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Case Series

Direct lateral approach for hemiarthroplasty: a case series

Ashoke K. Chanda, Raju Mandal, Sudipta Dasgupta, Kousik Biswas*, Rayan Dalal, Himangshu Mudi

Department of Orthopaedics, CNMCH, Kolkata, West Bengal, India

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***Correspondence:**
Dr. Kousik Biswas,
E-mail: dr. kousik.biswas.1990@gmail.com

ABSTRACT

Worldwide, hip fractures are a public health concern. The primary course of treatment for displaced femoral neck fractures is still surgery. Even now, hemiarthroplasty remains a highly preferred surgical procedure. The most popular methods for gaining access to the hip joint are the direct lateral and posterior approaches. Aim of this series is to research the short-term functional results, risks, and disadvantages of the direct lateral approach to the hip. Patients with traumatic neck of femur fracture coming to the Department of Orthopaedics, Calcutta National Medical College and Hospital and was elected for bipolar hemiarthroplasty as treatment option. Among the 12 cases 9 were males and 3 were females. The value of z is 2.4495. The value of p is 0.01428. The result is significant at $p<0.05$. Garden's classification - there were 2 cases of type 3 garden and 10 cases of type 4 garden fractures. The value of z is 3.266. The value of p is 0.00108. The result is significant at $p<0.05$. Though there is a chance of iatrogenic gluteal nerve and vascular injury - which we did not encounter in our case - the direct lateral approach exposes the hip joint to a sufficient but limited degree. However, the risk of post-operative hip dislocation is minimal because the rotator cuff of the hip joint is preserved; none of the 12 cases that were chosen had this condition.

Keywords: Hemiarthroplasty, Hip fractures, Femoral neck

INTRODUCTION

Worldwide, hip fractures are a public health concern. The primary course of treatment for displaced femoral neck fractures is still surgery. Even now, hemiarthroplasty remains a highly preferred surgical procedure. The most popular methods for gaining access to the hip joint are the direct lateral and posterior approaches. A technique for maintaining the integrity of the gluteus medius muscle during a posterior approach exposure of the hip joint was reported by McFarland and Osborne in 1954. Hardinge altered the procedure by dividing the gluteus medius and releasing only half of the muscle anteriorly. This is called direct lateral approach to hip.[1]

Nearly half of all hip fractures are acute displaced intracapsular femoral neck fractures, and the majority of these fractures in older patients in developed countries are treated surgically with internal fixation, total hip arthroplasty, or hip hemiarthroplasty.[2] In addition, hemiarthroplasty is used to treat pathologic femoral neck fractures, failed screw fixation, and non-union of the femur.

There is controversy about the optimal surgical technique for hemiarthroplasty, including surgical approach (anterior, lateral or posterior), endoprosthesis head (unipolar modular, unipolar monoblock, or bipolar) and stem fixation (cemented or uncemented).[3] Femoral component fixation in hemiarthroplasty outside North America commonly involves use of cement, but uncemented, press-fit fixation frequently is used in North America.[4,5] Acetabular wear, infection, instability, aseptic loosening, and periprosthetic fracture are the most frequent reasons for hemiarthroplasty reoperations worldwide;

however, there is a dearth of information regarding hemiarthroplasty failure types in Canada.[6]

CASE SERIES

All patients were operated under spinal anaesthesia in lateral decubitus position by a single team of surgeons. Through a standard direct lateral approach (DLA) to hip.

The DLA incision is started 2–4 cm proximal to the anterior-middle third of GT and extended distally in line with the femur to a point 4–6 cm distal to GT (Figure 1).

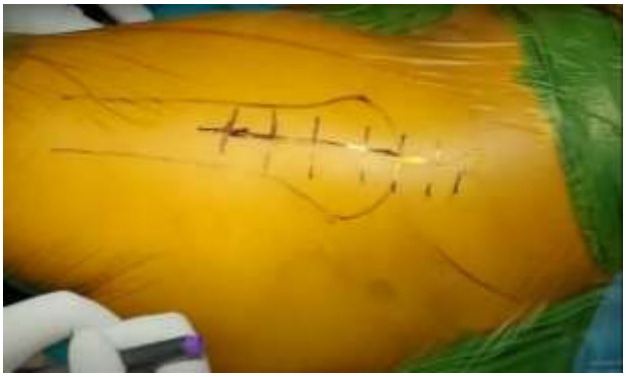

Figure 1: Skin incision.

Divide the fascia lata in line with the skin incision and centered over the greater trochanter.

Retract the tensor fasciae latae anteriorly and the gluteus maximus posteriorly, exposing the origin of the vastus late ralis and the insertion of the gluteus medius**.**

Incise the tendon of the gluteus medius obliquely across the greater trochanter, leaving the posterior half still attached to the trochanter. The split is started at GT and its proximal extension should be limited to 3–5 cm. to avoid damage to the superior gluteal nerve and artery. Distally, carry the incision anteriorly in line with the fibers of the vastus lateralis down to bone along the anterolateral surface of the femur (Figure 2).

Figure 2: Incision of the glutinous tendon.

