Total hip replacement in difficult acetabulum planning and management

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Background
Total hip replacement improves pain and quality of life in people with hip arthritis. Total hip replacement is a successful orthopedic procedure. Dysplastic or difficult acetabulum is a general definition that means abnormal hip socket that leads to uncoverage of the head femur and excessive pressure on the rim of the hip socket including many diagnoses as aseptic loosening, acetabular protrusion, neglected developmental hip dysplasia, posttraumatic acetabular malunion or advanced osteoarthritis and revision of failed hemi/total arthroplasty, etc…

Aim
To plan and manage difficult acetabulum component in THA and to evaluate the clinical and radiological outcomes of these patients with different diagnoses.

Patients and methods
Twenty cases were enrolled in this investigation.

Results
The duration of hospitalization varied from 2 to 5 days, with a mean of 2.95 ± 0.921 days. The return to exercise varied from 2 to 5 months, with a mean of 3.38 ± 0.865 weeks. A statistically significant difference (P=0.0002) between patient satisfaction and leg length discrepancy indicates that the equal group is more satisfied.

Conclusion
In the treatment of problematic acetabulum components in THA, cementless components are effective and a viable therapeutic choice. The strategy related to shorter hospital stays and a speedy return to normal activity. Further comparison researches with bigger sample sizes and longer follow-up periods are required to corroborate our findings and uncover adverse event risk factors.

Keywords:
hip arthroplasty, lateral approach, total hip replacement

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Introduction

Total hip replacement (THR) has been found to give great pain relief and increased quality of life for people with severe hip arthritis. Total hip arthroplasty (THA) is one of the most effective orthopedic surgeries performed today [1].

Fractures of the acetabulum are severe injuries that can result in gradual impairment of hip function. Unfortunately, many individuals with acetabulum fractures continue to suffer from posttraumatic arthritis. Even when near-anatomic reductions are obtained, the reported incidence of posttraumatic arthritis ranges between 27 and 37% [2], with the incidence of future THA being between 8 and 23% [2].

Developmental hip dysplasia (DDH) is a frequent cause of secondary hip osteoarthritis (OA). Despite the existence of newborn screening programs, some instances are overlooked or improperly treated. These individuals eventually develop secondary OA and require THA at an earlier age. Because of the altered architecture of dysplastic hips, THA in dysplastic hips is frequently subpar [3].

Protrusio, the idiopathic central displacement of the femoral head inside the acetabulum, is a very uncommon condition. On occasion, it may be observed in arthritic hips caused by rheumatoid arthritis, ankylosing spondylitis, prior trauma, osteomalacia, or Paget's disease [4]. In such cases, primary total hip replacement (THR) may be technically challenging due to accompanying considerable medial and proximal migration of the joint center, insufficient bone medially,

and limited bony support to the acetabular component on the periphery.

Conversion of a failed hemiarthroplasty to a THR is a difficulty in orthopedics. As only one side of the hip joint is rebuilt, hemiarthroplasty is a less invasive technique that preserves bone stock for future THR surgeries. On failure of these treatments, a THR is advised, although the influence of these implants on the operational procedures and long-term results of a later THR have been debated and are not well understood [5].

The purpose of this study was to design and manage challenging acetabulum components in THA and to assess the clinical and radiological outcomes of these patients.

Patients and methods

Twenty-one instances were subject to a prospective research. The participants in this study received comprehensive counseling, and informed consent was acquired. After surgery, all patients were followed for at least 6 months. Ethical approval from the ethical committee in our University Hospitals was obtained.

Our study included patients who were at least 20 years old who had recent or ignored acetabular fractures, malunion acetabular fractures, severe posttraumatic OA of the hip joints, hip protrusio, neglected DDH, ankylosed hip, failed osteosynthesis/bipolar, and rheumatoid arthritis.

This research excluded patients with pathological fractures, neurovascular damage, and septic arthritis.

Every patient received a comprehensive preoperative history and evaluation, including a clinical and radiological (radiograph but computed tomography scan in selected cases) examination and standard tests, as well as a postoperative clinical and radiological evaluation. Revision surgery on the acetabular side is difficult, particularly when there is bone stock loss.

