



# Good Results by Revision for Hip Pain Following Unipolar Hemiarthroplasty with Long Stem Cementless Total Hip Arthroplasty

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Citation: Mahran M, Omar UF, Abdelnasser MK, Badran M and Bakr H (2018) Good Results by Revision for Hip Pain Following Unipolar Hemiarthroplasty with Long Stem Cementless Total Hip Arthroplasty. J Orthop Skeletal Med 2(1): 103

## Abstract

**Background:** Arthritic acetabulum, protrusio acetabuli, loosening either septic or aseptic are among the main causes of hip pain after hemiarthroplasty, conversion of hemiarthroplasty into THR is well known procedure that requires good preoperative planning.

**Patients and Methods:** 30 patients (23 males and 7 females) were followed in prospective way from 2013 till 2017. Revision was done by long stem cementless THR either as one stage or 2 stages in cases of septic loosening or presences of high inflammatory markers. Average age at surgery was 57.5 years old. Patients were evaluated by preoperative x-ray and inflammatory markers level, immediate post-operative and it 3,6,9,12 months post-operative x-rays. Pre-and 3 months post-operative Harris Hip Score was calculated.

**Results:** 86.7% of cases showed improvement of hip pain during 1<sup>st</sup> week post operatively, while remaining 13.3% hip pain improved during 1<sup>st</sup> month. No patients developed post-operative sciatic nerve palsy. Harris Hip score increased from (28-40) preoperatively to (75-90) post-operatively.

**Conclusion:** Revision with long stem cementless THR after failed hemiarthroplasty is a good surgical option that helps to relief pain and improves movement besides decreasing recumbancy and its complications. Wise preoperative planning helps to avoid intraoperative complications and better results are gained.

**Keywords:** Cementless THR; Hemiarthroplasty; Hip pain

**List of abbreviations:** THR: Total hip replacement; DVT: Deep venous thrombosis; ROM: Range of motion; THA: Total hip arthroplasty; LLD: Limb length discrepancy; ADL: Activities of daily life

## Introduction

Femoral neck fractures are one of the most common fractures seen in elderly. Generally speaking, rate of hip fractures in elderly was about 1.7 million in 1990 and expected to reach about 6.3 million in 2050. Based upon gender variation, 90% of hip fractures occur in males and 80% in females aged more than 50 years old. Based on anatomical consideration and vascular supply of femoral head, trial to fix this type of fracture with screws and/or plate is less favorable specially in old age [1]. Treating those fractures with hemiarthroplasty serves a good result due to early ambulation and weight bearing. It helps in protecting from further complications that could result from recumbency such deep venous thrombosis (DVT) and bed sores. Also, being affordable by most of patients specially in developing countries, makes it preferred by surgeons in trauma units. With longer follow up of these cases, some of them start to develop hip pain that start to affect their daily activities. This pain can be due to protrusio acetabuli, septic or a septic loosening. Creating painless free range of motion (ROM) for those patients remains the target for hip and arthroplasty surgeons. Conversion of failed hemiarthroplasty into total hip arthroplasty (THA) is not a new technique. It was described by Dupont and Wrightington in 1972. Revision is made to relief hip pain and prevent recumbency, decreased physical activity and subsequent complications that could occur from either or both of them [2].

## Patients and Methods

In the period between 2013 to 2017, 23 males and 7 female patients with hip pain who did hemiarthroplasty before

(Thompson or Austin Moore). 25 patients underwent hemiarthroplasty for fracture neck of femur, while 5 patients did hemiarthroplasty for trochanteric fracture of femur (Figure 1). Right side was affected in 18 patients and left side was affected in 12 patients. Average age at surgery was 57.5 years old (ranges from 50-65 years old). 21 cases did revision directly from hemiarthroplasty to long stem cementless THR in one stage (Figure 2). Eight cases underwent 2 stage revision from hemiarthroplasty to long stem cementless THR. Only one case underwent girdle stone after two times 1<sup>st</sup> stage revision due to persistent high inflammatory markers that started to decline into normal values after treatment of urinary tract infection. The minimum operating time was one hour, and half and maximum time was three hours with mean time 2.25 hours. The minimum follow up period was 1 years and the maximum was 3 years. The mean follow up period was 2 years.



**Figure 1:** Female patient, 64 years old, with cemented Thompson for 4 years duration, complaining of hip and anterior thigh pain and walking supported, due to aseptic loosening and erosion of acetabular cartilage



**Figure 2:** Same patient after one stage revision by long stem, cerclage and plate were put in the same stage to treat the fracture done during cement extraction

## Surgical Approach

Under general or spinal anesthesia, patient is set in lateral decubitus position. Pressure points and the other limb shoulder be well supported. Draping from umbilicus till foot. Lateral Incision is centered over greater trochanter beginning at 5 cm proximal to greater trochanter extending about 10 cm distal to greater trochanter. Modified Hardinge approach was used in all patients. Previous scar is excised to facilitate skin healing. The iliotibial band is split in line with the femur distally while curved splitting towards the ASIS is made proximally [3-5]. A retractor is placed. Trochanteric bursa is excised. The most anterior fibers of gluteus medius muscles are incised to allow for good surgical exposure. Also helps to guard against injury of superior gluteal nerve which enters the gluteus minimus muscle at its posterior