Elevate the tendinous insertions of the anterior portions of the gluteus minimus and vastus lateralis muscles.

A cuff of medius tendon should remain on the anterior border of GT to allow for later repair.

Once the hip joint is exposed, the femoral neck is delivered into the wound and the femoral neck is cut (Figure 3).

The femoral head can then be removed from the acetabulum.

Figure 3: Exposure of the hip joint and femoral head delivery.

The femoral canal is reamed and the chosen prosthesis inserted. Once the implant is inserted, reduction is accomplished (Figure 4). Once the implant is reduced, the capsule is repaired, and the wound closed.

Figure 4: Placement of prosthesis and reduction into acetabulum.

All patients were followed up at 2 weeks, 6 weeks, 3 months and 6 months. Static quadriceps exercise, knee flexion was started from day 1 of surgery after the anesthetic effect wore off. Toe-touch weight bearing with a crutch was started from day 2. Stitch off of surgical wound was done at first post-op follow up at 2 weeks post-op. Patient was also allowed protected partial weight bearing as tolerated. Patient was gradually allowed to bear full weight and side lying abduction from 6 weeks.

Case 1

A 55 years old female patient presented with 4 days old Traumatic femur neck fracture Garden's type 2. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with fixed bipolar prosthesis via DLA. On 6 months follow-up her Harris hip score was 84. There was no late complication. (Figure 5).

Figure 5: (a) Pre-operative X-ray, and (b) post-operative X-ray.

Case 2

A 72 years old female patient presented with 2 days old traumatic femur neck fracture Garden's type 4. She is a known diabetic. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up her Harris hip score was 80. At 6 months she had abductor lurch which persisted after physiotherapy (Figure 6).

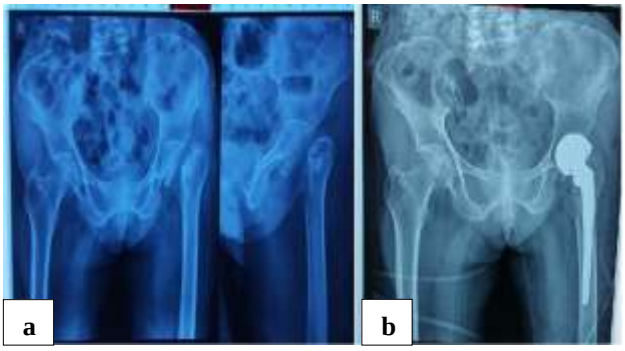

Figure 6: (a) Pre-operative X-ray, and (b) post-operative X-ray.

Case 3

A 55 years old male patient presented with 12 days old traumatic femur neck fracture Garden's type 3. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months followup his Harris hip score was 86. There were no complications.

Case 4

A 58 years old female patient presented with 21 days old traumatic femur neck fracture Garden's type 4. She is a known hypertensive. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up her Harris hip score was 86. There were no complications (Figure 7).

Figure 7: (a) Pre-operative X-ray, and (b) post-operative X-ray.

Case 5

A 82 years old female patient presented with 2 days old traumatic femur neck fracture Garden's type 4. She is a known diabetic. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up her Harris hip score was 72. There were no complications (Figure 8).

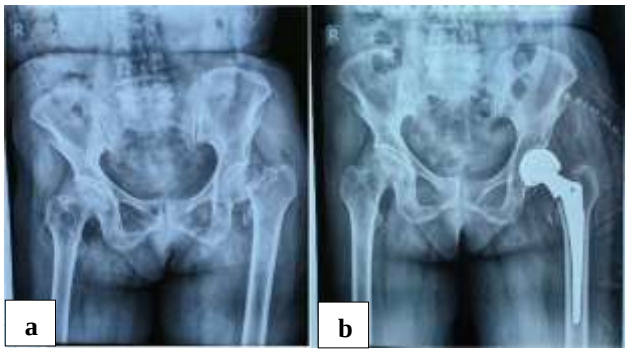

Figure 8: (a) Pre-operative X-ray, and (b) post-operative X-ray.

Case 6

A 71 years old male patient presented with 6 days old traumatic femur neck fracture Garden's type 4. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up her Harris hip score was 70. At 6 months he had abductor lurch which persisted after physiotherapy (Figure 9).

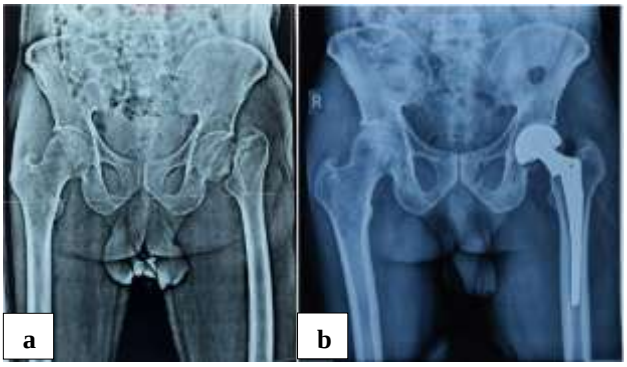

Figure 9: (a) Pre-operative X-ray, and (b) post-operative X-ray.