To facilitate the choice of acetabular reconstruction, a classification of the defect is necessary. Although several classification schemes are available, the authors have proposed a simple practical classification based on radiographs and intraoperative findings.

Defects are classified as contained cavitary (type 1), noncontained defects are further split into type 2A or type 2B based on whether the allograft supports less than or more than 50% of the cup [6].

All patients of type 1 did not need graft (eight patients) six of them were treated by totally cementless hip replacement and two treated by totally cemented.

All patients of type 1 did medialization of acetabulum.

Seven patients with type 2A, five of them received graft and two did not need graft using mesh and modification of cup and head sizes. Four patients were treated by totally cementless hip replacement and three patients were treated by cemented cup on cementless stem THR. Adductor tenotomy and anterior capsule release were done in selected cases with limited abduction.

Six patients of type 2B, four of them received bone graft and two did not by using Muller ring or Schneider ring. One patient treated by high hip center technique. Two patients were treated by totally cementless hip replacement, three patients were treated by cemented cup on cementless stem THR and one patient was treated by totally cemented THR. Adductor tenotomy and anterior capsule release were done in selected cases with limited abduction.

Allografts were taken from bone bank in the form of femoral heads. Different types used; tricortical corticocancellous fixed by two screws for superior defects or morselized bone graft by impaction bone graft in the acetabulum bed.

Diagnoses in the form of five patients aseptic loosening, four patients neglected Perthes disease with shallow acetabulum, three patients advanced OA with avascular necrosis (AVN), three cases with neglected DDH, one patient with advanced OA, one patient with ankylosed hip, one patient with AVN with shallow acetabulum, one patient with fibrous dysplasia, one patient with malunion acetabular fracture, and one patient with neglected acetabular fracture. Each diagnosis was dealt with according to its classification.

Every patient will be given an explanation of the process and informed consent will be obtained before the operation. Antibiotic prophylaxis in the form of 1 g ceftriaxone was delivered 1 h before the skin incision and continued for 24 h after surgery [7]. Before surgery, leg lengths should be evaluated to assess leg length disparity.

All patients received spinal anesthesia and were positioned laterally on a typical operating table. Single skin preparation was performed using a sterile sponge stick and iodine antiseptic solutions in one direction before sterile drape was applied. All patients had a lateral approach. The skin incision is a distally parallel,