surface. Diathermy is used to incise vastus lateralis in direction of its fibers. Gentle hip external rotation is done in order to bring posterior fibers into our sight. Posterior fibers of vastus lateralis and gluteus medius are kept. Gluteus minimus is splitted in line with its fibers. Gluteus medius and vastus lateralis are preserved as one part that would allow for better closure at end of procedure. Capsule is incised in inverted T shaped manner. Hemiarthroplasty is removed. Old cement is removed using cement removal tools and curette. Acetabulum then exposed and acetabular reaming is carried out. This is followed of inserting acetabular cup and fixation by screws. Surgical dislocation is carried out by flexion and external rotation of hip. Preparation of femoral medulla is done. Gradual reaming of femoral medulla is started. Stem, neck and head trails are inserted. Reduction is made. After assuming proper size of stem, neck and head and good reduction, trial is removed, and femoral stem, neck and head are inserted. Final reduction is done and stability in all directions is tested. Closure is then started by deep layers from capsule, gluteus minimus and medius up to vastus lateralis. Iliotibial band, subcutaneous layer are closed. Finally, skin is closed using stapler. Sterile dressing is applied.

## Results

All patients underwent THR of the affected hip joint using long stems cementless THR (Corail Revision System, Depuy Synthes). No significant Limb length discrepancy (LLD) was detected postoperatively. All cases were followed radiological and clinical pre-and post-operative. No significant subsidence was detected at last follow up x-ray. 86.7% of cases showed improvement of hip pain during 1<sup>st</sup> week post operatively, while remaining 13.3% hip pain improved during 1<sup>st</sup> month. No patients developed post-operative sciatic nerve palsy. All cases were allowed for full weight immediately after surgery. 1<sup>st</sup> generation cephalosporin was used as prophylaxis for post-operative infection. All patients received Enoxaparine Sodium 40 mg subcutaneous injection prior to surgery and stopped 24 hours before surgery. Oral anticoagulant (Asprin 81 mg) was started from 5th day post-operative till 3 weeks post-operative. Post-operative rehabilitation program started from 2nd day after surgery by partial weight bearing (toe touch) using non-hinged 4 limbs walker. Active and passive ROM of hips, knee and ankle are allowed but with restriction to extremes of hip flexion, external rotation and abduction. 6 weeks post-operative, patients is allowed for full weight bearing with gradual withdrawal of different walk aid support over 3 weeks. Skin wounds were closed by staples which were removed at 21 days post-operative. No cases showed wound dehiscence. Harris Hip score increased from (32-45) preoperatively to (75-90) post-operatively.

## Discussion

Hip pain after hemiarthroplasty is a problem that should be taken seriously to identify the underlying pathology of this pain. Also focused clinical examination, radiological and laboratory investigations should be done in order not to mislead the patient. Different literature has reported hemiarthroplasty complications rate. D'Arcy J reported that percentage for acetabular erosion, loosening and infection were 11%, 6.1% and 1.8% respectively. Although, Swiontkowski created an algorithm for treating femoral neck fractures as follow: patient aged < 65 years old should do internal fixation, patients aged > 75 years old should be treated by hemiarthroplasty while for patients in age group 65-75 years old should be internally fixed if they have good bone quality or do hemiarthroplasty if bone is osteoporotic [6]. He mentioned in his article that all comparative studies between internal fixation and arthroplasty are in favor of arthroplasty due to less failure rates. Over years conversion of hemiarthroplasty into THR have been done and techniques are getting improved to minimize intra and post-operative complications [7]. Salama., *et al.* did revision of 40 patients who developed hip pain after hemiarthroplasty with long stem modular cementless THR with distal locking. All cases were improved either clinically or radiologically. Wender Fugved., *et al.* found that lower revision rate when converting hemiarthroplasty into THR with changing femoral stem than in keeping femoral stem during conversion despite the type of hemiarthroplasty used in study that included 595 cases over 17 years [8]. Using another technique for revision by using cement on cement technique showed comparable success rate with other techniques and authors stated that there's great reduction of operating time [9]. Bhosale., *et al.* and ÖF Bilgen., *et al.* reported that conversion from hemiarthroplasty to THR is a successful procedure [9,10]. However, this maneuver can be avoided by paying great attention to patients with femoral neck fractures for choosing type of implant used at time or trauma. Hemiarthroplasty should be avoided in those patients who are physically active with follow up of patients up to 84 months, A. Hammad, A. Abdel-Aal., *et al.* founded that there is decline in functional results of patients aged from 50-60 years old from excellent to good results as regarding their walking distance and activities of daily life (ADL) [11,12]. While for those aged 70s or more their functional results remain at the same level due to their reduced level of physical activity randomized controlled study created by Baker, for treating patients with femoral neck fractures with either hemiarthroplasty or THR, showed that THR was superior to hemiarthroplasty in less revision rate and

hip erosion [13]. While hemiarthroplasty was superior to THR in less dislocation rate. For patients who underwent cemented hemiarthroplasty and cemented THR for treatment of femoral neck fractures both got the same Harris Hip Score after 12 years follow up [14,15].

In our series, over the minimum and maximum follow up period, none of the patient experienced loosening of implant used. Pain improved in 26 patients and remaining 4 patients during 1st week and 1st month respectively. Average increase in Harris Hip score was 44. Longer follow up period and larger sample size could be needed for detecting loosening and failure rate of used implant.

## Conclusion

Revision of hemiarthroplasty with long stem cementless THR revealed good results of fewer incidences of subsidence and loosening as in revision with cemented THR. Careful preoperative planning should be done for possible avoidance of intraoperative and postoperative complications.

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