

## Post-operative short-term clinical evaluation of direct lateral (Harding) approach in primary total hip replacement

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### Abstract

**Objective:** To evaluate patients' functional outcomes after total hip arthroplasty through a direct lateral approach.

**Methods:** The prospective, observational, descriptive study was conducted at Al-Yarmouk Teaching Hospital, Baghdad, Iraq, from May 2019 to June 2020, and comprised patients aged 28-81 years having advanced osteoarthritis and avascular necrosis who underwent cementless total hip arthroplasty. The patients were followed up for 6 months. Outcome was assessed using the Harris hip score, Trendelenburg sign, post-operative hip dislocation, post-operative infection, and heterotopic ossifications. Data was analysed using Excel version 2019.

**Results:** Of the 30 patients, 14(47%) were males and 16(53%) were females. The overall mean age was  $49.8 \pm 15.28$  years. The mean pre-operative Harris hip score was  $43.166 \pm 8.27$ , while it was  $83.566 \pm 3.83$  post-operatively ( $p < 0.001$ ). There was 1(3.33%) case of heterotopic ossification, 3(10%) had Trendelenburg sign. There was no case of postoperative hip dislocation or infection.

**Conclusion:** The lateral hip approach was found to be associated with good post-operative hip stability and good post-operative functional outcome with low post-operative risk of infection.

**Key Words:** Arthroplasty, Replacement, Hip, Osteoarthritis, Ossification, Heterotopic, Necrosis (JPMA 74: S142 (Supple-8); 2024) DOI:<https://doi.org/10.47391/JPMA-BAGH-16-31>

### Introduction

Total hip arthroplasty (THA) has established itself as one of the most successful surgeries performed among all surgical specialities, and it is the definitive treatment of end-stage osteoarthritis (OA) of the hip. The other options of femoral and pelvic osteotomies and arthrodesis to treat hip OA are now rarely done, and excision arthroplasty of the hip is considered a salvage operation only in cases of persistent hip infection. These operations now mostly carry historical value for hip OA as they played a significant role in earlier times, presenting a reasonable option for pain relief. They did not, however, restore the biomechanics of the hip. In fact, they were most often associated with restriction of hip joint movements, and, as a result, the trade-off for pain relief was poor hip function. The success of THA is in the main part due to there being no such trade-off in function. The fact that THA relieves pain, decreases stiffness and minimises loss of function has led to its being named the 'operation of the century'.<sup>1</sup>

Lateral direct approach was first introduced in 1954, and was modified in 1982 based on the observation that the gluteus medius muscle and vastus lateralis muscle were in effective continuity through the thick tendinous periosteum covering the greater trochanter<sup>2</sup>. The incision

is started 5cm proximal to the tip of the greater trochanter and extended downward while being centred on the greater trochanter down along the line of the shaft of the femur. The fascia lata is incised and split along the line of the incision to expose the gluteus medius muscle. The muscle dissection is carried by splitting the bulk of the gluteus medius muscle between the anterior one-third and the posterior two-thirds to decrease the damage to the abductors as much as possible. The joint capsule is then exposed and incised in a T-shaped incision to expose the femoral head<sup>3</sup>.

The current study was planned to evaluate patients' functional outcomes after THA through the direct lateral approach.

### Patients and Methods

The prospective, observational, descriptive study was conducted at Al-Yarmouk Teaching Hospital, Baghdad, Iraq, from May 2019 to June 2020. After approval from the ethics review committee of the College of Medicine, Mustansiriyah University, Baghdad, the sample was raised using a convenience sampling technique. Those included were patients aged 28-81 years having advanced OA (grade 4)<sup>4</sup> with pain, avascular necrosis (AVN) (stage 4)<sup>5</sup> and Dorr classification type A<sup>6</sup> who underwent cementless THA. Patients with post-traumatic neck femur fracture, dysplastic hip, inflammatory arthritis, neuromuscular diseases, pathological fractures, previous

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surgery, and previously operated hip were excluded, and so were those who were lost to follow-up.

After taking informed consent, all patients were subjected to THA by the same surgical team. The patients were evaluated in the OPD peri-operatively. Detailed history was taken and a complete physical examination was carried out pre-surgery. Anteroposterior hip X-rays were done, and pre-operative total hip templating was done for each case to decide the size of each component of the prosthesis.

Chest X-ray (CXR) and electrocardiogram (ECG) were done, and laboratory work-up included haemoglobin (Hb) level, white blood cell (WBC) count, blood glucose, blood urea, serum creatinine and virology screen. Besides, a sample of 2 pints of cross-matched blood was prepared for each patient.

Exclusion of local skin infection, such as boils and marking of the operation site was done pre-operatively, while systemic antibiotic (3rd-generation cephalosporin 1gm) was given 1h before skin incision as prophylaxis.