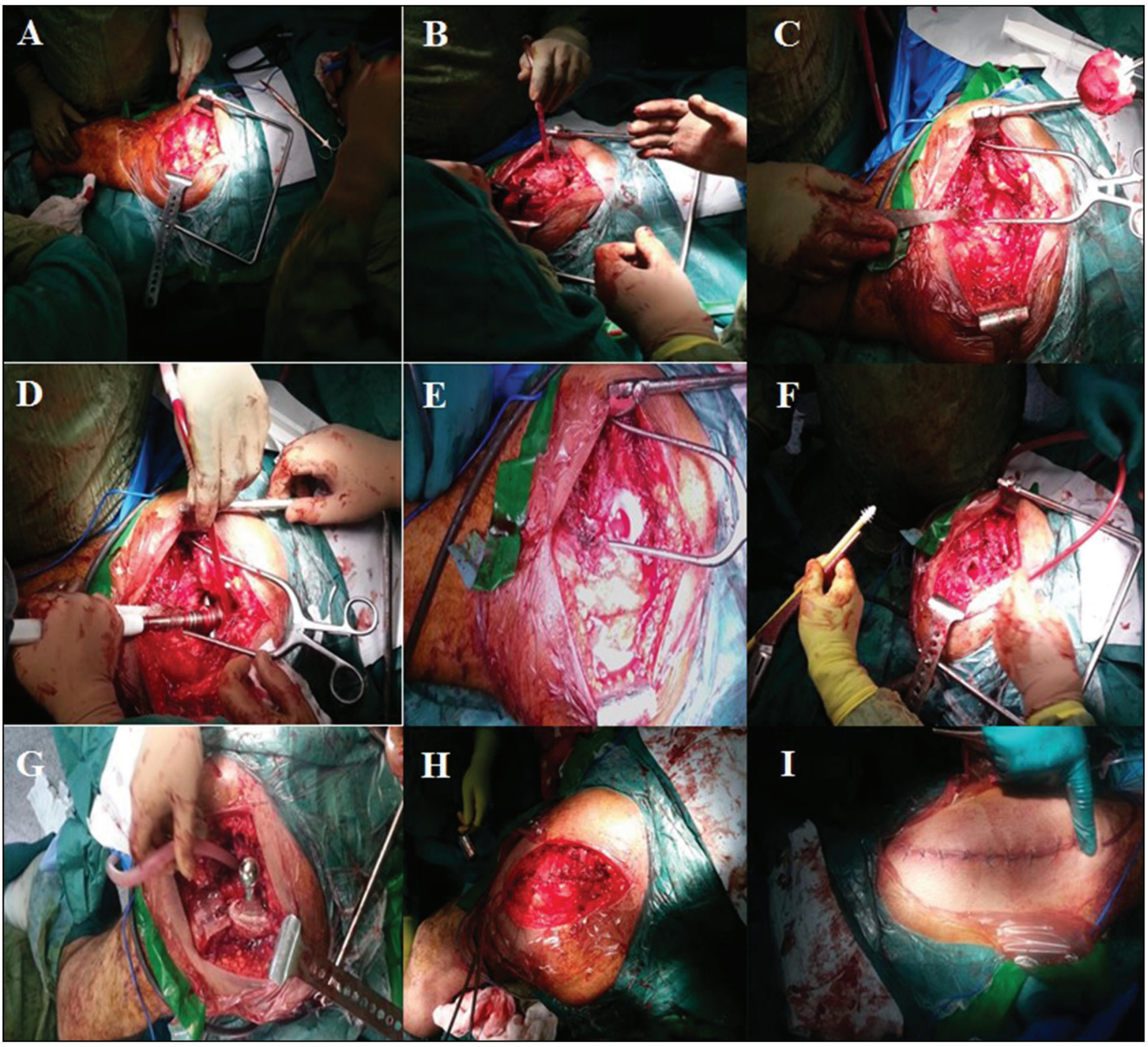
posteriorly oriented lazy-J incision centered on the greater trochanter. The gluteus medius and vastus lateralis are exposed by splitting the fascia lata above the center of the greater trochanter and parallel to the skin incision superiorly/inferiorly, and then retracting the anterior and posterior fascial flaps (Fig. 1).

Deep exposure is achieved by incising the gluteus medius above the center of the trochanter and extending superiorly; the vastus lateralis is also divided at its insertion at the greater trochanter and continued distally; this exposes the joint capsule underneath. T-shaped capsulotomy was performed, followed by osteotomy of the femoral neck and head extraction (in cases of nonunited fracture femoral neck the head is extracted then osteotomy of the remaining neck is done).

Excision of the labrum and any excess soft tissues that may be pulled into the acetabulum during insertion of the prosthesis. The acetabulum was prepared using motorized reamers; a smaller reamer was used first, followed by successively bigger reamers; and periodic checks of the depth of reaming were performed to ensure that the medial wall was not compromised.

Preparing acetabulum defects was dealt with according classification. Bone grafts, augments, mesh, or a mix of these were used to repair acetabular defects. All patients with type 1 did medialization of acetabulum without using bone graft. Seven patients of type 2A, five of them received graft and two did not need graft. Mesh and modification of cup and head size were sufficient for these two patients. Adductor tenotomy and anterior capsule release were done in selected cases with limited abduction.

Figure 1



Steps of the operation. A,B & C : Layers of exposure. D: reaming of acetabulum. E: Acetabulum was cemented. F: insertion of cement plug. G: Femoral prosthesis was cemented. H & I: Layers of wound closure.

Six patients of type 2B, four of them received bone graft and two did not need graft. Muller ring or Schneider ring was sufficient for these two patients. One patient treated by high hip center technique. Adductor tenotomy and anterior capsule release were done in selected cases with limited abduction.

