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Case report

Bridging the gap: A technique to avoid limb length discrepancy in arthroplasty for femoral neck fracture – a case report

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ABSTRACT

Equalizing limb length is of paramount importance for optimal outcome in patients undergoing hip arthroplasty(HA). Numerous techniques have been described for avoiding limb length discrepancy (LLD) in patients undergoing HA. However their applicability in patients undergoing HA for neck of femur(NOF) fractures remains questionable due to dissociation between the femur and the head. I hereby describe a novel yet simple technique for better utilization of already established techniques to avoid LLD in NOF fractures undergoing HA. After exposure of hip, the proximal head and neck fragment is extracted taking care not to damage bone at fracture site. Proximal fragment is provisionally fixed to distal fragment in a retrograde manner using 6.5 mm cannulated screws after predrilling over guide wires. Horizontal and vertical offsets are measured. The hip joint is reduced and a mark is made on greater trochanter (GT) utilizing the co-axial stitch method. The joint is dislocated & screws removed.THR is done in a routine manner taking care to establish and recreate native anatomy of hip. Limb length is ascertained utilizing the previous mark on GT. Recreation of proximal femoral anatomy helps in better utilization of already established techniques to avoid LLD and helps us to re-create the native anatomy in HA. It is simple, less time consuming and doesn't require extensive armamentarium or image guidance for its applicability. However it needs to be validated and its advantages might be undermined in old NOF fractures with resorption of the neck or in severely communited fractures.

Introduction

Total hip arthroplasty (THA) and hemi-arthroplasty improve the quality of life in elderly patients with displaced neck of femur fractures. THA has better long term survival rate and better functionality.[1–3] Equalizing the limb length in relation to the contralateral uninvolved side after the surgery is quintessential for better patient outcomes. Limb length discrepancy (LLD) leads to patient dissatisfaction and masks the excellent functional outcome of the surgery and is one of the most common reasons for litigation against orthopaedic surgeons.[4,5] Absolute equalization of limb lengths in THA is difficult.[6] However, numerous pre-operative and intraoperative methods have been described to avoid limb length discrepancy in THA.[4] Literature suggests that preoperative templating alone is unreliable to avoid LLD.[7,8] Though the intra-operative techniques are valuable in a routine THA, they are less applicable in a patient with neck of femur fracture. The fracture in the neck and the relative greater mobility of the femur with respect to the acetabulum in comparison to other cases may lead to suboptimal utilization of these techniques. I hereby describe a novel technique for better utilization of already established techniques to equalize limb length in neck of femur fractures undergoing THA.

Methodology: A 65 year old gentleman presented with a post traumatic transcervical fracture of the right femur. (Fig. 1) Considering the age and the pre-trauma ambulatory status, a decision was taken to proceed with uncemented THA for the right hip. Prior templating was done on the radiographs. An absolute shortening of 1.5 centimetres was noted clinically in supine position. After prior anesthesia clearance the patient was posted for right THA. The surgery was done under spinal anesthesia. Left lateral decubitus position was used. Posterolateral approach for the hip joint was utilized.

The technique: The provisional neck cut of the femur was not taken at this point of the surgery. (Fig. 2a) The femoral head was extracted taking care not to damage the bone at the fracture site. (Fig. 2b) The fractured proximal head & neck segment was aligned with the distal femoral neck and was fixed with "proximal to distal" guide wires along the axis of the femoral neck. (Fig. 2c) Cannulated drill bit for the 6.5 mm cannulated screws system was used and the femoral head was drilled from proximal to distal

