

Total HIP replacement in Alkhadra Hospital experience and Results

Aiman Bugrara (MD), Faculty of Medicine Gharyan University

S. Bendalla (MD), M. Rashed (MD) Alkhadra Hospital

Faculty of Medicine, Tripoli University

E-mail: abuagrara@gmail.com

Abstract:

Total Hip Replacement Outcomes in Alkhadra Hospital: A Retrospective descriptive epidemiological Study, we reviewed the outcomes of 77 total hip replacements done in Alkhadra Hospital from 1/9/1993 to 1/9/1997 using different types of prostheses and techniques. The mean age of the patients was 55 years and the mean follow-up was four years. The most common complications were cup loosening (8%), hip dislocation (4%), and femoral neck fracture (3%). The mean hospital stay was 29 days. Our results suggest that total hip replacement is a safe and effective procedure for patients with hip arthritis in our setting. The aim of the study was to evaluate the clinical and radiological results, the complications, and the revision rates of the THR **Conclusions:** The study shows that primary total hip replacement can be performed successfully in Libyan hospitals despite challenges. The complication rate and results were low, but careful patient selection, surgical technique, and follow-up are important to reduce complications and improve outcomes. **Recommendation:** Surgeons need proper training and resources for primary THR. A DVT prophylaxis protocol should be developed based on local risks. Further research is needed to investigate complications, risk factors, outcomes, and patient satisfaction in Libyan patients who undergo THR.

Keywords: total hip replacement, prosthesis, complication, outcome, retrospective study

Introduction:

Hip arthritis is a common and disabling condition, that affects millions of people worldwide. It causes pain, stiffness, reduced mobility, and impaired quality of life. Total hip replacement (THR). It is considered one of the most successful and cost-effective interventions for patients with end-stage hip arthritis who do not respond to conservative treatments.

There are different types of prostheses and techniques used for THR, each with its own advantages and disadvantages. The choice of the prosthesis and the technique depends on various factors, such as the patient's age, activity level, bone quality, anatomy, and surgeon preference. Some of the common types of prostheses are cemented, non-cemented, and hybrid (partial cementing). The main advantages of cemented prostheses are their immediate stability and low risk of loosening at a short time follow-up, but on a long time follow up the first common complication is loosening in cemented THR, while the main advantages of non-cemented prostheses are their lower risk of infection and better long-term survival. Hybrid prostheses aim to combine the best of both worlds.

Aim of the study: this was to review the outcomes of total hip Replacement (THR) done in Alkhadra Hospital from 1/9/1993 to 1/9/1997 using different types of prostheses and techniques. The objectives were to evaluate the clinical and radiological results, the complications, and the revision rates of the THR. **The research questions were:** What are the demographic and clinical characteristics of the patients, what types of prostheses and techniques have been used, and what are the clinical and radiological outcomes, what are the complications and revision rates of THR in Alkhadra Hospital?

Methods and Materials:

This study was a retrospective analysis of the records of 70 patients who underwent 77 THR at Alkhadra Hospital, a tertiary care center in Libya, from 1/9/1993 to 1/9/1997. We collected data on the demographic characteristics of the patients, such as age and sex, as well as the diagnosis that led to THR, the surgical approach used, the type and brand of implant inserted, the use of cement and bone grafting, and any intraoperative or postoperative complications. We followed up with the patients for an average of 5 years (range 2 to 10 years) and evaluated their clinical and radiological outcomes using the Harris hip score (Wamper, Kim E., et al 2010) and the (DeLee, Charnley classification 1976). statistical analysis has been done to compare the outcomes among different groups of patients based on their diagnosis, implant type, and cement use. We followed a standard protocol for the postoperative management of the patients. Patients with uncemented components were restricted from full weight bearing for six weeks after the surgery, to allow for Osseointegration and prevent loosening. X-ray was done postoperatively for all the patients, in some cases, we used an image intensifier device to assess the stability and prosthetic alignment of the hip joint. We performed routine radiographs at two and six weeks postoperatively and detect any early complications. All patients received prophylactic antibiotics to prevent infection. Rocephin 1g has been given intravenously preoperatively and continued orally for two weeks postoperatively, and gentamicin 80 mg was given intravenously for three days after the surgery. Only high-risk patients for deep vein thrombosis (DVT), such as those with obesity, long recumbency, prolonged operative time, or history of DVT, received heparin subcutaneously until they were mobilized.