Trial component was used to evaluate the fit and bony coverage of the cup when placed in the optimal position with an inclination of 40–45° and 20° of anteversion, followed by drilling multiple 6-mm holes through the subchondral bone plate of the ilium and ischium for cement intrusion. After applying cement and implanting the acetabular cup in the appropriate place, a ball-type pusher was introduced into the socket to maintain pressure on the implant while the cement cures. The cementless cup was secured to the acetabular wall with two or three screws. Cups were applied using press fit fixation.

After implantation of the acetabular component, the femoral canal was prepared using reamers of several sizes, followed by rinsing with saline and the removal of any bone debris.

Trial femoral component was utilized to execute a trial reduction in order to measure limb length, range of motion, and arthroplasty stability. When the final femoral component size, limb length, and stability have been determined, the hip is dislocated and the trial components are removed, followed by plug insertion in the appropriate position to allow cement pressurization and prevent cement extrusion distally into the femoral diaphysis. The femoral stem was implanted and mild, constant hand pressure was provided with the version controlled by an inserter, followed by the installation of the appropriate-sized head piece. In femoral diaphysis, a mild pressfit was used to implant a stem without cement.

The acetabulum was cleared of all material, and reduction of the hip was performed. A functional range of motion was utilized to confirm the stability of the hip. The gluteus medius and vastus lateralis were given specific attention during soft tissue repair, which was followed by closure of the subcutaneous layer and skin closure using interrupted sutures.

Postoperative analgesia will be administered in the form of intravenous ketorolac 30 mg every 12 h for a maximum of 3 days, patient controlled analgesia when necessary in selected patients, one dose ceftriaxone 1 g i.v. after 24 h, patients will receive low-molecular-weight heparin subcutaneously per day beginning 12 h after the procedure every 24 h during hospitalization, hemoglobin level was measured to determine the need for postoperative blood transfusion.

On the first postoperative day, the patient was permitted to sit on the side of the bed or in a chair in a semi-recumbent position with one or two pillows in the seat to prevent excessive flexion; an oral antibiotic was prescribed upon discharge in the form of ciprofloxacin 500 mg twice daily for 1 week. Typically, gait training was begun on the first postoperative day using a walker for balance and then was graduated to crutches a few days later.

When the patient's strength and balance allowed, crutches were eliminated usually after 2 weeks and he or she was taught to use a cane. A cane was utilized until the discomfort and limp have subsided. Following surgery, patients were instructed to utilize a raised toilet seat for the first 6 weeks.

At 2 weeks, 6 weeks, 3 months, and 6 months, patients were examined. At each visit, the following was evaluated: general health and patient condition, wound healing, and evidence of surgical site infection. Suture removal was done 2 weeks after surgery.

Examination of outcome was performed 2 weeks postoperatively using the modified Harris hip score (MHHS) to determine each patient's functional ability, followed by a final evaluation 6 months later using the same score to determine each patient's final functional ability.

The clinical outcomes: according to the MHHS system [8], scores more than 90 were deemed exceptional, scores between 81 and 90 were deemed good, scores between 71 and 80 were deemed acceptable, and scores 70 were deemed inadequate. Fair and bad scores were deemed unacceptable, whereas excellent and good results were deemed satisfactory [9].

Radiography was used for radiological evaluation of cup position, inclination, and anteversion, stem location in the femur, bone cement, and complications such as osteolysis and loosening.

Statistical analysis of the data [10]

Data were entered into the computer and analyzed using version 20.0 of the IBM SPSS software suite (IBM Corporation, Armonk, New York, USA) Qualitative data were described using number and percent. The Kolmogorov–Smirnov test was performed to determine the distribution's normality. Range (minimum and maximum), mean, and SD were used to characterize quantitative data. At the 5% significance threshold, the

acquired findings were deemed significant [11]. If less than or equal to 0.05 is considered significant, 0.05 is considered inconsequential, and less than or equal to 0.01 is considered extremely significant.

Results

The study was conducted initially on 27 individuals; four rejected participation, and two were lost to follow-up. Twenty-one patients were finally included.

A statistically significant difference existed between preoperative and postoperative values (P<0.001). At preoperative time it was ranged between 0 and 57 with a mean value of 23.95 ± 15.263 and it was increased significantly to be at postoperative time with a mean value of 79.05 ± 12.167 showing that postoperative results were better. Table 1 shows MHHS of the studied group.

