121 consecutive patients undergoing primary THR (134 hips), including 67 dysplastic hips (50%). There were 26 men (29 hips) and 95 women (105 hips) with a mean age of 60.2 years (17 to 82) at the time of operation. After identification of the TAL, its anteversion was measured intra- operatively by aligning the inferomedial rim of the trial acetabular component with the TAL using computer-assisted navigation. The TAL was identified in 112 hips (83.6%). Intra-observer reproducibility in the measurement of anteversion of the TAL was high, but inter-observer reproducibility was moderate. Each surgeon was able to align the trial component according to the target value of the angle of anteversion of the TAL, but it was clear that methods may differ among surgeons. Of the measurements of the angle of anteversion of the TAL, 5.4% (6 of 112 hips) were outliers from the safe zone. In summary, we found that the TAL is useful as a landmark when implanting the acetabular component within the safe zone in almost all hips, and to prevent it being implanted in retroversion in all hips, including dysplastic hips. However, as anteversion of the TAL may be excessive in a few hips, it is advisable to pay attention to individual variations, particularly in those with severe posterior pelvic tilt.

We encountered the lengthening of one hip in our study of 20 hips. Leg length discrepancy following total hip replacement (THR) can contribute to poor hip function. Abnormal gait, pain, neurological disturbance and patient dissatisfaction have all been described as a result of leg length inequality after THR. The purpose of their study was to determine whether the use of computer navigation in THR can improve limb length restoration and early clinical outcomes. They performed a matched-pair study comparing 48 computer-assisted THR with 48 THRs performed using a traditional freehand alignment method. The same implant with a straight non-

modular femoral stem was used in all cases. The navigation system used allowed the surgeon to monitor both acetabular cup placement and all the phases of femoral stem implantation including rasping. Patients were matched for age, sex, arthritis level, pre-operative diagnosis and pre-operative leg length discrepancy. At a minimum follow-up of six months, limb length discrepancy was measured using digital radiographs and a standardized protocol. The number of patients with a residual discrepancy of 10 mm or more and/or a post-operative over-lengthening were measured. The clinical outcome was evaluated using both the Harris Hip Score and the normalized Western Ontario and McMaster Universities (WOMAC) Arthritis Index.[15] Restoration of limb length was significantly better in the computer-assisted THR group. The number of patients with a residual limb length discrepancy greater than 10 mm and/or a post-operative over-lengthening was significantly lower. No significant difference in the Harris Hip Score or normalised WOMAC Arthritis Index was seen between the two groups. The surgical time was significantly longer in the computer-assisted THR group. No post-operative dislocations were seen.

CONCLUSION

We have done an evaluation of Total Hip Arthroplasty using cemented femoral and cemented acetabular components, uncemented, hybrid total hip replacement. We have operated 20 hips in 17 patients for avascular necrosis (7 hips), fracture neck of femur (2 hips), ankylosing spondylitis (2 hips), osteoarthritis (6 hips), and failed hemiarthroplasty (3hips). In all patients Harris hip score was used to evaluate the patient. Patients were started on progressive weight bearing after removal of negative suction drain on 2nd post-operative day. Excellent results were obtained in 70% of patients, good result were obtained in 24% of patients postoperatively according to Harris hip score. No radiological loosening was seen in femoral or acetabular component. Hence this study provides an evidence modality of treatment for various disorders of hip. However, because of short period of study and less number of subject's longer study is required to make definitive conclusions. At present it can be concluded that in properly selected cases, THA offers a good procedure currently available for hip joint pathologies in selected patients. The Harris Hip Score significantly improved in these patients.

Pit Falls

Dislocation of the hip joint.
Avoid the post infections.
Elderly patients should be cemented.
Avoid cementing in younger patients.

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