All the patients underwent cementless THA by the direct lateral surgical approach<sup>2</sup> (Figure 1). All the patients received antibiotics, analgesics and medical antithrombotic measures in their respective wards. On the day after the surgery, the patients were allowed to get up from the bed as the pain subsided. Subsequently, a course of physiotherapy was initiated, and the patients started to walk with the use of aids.

The follow-up criteria included post-operative dislocation, surgical-site infection (SSI), Harris hip score (HHS)<sup>7</sup>, Trendelenburg sign and heterotopic ossification. HHS score was categorised as <70 = poor function, 70-90 = fair, 80-89 = good and 90-100 = excellent functions (Figure 2).

Every patient was followed up one week post-operatively for a wound checkup, followed by removal of stitches two weeks after that. Clinical evaluation was done after another 2 weeks, and then monthly for 6 months post-operatively.

Data was analysed using Excel version 2019. The t-test was used to determine the presence or absence of a significant association between pre-operative and post-operative HHS. A confidence level of 95% was used, and  $p < 0.05$  was considered significant.

## Results

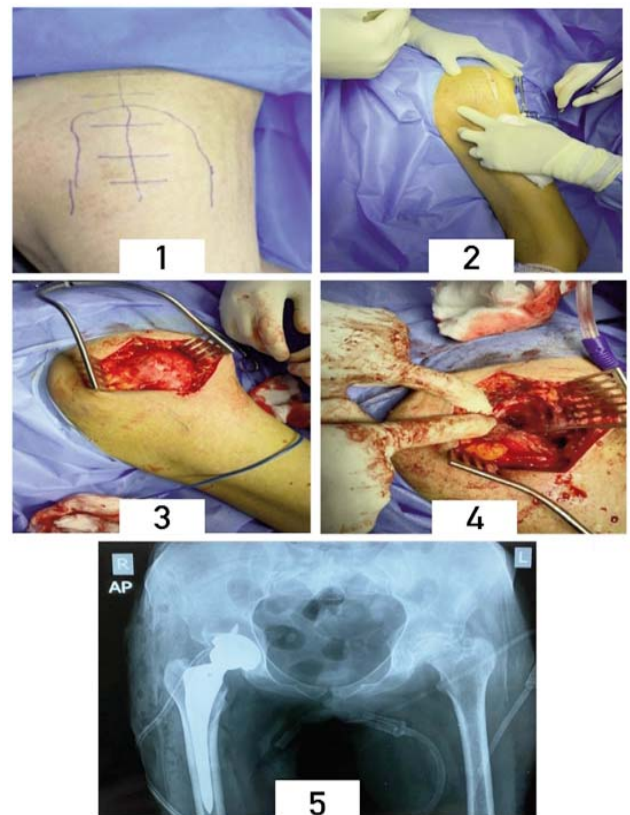
Of the 34 patients enrolled, 2(5.9%) were lost to follow-up due to the coronavirus disease-2019 (COVID-19)

**Table-1:** Demographic and clinical data.

Variable	Number	percentage
<b>Age group</b>		
28-40years	11	36.6%
41-50years	3	10%
51-60 years	8	26.6%
>61years	8	26.6%
<b>Sex</b>		
male	14	47%
female	16	53%
<b>Site</b>		
right	12	40%
left	18	60%
<b>Cause</b>		
AVN	16	53%
O. A	14	47%

AVN: Avascular necrosis, OA: Osteoarthritis .

pandemic-related lockdowns, and 2(5.9%) died. The study, as such, was completed by 30(88.2%) individuals; 14(47%) males and 16(53%) females (Table), with overall mean age  $49.8 \pm 15.28$  years.