There was a statistically significant difference between patients who were dissatisfied and those who were satisfied, with P value of 0.00001 indicating that the main group was more satisfied. Table 2 displays the relationship between patient satisfaction and primary versus revision care.

There was a statistically significant difference between entirely cementless, totally cemented, and cemented cup on cementless stem in both satisfied (P<0.001) and unsatisfied (P<0.05) patients, with totally cementless demonstrating greater patient satisfaction. The correlation between patient happiness and cement is seen in Table 3.

There was a statistically significant difference between the leg length discrepancy of satisfied patients (P=0.0002), indicating that the equal group was more satisfied. Table 4 illustrates the correlation between postoperative patient satisfaction and leg length disparity.

There was statistically significant difference between nonsatisfaction patients and satisfaction patients where P value of 0.00001 showing higher satisfaction in the primary group as shown in Table 5.

This case was male patient 39-year-old driver.

Diagnosis

Neglected acetabular fracture with posterior hip dislocation; patient was fixed by two screws after reduction of hip joint; patient was dislocated during transportation; patient was neglected for 6 weeks; THR with high hip center technique performed; patient returned to activity after 3 months.

Table 1 Relation between modified Harris hip score of the studied group

	Preoperative	Postoperative	*t*	*P* value
Range	0–57	48–94	15.346	<0.001
Mean±SD	23.95 ± 15.263	79.05 ± 12.167		

t, Student paired *t* test.

Table 2 Relation between patient's satisfactions and primary versus revision

Satisfaction	Satisfaction		*P* value
	Primary	Revision	
Unsatisfactory			
n (%)	3 (42.9)	4 (57.1)	0.592
Satisfactory			
n (%)	13 (92.9)	1 (7.1)	0.00001

Table 3 Relation between patient's satisfactions and cement

Satisfaction	Cement			*P* value
	Totally cementless	Totally cemented	Cemented cup on cementless stem	
Unsatisfactory				
n (%)	2 (28.57)	0	5 (71.43)	<0.05
Satisfactory				
n (%)	10 (71.43)	3 (21.43)	1 (7.14)	<0.001

Table 4 Relation between patient's satisfactions and leg length discrepancy postoperatively

Satisfaction	<2 cm	≥2 cm	Equal	χ^2	*P* value
Unsatisfactory					
n (%)	2 (28.6)	1 (14.28)	4 (57.1)	3	0.223
Satisfactory					
n (%)	5 (35.7)	0	9 (64.3)	16.525	0.0002

Table 5 Relation between patient's satisfactions and primary versus revision

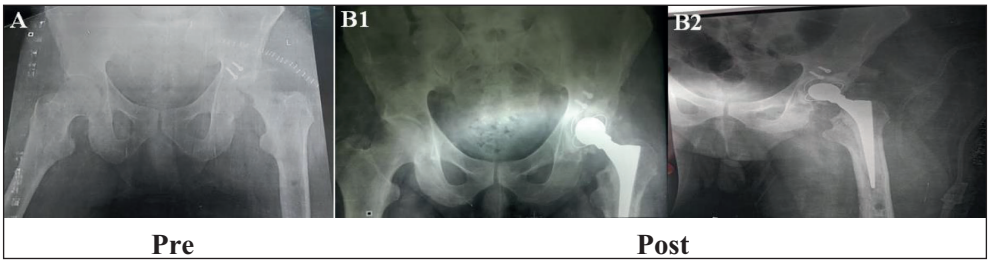
Satisfaction	Satisfaction		*P* value
	Primary	Revision	
Unsatisfactory			
n (%)	3 (42.9)	4 (57.1)	0.592
Satisfactory			
n (%)	13 (92.9)	1 (7.1)	0.00001

Classification

2B, MHHS: excellent

Pain	0	44
Limping	0	8
Support	0	11
Distance walked	0	11
Stairs	0	4
Squatting	0	2
Sitting cross-legged	0	3
Public transportation	0	1
Range of motion scale	0	4
Absence of deformity	0	4

Pre: 0, Post: 92.