Results:

Out of the 70 patients (77 hips) included in this study: as shown in Table (1)

Table (1): Sex distribution

Male	34	49%
Female	36	51%

The age distribution is seen the Table No. (2)

Table (2): Age distribution

10–20 yrs.	1	1.4%
21–30 yrs.	7	10%
31–40 yrs.	5	7.1%
41–50 yrs.	16	22.9%
51–60 yrs.	10	14.3%
61–70 yrs.	24	34.3%
71–80 yrs.	6	8.6%
81–90 yrs.	1	1.4%

There were different indications of THR as summarized in table No. (3)

Table (3): Indications of THR

The complication of hemiarthroplasty post fracture neck of femur	12	16%
Avascular necrosis(steroid-induced)	11	14%
hip dysplasia	8	10%
ankylosing spondylitis	6	8%
Rheumatoid arthritis	9	12%
Painful previous hemiarthroplasty	7	9%
Osteoarthritis	24	31%

In the majority of the cases unilateral total hip prosthesis was done, details are shown in Table number (2)

Table (4): Affected side

Unilateral	63	90%
Bilateral	7	10%
Rt. hip	31	40.3%
Lt. hip	32	41.6%
Both hips	14	18.2%

In our hospital, four types of prostheses have been applied and we did also a combination of two prostheses in some cases as seen in Table No. (4)

Regarding the surgical approach, most of our surgeons adapted to the anterior approach with some preference for the lateral approach as shown in table No. (5)

Table (5): Surgical approach

Anterior	67	87%
Posterior	8	10.4%
Lateral	2	2.6%

Table (6): Type of prosthesis

Charnley	2	2.6%
Müller	19	24.7%
P.C.A	36	46.8%
A.B.G	12	15.6%
Combined	8	10.4%

Intra-operatively our surgeons decided to cement the cases in which the bone is osteoporotic as seen in Table No. (7)

Table (7) number of cemented and non-cemented cases

Cemented	39	50.6%
Non-cemented	26	33.8%
Partially cemented	12	15.6%

We have 31 cases with different complications, all are listed in Table No. (8)

Table (8) Complications

Mal alignment	12		15.6%
	Varus	8	
	Vertical cup	6	
Immediate Dislocation	3		3.9%
Infection	1		1.3%
Femoral neck fracture	2		2.6%
Revision	6		7.8%
	Cup loosening	3	
	Dislocation	3	
D.V.T	1		1.3%
Heterotrophic bone formation	6		7.8%

Six hips (7.8%) required revision surgery for various reasons, and two hips (2.6%) had both acetabular and femoral components loosening, which was detected by radiographs and confirmed polyethylene insert fragmentation in PCA (type of prosthesis) cups, which occurred on average two years after the primary surgery. The patients presented with severe pain and limited range of motion on their hips. The radiographs showed metal inserts loosening and cup malpositions with polyethylene metal indicators. At revision, the polyethylene cups were found to be worn and fragmented. We replaced both the outer and

inner shells and used bone grafting in two cases to fill the bone defects. One hip had a malpositioned femoral component with excessive anteversion, which caused impingement and instability of the hip joint. We revised the femoral component and the femoral stem has been changed with the correction of the anteversion angle.