Case 7

A 50 years old male patient presented with 1 days old traumatic femur neck fracture Garden's type 3. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up his Harris hip score was 84. There were no complications (Figure 10).

Case 8

A 68 years old male patient presented with 7 days old traumatic femur neck fracture Garden's type 3. He is a known hypertensive. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up his Harris hip score was 76. There were no complications.

Case 9

A 73 years old female patient presented with 12 days old traumatic femur neck fracture Garden's type 4. She is a known diabetic and hypertensive. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up her Harris hip score was 70. There were no complications.

Case 10

A 70 years old female patient presented with 4 days old traumatic femur neck fracture Garden's Type 4. She is a known diabetic and hypertensive. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up her Harris hip score was 61. At 6 months she had abductor lurch which persisted after physiotherapy.

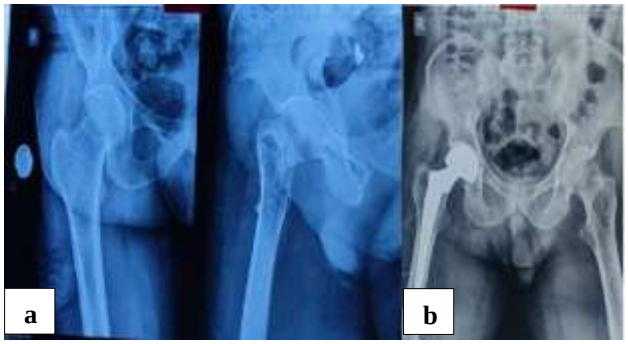

Figure 10: (a) Pre-operative X-ray, and (b) post-operative X-ray.

Case 11

A 56 years old female patient presented with 3 days old traumatic femur neck fracture Garden's type 3. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up her Harris hip score was 78. There were no complications.

Case 12

A 65 years old male patient presented with 4 days old traumatic femur neck fracture Garden's type 4. He is a known hypertensive. Active straight leg rising test was negative on the affected side. The patient was treated with hemiarthroplasty with modular bipolar prosthesis via DLA. On 6 months follow-up his Harris hip score was 80. There were no complications.

DISCUSSION

The present study was an observational institutional based study. This study was conducted from 01 July 2022 to 30 June 2023 at Department of Orthopaedics. Total 12 patients were included in this study.

Moretti et al found that in all of medicine, total hip arthroplasty (THA) has emerged as one of the most dependable and often requested surgical procedures.[7] Although there are other surgical methods that can be used to do the treatment, the posterior approach, direct lateral approach, and direct anterior approach are the most commonly used worldwide. This page explains the background and methodology of each of these popular strategies. For every strategy, a summary of the results and drawbacks is also given. Each approach has its own unique advantages and disadvantages, but all can be safely and successful utilized for THA. We found that, male population was higher [9 (75.00%)] than the female population [3 (25.00%)]. Male: female ratio was 3:1 but this was statistically significant (p=0.01428).

We discovered that Garden type 4 affected the majority of patients [10 (83.33%)]. It was statistically significant (p=0.00108), (z=3.266).

Luo et al found that preoperative demographics for the THA group, including sex, age, BMI, and Charlson comorbidity score (n=55) has no statistically significant difference with that of HA group.[8] Patients treated by THA had significantly longer operation time (105.5 versus 76.7 minutes; p<0.001), more blood loss (524.1 versus 350.1 ml; p<0.001) and longer hospitalization time (15.8 versus 13.8 days; p<0.001). There were no significant differences between two groups in complications (32.7% versus 25.8%, p=0.432).

Subhash et al showed that the preferred course of treatment for displaced intracapsular femoral neck fractures has been determined to be hemiarthroplasty.[9] There were 533 hemiarthroplasty operations completed in all, 27 of which were modular procedures for a small femoral canal. The ratio of modular to monobloc was 1:18. Average head size was 46.7±3.6 mm for monobloc and 44.07±1.5 for modular (p=0.001).

We examined that, majority of the patients had morbidities free [5 (41.66%)] and it was statistically significant (p=0.17702), (z=1.3473).

Su et al observed that four RCTs, two cohort studies, three case-control trials, and three cross-sectional surveys make up the final list of included literature.[10] This study compared HRQoL scores measured by the EU-5Q scale, including 328 elderly patients with THA and 323 elderly patients with hemiarthroplasty, which is statistically significant (OR=0.05; 95% CI, 0.02~0.08; p=0.002).

We found that, significantly higher of patients had good Harris hip score 4 (33.33%) and it was statistically significant (p=0.13104), (z=1.5079).

We examined that, 1 (8.33%) patients had infection.

CONCLUSION

Though there is a chance of iatrogenic gluteal nerve and vascular injury, which we did not encounter in our case. The direct lateral approach exposes the hip joint to a sufficient but limited degree. However, the risk of post-operative hip dislocation is minimal because the rotator cuff of the hip joint is preserved; none of the 12 cases that were chosen had this condition. The major drawback of DLA presents as a significant risk of abductor lurch. The functional prognosis six months after surgery was favourable. Blood loss and operating time are both acceptable low.

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Ethical approval: Not required

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