Discussion

Initial open reduction and internal fixation (ORIF) of acetabular fractures may improve later THA by restoring bony landmarks and hip center. However, after ORIF, the arthroplasty surgeon may encounter complications such as significant soft tissue scarring, heterotopic ossification, retained internal devices, and persistent bone defects [12]. THA following nonoperatively treated acetabular fractures, on the other hand, has considerable challenges, since patients frequently arrive with a high hip center, acetabular protrusion, acetabular bone abnormalities, and/or nonunion.

Both cemented and uncemented acetabular components have been utilized to treat OA following postacetabular fracture [13,14]. Recent developments in uncemented acetabular fixation have improved the radiographic and functional characteristics of THA in patients with acetabular fractures [15].

Acute THA following acetabular fractures offers the advantage of rapid postoperative weight bearing, hence reducing the risk of thromboembolic events, decubitus ulcers, and pulmonary problems in these patients [16].

THA is a demanding technique and the gold standard therapy for failed acetabular fractures. The difficulty of the process is determined by the fracture pattern and the first treatment of the fracture. This study's primary objective was to design and treat problematic acetabulum components in THA and to assess the clinical and radiological outcomes of these patients.

Twenty-one patients who received THR participated in this prospective cross-sectional research.

Age varied from 23 to 60 years, with a mean of 36.71 ± 11.799 years, according to the current study's demographic data for the examined sample. Nine (42.9%) male cases compared with 12 (57.1%) female cases. The BMI varied from 27.75 to 36.46 kg/m^2, with a mean of 32.25 ± 2.86 kg/m^2. Roughly half of the patients evaluated were housewives (47.6%), and about a quarter were smokers. Comorbidity revealed that one (4.8%) had hypertension, one (4.8%) had diabetes mellitus, and one (4.8%) had hepatitis C virus.

Kumar *et al*. [17] assessed the clinical, radiological, and postoperative complications as well as functional result and quality of life following THA in patients with failed ORIF of acetabular fractures. This study is corroborated by their findings. Fourteen (77.8%) of the study's 18 participants were male, while the remaining four (22.2%) were female. Patients varied in age from 20 to 68 years, with a mean age of 44.7 years. The study revealed a correlation between older age and lower result.

In addition, Wang *et al*. [18] intended to assess the impact of fracture treatment type and advanced ceramic bearing on the clinical results of delayed THA. The research included 33 patients (33 hips) with failed acetabular fractures who had cementless THA. The mean age was 45.1 ± 9.3 years, and there were 21 men and 12 females in the sample.

In addition, El-Bakoury *et al*. [19] sought to analyze patient-reported outcome measures for patients who received delayed uncemented acetabular THA following acetabular fractures. In addition, evaluated the radiological result and incidence of related problems in these individuals. Following unsuccessful treatment of acetabular fractures, 40 patients received cementless acetabular THA. The average age at THA ranged from 21 to 77 years.

In addition, Moon *et al*. [20] sought to assess the clinical and radiological outcomes of patients who had undergone THA for acetabular fracture. There were 37 patients registered. The mean age was 56.2 (24–81) years and there were 27 men and 10 women in the sample.

Regarding the group's MHHS. A statistically significant distinction existed between preoperative and postoperative (P=0.001). At preoperative evaluation, it varied from 0 to 57 with a mean value of 23.95 ± 15.263; at postoperative evaluation, it climbed

dramatically to reach 79.05 ± 12.167, indicating that postoperative outcomes were superior.

This was corroborated by Kumar *et al.* [17], who found that the postoperative MHHS varied from 82 to 95, with a mean of 89.72 ± 4.24. Eleven (61.1%) of the 18 instances returned with an exceptional outcome, while the remaining seven (38.9%) returned with a good outcome, according to the HHS criterion. In addition, Moon *et al.* [20] observed that the preoperative mean HHS of 42.5 increased dramatically to 83.5 at the end follow-up (P=0.05). In addition, Salama *et al.* [21] found that the average HHS went from 38 (range, 0–70) to 92 (range, 19–100), and at the most recent follow-up, 13 (62%) patients had an exceptional HHS, five (24%) had a good HHS, and three (14%) had a fair score.