We evaluated the functional status of the patients before and after THR. Of the 70 patients who underwent THR, 22 (31%) were unable to walk preoperatively due to various conditions that affected their hip joints such as rheumatoid arthritis in 6 patients (8.6%), ankylosing spondylitis in three patients (4.3%), failed hemiarthroplasty three patients (4.3%) and primary osteoarthritis ten patients (14.3%). Two patients (2.9%) had bilateral avascular necrosis of the hip and were bedridden or wheelchair dependent. The rest of the patients used one or two crutches for walking. None of them could walk without support. At four weeks postoperatively, all 22 patients (31.4%) who were unable to walk preoperatively could walk with two crutches, and some of them could walk with one crutch. All patients reported excellent pain relief after THR, according to Harris's hip score (Wamper, Kim E., et al, 2010) and this was maintained throughout the follow-up period. Heterotopic ossification occurred in six patients (8.6%) postoperatively. We classified the heterotopic ossification according to the criteria of (Brooker et al, 1973) into four grades based on the radiographic appearance. Four patients (5.7%) had grade I heterotopic ossification, two patients (2.9%) had grade II heterotopic ossification, no one had grade III or IV heterotopic ossification, no one needed an excision of the heterotopic bone and all received indomethacin, which is a nonsteroidal anti-inflammatory drug that can prevent heterotopic ossification. We found that heterotopic ossification was more common in patients with ankylosing spondylitis (3 out of 6 patients) and in patients who had bone grafting to

reconstruct the acetabulum (2 out of 8 patients). The radiological assessment showed 12 hips (15.6%) with malalignment of the components, which can affect the stability and longevity of the prosthesis. Eight hips (10.4%) had varus femoral components, and six hips (7.8%) had retroverted or vertical cups, three hips (3.9%) dislocated immediately after the surgery due to excessive anteversion, retroversion, or spiking of the components revised these hips and corrected the component position. Intraoperative femoral neck fracture occurred twice (2.6%) during the insertion of larger femoral components than the canal sizes. We fixed these fractures with cerclage wiring. Superficial wound infection and deep vein thrombosis (DVT) occurred in one case (1.4%) each and were treated with antibiotics and anticoagulants respectively.

Discussion:

The main objective of this study was to evaluate the short- and long-term follow-ups up to 5 years becomes of a consecutive series of primary THR using different kinds of implants in a tertiary care center in Libya. The results showed that despite the lack of operative facilities and experience, the outcomes were excellent regarding pain relief and functional improvement. According to the Harris Hip Score (HHS) (Wamper, Kim E., et al,2010) Only one patient (1.4%) had a superficial wound infection treated with antibiotics, and one patient (1.4%) had deep vein thrombosis, 34.0% (n = 16) in another study (Schindler OS,2005) treated with anticoagulants. Six hips (7.8%) required revision surgery for various reasons and in comparison with another study, it was for aseptic loosening (52%) and for periprosthetic fractures (18%) (Oltean-Dan D, et al.2022). Three hips (3.9%) have acetabular and femoral component loosening, which was detected by radiographs and confirmed by intraoperative findings. The other three hips (3.9%) were revised due to technical difficulties during the primary surgery, such as difficulty in inserting

the acetabulum in one hip (1.3%), difficulty in inserting the femoral component in one hip (1.3%) and sinking of the femoral component in a wide medullary canal one hip (1.3%). Three hips (3.9%) with PCA cups were revised due to cup loosening and polyethylene insert fragmentation, which occurred on average two years after the primary surgery. The patients presented with severe pain and limited range of motion of the hip. The radiographs showed the metal insert loosening and cup malposition with polyethylene metal indicators. At revision, the polyethylene cup was found to be worn and fragmented. We replaced both the outer and inner shells and used bone grafting in two hips (2.6%) to fill the bone defects. It is unclear whether loosening or fragmentation was the primary cause of failure in these cases. Heterotopic ossification occurred in six patients (8.6%) postoperatively in comparison with another study it was observed in 52 hips (28,7%) (Spinarelli A, et al,2011). We classified the heterotopic ossification according to the criteria of (Brooker et al,1973) into four grades based on the radiographic appearance. Four patients (5.7%) had grade I heterotopic ossification in another study it was graded I in 32 (17.7%) hips, which is minimal bone formation in the soft tissues, and two patients (2.9%) had grade II heterotopic ossification in another study grade II in 14 (7.73%) hips, which is bone spurs that do not cross the center of rotation of the hip joint. No one had grade III or IV heterotopic ossification, in another study grade III in 6 (3,3%) hips which are more severe forms that can cause ankylosis of the hip joint. No one needed excision of the heterotopic bone and all received indomethacin, which is a nonsteroidal anti-inflammatory drug that can prevent heterotopic ossification. We found that heterotopic ossification was more common in patients with ankylosing spondylitis (3 out of 6 patients) and in patients for whom bone grafting was done to reconstruct the acetabulum (2 out of 8 patients). These