**Figure-1:** Patient positioning, skin marking, superficial , deep dissection and post-operative radiograph.

<b>Harris Hip Score</b>	<b>Hip ID:</b> _____
	<b>Study Hip:</b> <input type="checkbox"/> Left <input type="checkbox"/> Right
	<b>Examination Date (MM/DD/YY):</b> / /
	<b>Subject Initials:</b>
<b>Medical Record Number:</b> _____	
<b>Interval:</b> _____	
<b>Harris Hip Score</b>	
<b>Pain (check one)</b> <input type="checkbox"/> None or ignores it (44) <input type="checkbox"/> Slight, occasional, no compromise in activities (40) <input type="checkbox"/> Mild pain, no effect on average activities, rarely moderate pain with unusual activity; may take aspirin (30) <input type="checkbox"/> Moderate Pain, tolerable but makes concession to pain. Some limitation of ordinary activity or work. May require Occasional pain medication stronger than aspirin (20) <input type="checkbox"/> Marked pain, serious limitation of activities (10) <input type="checkbox"/> Totally disabled, crippled, pain in bed, bedridden (0)	<b>Stairs</b> <input type="checkbox"/> Normally without using a railing (4) <input type="checkbox"/> Normally using a railing (2) <input type="checkbox"/> In any manner (1) <input type="checkbox"/> Unable to do stairs (0)
<b>Limp</b> <input type="checkbox"/> None (11) <input type="checkbox"/> Slight (8) <input type="checkbox"/> Moderate (5) <input type="checkbox"/> Severe (0)	<b>Put on Shoes and Socks</b> <input type="checkbox"/> With ease (4) <input type="checkbox"/> With difficulty (2) <input type="checkbox"/> Unable (0)
<b>Support</b> <input type="checkbox"/> None (11) <input type="checkbox"/> Cane for long walks (7) <input type="checkbox"/> Cane most of time (5) <input type="checkbox"/> One crutch (3) <input type="checkbox"/> Two canes (2) <input type="checkbox"/> Two crutches or not able to walk (0)	<b>Absence of Deformity (All yes = 4; Less than 4 =0)</b> Less than 30° fixed flexion contracture <input type="checkbox"/> Yes <input type="checkbox"/> No Less than 10° fixed abduction <input type="checkbox"/> Yes <input type="checkbox"/> No Less than 10° fixed internal rotation in extension <input type="checkbox"/> Yes <input type="checkbox"/> No Limb length discrepancy less than 3.2 cm <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Distance Walked</b> <input type="checkbox"/> Unlimited (11) <input type="checkbox"/> Six blocks (8) <input type="checkbox"/> Two or three blocks (5) <input type="checkbox"/> Indoors only (2) <input type="checkbox"/> Bed and chair only (0)	<b>Range of Motion (*indicates normal)</b> Flexion (*140°) _____ Abduction (*40°) _____ Adduction (*40°) _____ External Rotation (*40°) _____ Internal Rotation (*40°) _____
<b>Sitting</b> <input type="checkbox"/> Comfortably in ordinary chair for one hour (5) <input type="checkbox"/> On a high chair for 30 minutes (3) <input type="checkbox"/> Unable to sit comfortably in any chair (0)	<b>Range of Motion Scale</b> 211° - 300° (5)                      61° - 100 (2) 161° - 210° (4)                      31° - 60° (1) 101° - 160° (3)                      0° - 30° (0)
<b>Enter public transportation</b> <input type="checkbox"/> Yes (1) <input type="checkbox"/> No (0)	<b>Range of Motion Score</b> _____  <b>Total Harris Hip Score</b> _____

**Figure-2:** The main domains of Harris hip score (HHS)<sup>3</sup>.

The mean pre-operative HHS was 43.166±8.27, while it was 83.566±3.83 post-operatively ( $p < 0.001$ ).

There were 25(83.3%) patients with good post-operative HHS, 3(10%) had fair HHS, and 2(6.7%) patients had excellent post-operative HHS.

At the final follow-up, there was 1(3.33%) case of heterotopic ossification, and 3(10%) had Trendelenburg sign. There was no case of postoperative hip dislocation or infection.

## Discussion

Many surgical approaches are used in THA, and one of the most common ones is the lateral hip approach. The critics

of this approach suggest that it violates the hip abductor mass which may lead to a delay in the recovery of abductor strength.<sup>8</sup>

The current study had a 10% incidence of positive Trendelenburg test, which was in line with earlier reports,<sup>9</sup> while one study<sup>10</sup> found a higher incidence, and commented that this weakness was also due to the violation of the abductor mass.

In the current study, there was no case of post-operative hip dislocation, which agrees with one study<sup>9</sup> done in 2013, while a study<sup>11</sup> in 2017 reported a 1% incidence which is not too different from the current findings.

In the current study, the mean postoperative HHS was 83.5 which means a good outcome. A study<sup>12</sup> in 2001 reported a comparable result. Another study<sup>13</sup> using a modified direct lateral approach in THA reported mean HHS to be 93 with 90% excellent results. Muller M et al.<sup>14</sup> in 2012 also reported a good functional outcome.

The current study had a 3% incidence of heterotrophic ossification. An earlier study<sup>14</sup> reported 2.7%, while another study<sup>15</sup> found the incidence to be 3.4 %.

The current study had no incidence of post-operative infection. In a study<sup>16</sup> done in 2007, the number of revisions due to infection for Charnley prosthesis was 91/30,800 (0.6%) with the lateral approach.

**Limitation:** The sample size for this study was not scientifically calculated which could influence the power and generaliseability of the study.

## Conclusion

The lateral hip approach was associated with good post-operative hip stability and good post-operative functional outcome with low post-operative risk of infection.

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**Conflict of Interest:** None.

**Source of Funding:** None.

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