In addition, Wang *et al*. [18] evaluated 33 patients (33 hips) with failed acetabular fractures who had cementless THA. Twenty-one were first treated with ORIF, whereas 12 were treated with non-ORIF. The investigation revealed that HHS improved dramatically in both groups with equivalent outcomes. In a comprehensive study by Stibolt *et al.* [22], stated that the mean HHS for 448 patients with acetabular fractures increased from 41.5 preoperatively to 87.6 at 4–20 years follow up.

Five (23.8%) patients were diagnosed with aseptic loosening, four (19.0%) patients were diagnosed with neglected Perthes disease, three (14.3%) patients were diagnosed with advanced OA with AVN, three (14.3%) patients were diagnosed with neglected DDH, one (4.8%) patient was diagnosed with advanced OA, one (4.8%) patient was diagnosed with ankylosed hip, one (4.8%) patient was diagnosed with AVN with shallow acetabulum, one (4.8%) patient was diagnosed as fibrous dysplasia, one (4.8%) patient was diagnosed as malunion acetabular fracture, and one (4.8%) patient was diagnosed as neglected acetabular fracture.

The current analysis found that of the analyzed cohort, 16 (76.2%) were primary and five (23.8%) were revisions.

According to the research [17,18], all patients had primary THA.

Regarding the distribution of grafts among the analyzed group, the current investigation revealed that nine (42.9%) individuals had received a transplant.

El-Bakoury *et al*. [19] reported that 27 (67.5%) patients received a bone transplant. As a morselized graft for 21 patients with cavitary defects or as a structural graft for six patients with segmental defects. In addition, the study found that the use of bone transplants had no discernible effect on the functional result.

Regarding the articulating surfaces of the examined group, we discovered that 18 (85.7%) had metal on polyethylene, two (9.5%) had ceramic on polyethylene, and one (4.8%) had a DDH prosthesis.

According to Wang *et al*. [18], joint articulation consisted of either metal-on-polyethylene or ceramic-on-ceramic. In 12 hips, metal-on-polyethylene was used. In addition, El-Bakoury *et al.* [19] reported that the articulation was metal-on-polyethylene in 14 (35%), ceramic-on-ceramic in 19 (47.5%), and ceramic-on-polyethylene in seven (17.5%) cases.

The current investigation revealed that 12 (57.14%) were completely cementless, three (14.28%) were completely cemented, and six (28.6%) had a cemented cup on a cementless stem.

This was consistent with the findings of Kumar *et al.* [17], who stated that they utilized uncemented in 14 (77.8%) and hybrid in four (22.2%) cases. Also, El-Bakoury *et al.* [19] showed that cementless stems were employed in 72.5% of hips, whereas cemented stems were used in 27.5% of hips.

According to Wang *et al*. [18] and Salama *et al.* [21], all patients received cementless THA. It was discovered that cement gives quick, robust implant attachment, leading to rapid pain alleviation. However, there are concerns that cement's fixation degrades with time.

A thorough literature review and meta-analysis compared cemented and uncemented fixation in THA. Overall, there was no difference between the groups in terms of failure (defined as revision). However, subgroup analysis revealed improved survival rates for cemented fixation in trials that included patients of all ages, as opposed to studies that included just younger (55 years old) patients [23].

In addition, Liu *et al*. [24] observed that cemented femoral components were superior to uncemented femoral components in terms of functional results and complication rates. Two recent meta-analyses demonstrated that cemented total hip arthroplasty (CTHA) is at least as effective as uncemented THA (UTHA) [25]. The improvement in HHS with CTHA was significant, especially as fewer early prosthesis adjustments occurred with CTHA compared with UTHA [26]. Although a high complication rate and

poor quality of life were related with UTHA [27], a speedy healing process was seen, with no significant variations in HHSs during the first or second month following operation. Concern exists over the optimal treatment method for femoral fracture due to the rising incidence of complications.

In addition, Morsi *et al*. [28] treated 30 dysplastic hips with complete hip arthroplasty utilizing femoral head autograft shelf repair. Average follow-up duration was 8.1 years (range, 5.2–13.3 years). Only three of the 30 instances had unsuccessful outcomes, for a 90% success rate. All autografts have fused with the host bone. When seen in either cemented or uncemented cups, resorption was minimal and limited to the lateral, nonload-bearing portion of the graft. This study supported reconstructing dysplastic hips during THA with shelf autografts.