factors are known to increase the risk of heterotopic ossification, as well as male sex, trochanteric division, and infection. We followed a selective protocol for DVT prophylaxis in our patients. We used DVT prophylaxis only in high-risk patients (32 patients) and only one patient developed DVT. This may indicate that DVT is rare after hip surgery in Libyan patients, unlike other studies that reported a high incidence of DVT without prophylaxis. For example, (Belech et al,1991) [and \(Bergqvist et al,1996\)](#) reported a 40–60% incidence of DVT in patients who had not received prophylaxis after the hip surgery. We suggest that a prospective study is needed to assess the incidence and risk factors of DVT after hip surgery in Libyan patients.

Conclusion:

This study shows that despite the lack of operative facilities and experience, primary total hip replacement (THR) can be performed with good outcomes in Libya hospitals. The complication rate was low, and the results compare favorably with those reported in the literature. However, some complications that occurred led to revision surgeries. Therefore, careful patient selection, surgical technique, and follow-up are essential to reduce the risk of complications and improve the long-term outcomes of THR .

Recommendations:

We recommend that orthopedic surgeons should receive adequate training and resources to perform primary THR safely and effectively. Furthermore, a standardized protocol for DVT prophylaxis should be developed based on local risk factors and patient characteristics. Finally, further research is needed to investigate the incidence and risk factors of complications after THR in Libyan patients, as well as the long-term outcomes and patient satisfaction. This will help to improve the quality of care and optimize the use of resources for patients undergoing THR in Libya.

References:

1. Wamper, Kim E., et al. "The Harris hip score: do ceiling effects limit its usefulness in orthopedics? A systematic review." *Actaorthopaedica* 81.6 (2010): 703–707.
2. DeLee JG, Charnley J. Radiological demarcation of cemented sockets in total hip replacement. *ClinOrthopRelat Res.* 1976;121:20–32
3. Brooker AF, Bowerman JW, Robinson RA, Riley LHJR. Ectopic ossification following total hip replacement. Incidence and a method of classification. *The Journal of bone and joint surgery. American volume.* 1973;55:1629–1632. doi: 10.2106/00004623-197355080-00006
4. Belech A, Kjaersgaard-Andersen P, Hvid I, Jensen J. The influence of thromboprophylaxis on the postoperative course after total hip arthroplasty. A randomized placebo-controlled study. *J Bone Joint Surg Br.* 1991;73(6):978–81.
5. Bergqvist D, Benoni G, Björgell O, Fredin H, Hedlundh U, Nicolas S, Nilsson P, Nylander G. Low-molecular-weight heparin (enoxaparin) as prophylaxis against venous thromboembolism after total hip replacement. *N Engl J Med.* 1996;335(10):696–700.
6. Schindler OS, Dalziel R. Post-thrombotic syndrome after total hip or knee arthroplasty: incidence in patients with asymptomatic deep venous thrombosis. *J OrthopSurg (Hong Kong).* 2005 Aug;13(2):113–9. doi: 10.1177/230949900501300202. PMID: 16131671.
7. Spinarelli A, Patella V, Petrera M, Abate A, Pesce V, Patella S. Heterotopic ossification after total hip arthroplasty: our experience. *Musculoskelet Surg.* 2011 Apr;95(1):1–5. doi: 10.1007/s12306-010-0091-6. Epub2011 Jan 6. PMID: 21210261.
8. Oltean-Dan D, Apostu D, Tomoaia G, Kerekes K, Păiușan MG, Bardas CA, Benea HRC. Causes of revision after total hip arthroplasty in an orthopedics and traumatology regional center. *Med Pharm Rep.* 2022 Apr;95(2):179–184. doi: 10.15386/mpr-2136. Epub 2022 Apr 28. PMID: 35721045; PMCID: PMC9176300.