Regarding complications, the present study revealed that one (4.8%) had leg length disparity, three (14.28%) had sciatic discomfort, two (9.5%) had impingement, one (4.8%) had DVT, and one (4.8%) had trochanteric bursitis.

El-Bakoury *et al*. [19] demonstrated that 15% of patients had problems. Periprosthetic joint infection was diagnosed in 7.5% of patients. Five percent of individuals had a temporary sciatic nerve damage. In addition, Salama *et al*. [21] demonstrated that 9.5 patients had grade III heterotopic bone formation, which did not influence the patients' activities. There were no indications of loosening or dislocation around the cementless stems.

Our findings revealed that the MHHS of the examined group. There was a statistically significant difference between the preoperative and postoperative groups with respect to 2 cm (P=0.038) and equal (P=0.004). Equal to or less than 2 cm postoperatively yielded superior outcomes. In the 2 cm group, there was no statistically significant difference between preoperative and postoperative leg length disparity; nonetheless, this group still had satisfactory outcomes.

This pact with Woolson *et al*. [29] and Kayani *et al*. [30] after arthroplasty of the hip, leg length disparities are prevalent. The mean limb length discrepancy (LLD) ranges between 1 and 15.9 mm. LLD has been detected in between 6 and 32% of individuals and is always detected when the amount of shortening or lengthening surpasses 10 and 6 mm, respectively.

Our results demonstrated a correlation between patient satisfaction with primary versus revision care, and a statistically significant difference between nonsatisfied patients and satisfied patients (P=0.00001), with the primary group demonstrating greater satisfaction.

Our findings concur with those of Zhang *et al*. [31] who observed that most patients had good radiologic and clinical outcomes, although more follow-up is required to determine long-term outcomes. The patient satisfaction rate achieved 92.3%.

Similarly, our results concur with those of Myncke *et al*. [32] who discovered that patient satisfaction following revision with custom-made triflanged acetabular components implants had not previously been described in the medical literature. In our study, patient satisfaction was good mostly due to decreased pain and enhanced walking abilities. In most cases, however, many revisions resulting in significant soft tissue injury and substantial bone loss precluded favorable outcomes.

Our data revealed a correlation between patient satisfaction and graft, with no statistically significant differences between patients with and without satisfaction.

Comba *et al*. [33] evaluated the outcomes of patients who received revision THA with either only biological graft or a blend of bone graft substitute and biological graft. Our results concur with their findings. The efficacy of bone graft replacements in the therapy of acetabular deformities in THA revisions was demonstrated by our findings, with no significant differences between the groups evaluated.

Our findings revealed a correlation between patient satisfaction and days of hospitalization and return to activity, as well as statistically significant differences between nonsatisfied and satisfied patients, with P=0.025 and 0.012, respectively, indicating that satisfied patients spent fewer days in the hospital. Patients with satisfactory outcomes need less time to resume exercise. Our results demonstrated a correlation between patient satisfaction and articulating surfaces, as well as a statistically significant difference between metal on polyethylene, ceramic on polyethylene, and DDH prostheses in terms of patients who were not satisfied and those who were satisfied (P=0.0004 and 0.001, respectively). The metal on polyethylene group demonstrated more pleasure. Our results revealed a correlation between patient satisfaction and cement, revealing a statistically significant difference between totally cementless, totally cemented, and cemented cup on cementless stem in both satisfied (P<0.001) and

dissatisfied (P<0.005) patients, with totally cementless providing a higher level of satisfaction.

Conclusion

Concerning the relationship between patient satisfaction and cement, our findings indicate that there is a statistically significant difference between cementless, cemented, and cemented cup on cementless stem, with both satisfied and dissatisfied patients reporting greater satisfaction with the cementless option. Therefore, we may conclude that cementless acetabulum components are an effective and realistic treatment option for troublesome acetabulum components in THA. The method was associated with a brief hospital stay and a speedy recovery. Further comparative research with larger sample numbers and longer follow-up is required to substantiate our findings and identify risk factors for negative outcomes.

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Conflicts of interest

There are no conflicts of interest.

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