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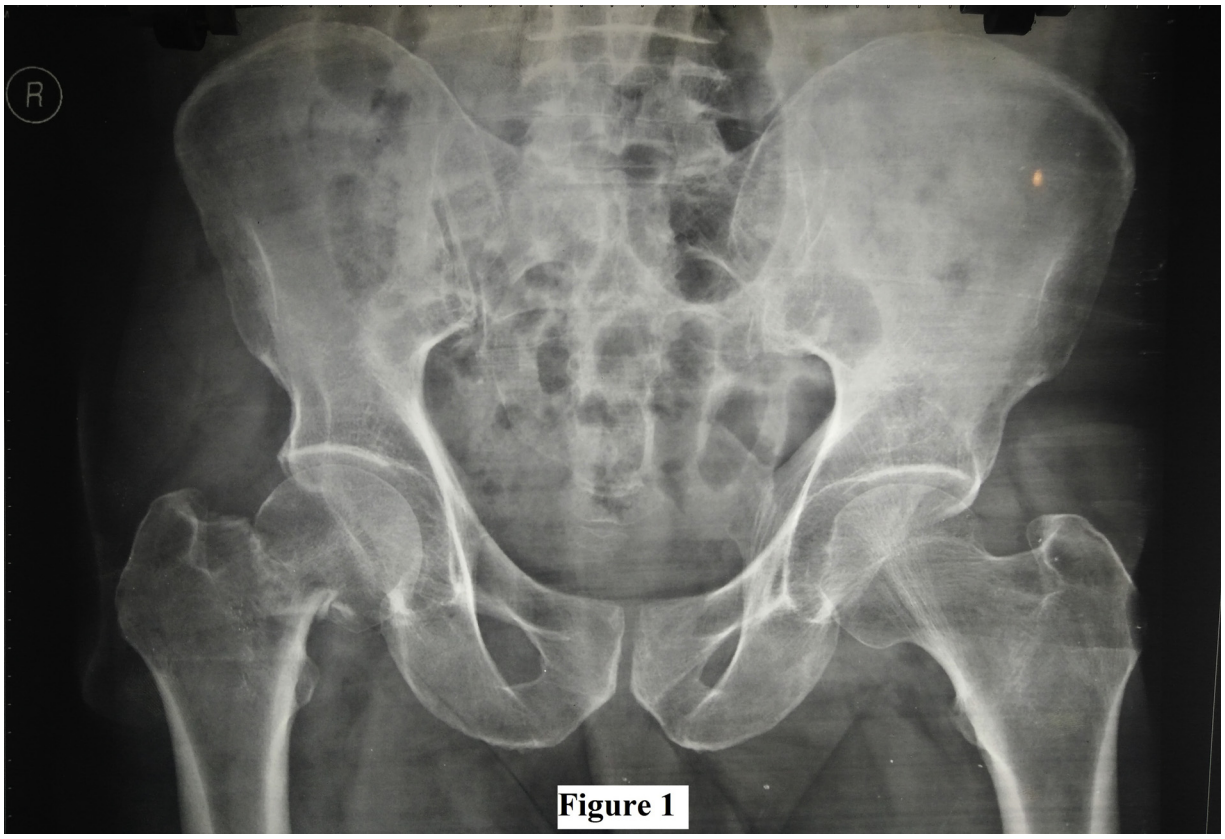

Fig 1. Pre-operative radiograph of the pelvis showing a fracture of the neck of right femur.

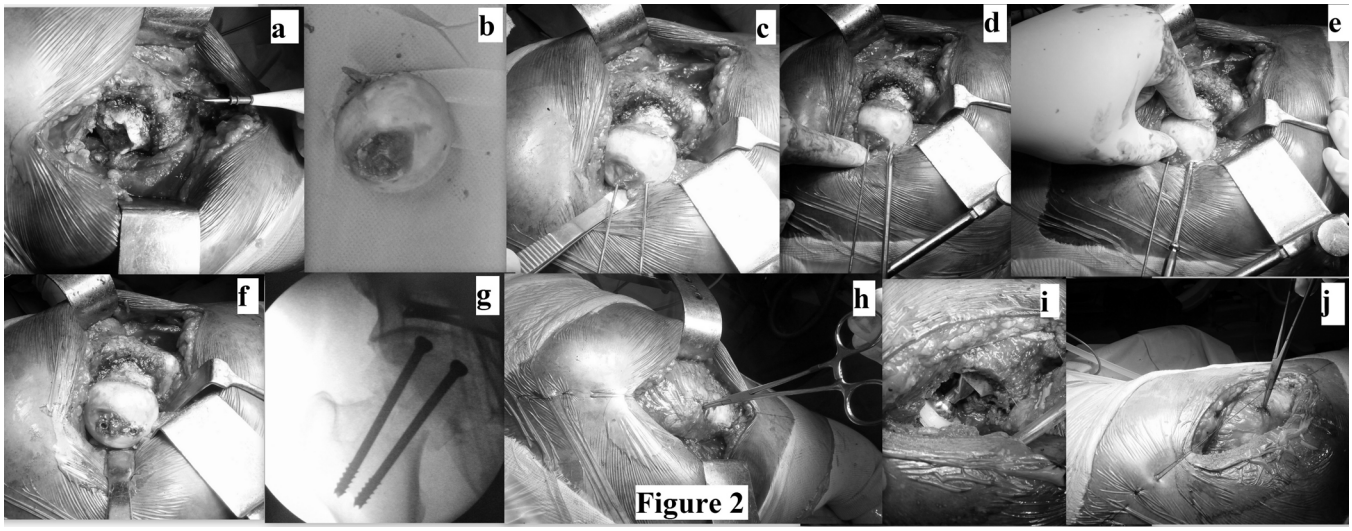

Fig. 2. The intra-operative steps.
a) Photograph showing the neck fracture.
b) Photograph showing the extracted femoral head.
c) Photograph showing the provisional fixation of the proximal fragment to the distal fragment with guide wires.
d) Photograph showing proximal to distal drilling using a cannulated drill bit for the 6.5 screw system.
e) Photograph showing the 6.5 mm cannulated screws being inserted after drilling.
f) Photograph depicting the screw heads buried on par with the femoral head cartilage.
g) Intra-operative radiograph showing the reduced hip joint with the screws in situ.
h) Photograph showing the marking on the greater trochanter after reduction of the hip joint using the coaxial stitch technique.
i) Photograph showing the final prosthesis in situ.
j) Photograph showing the re-confirmation of length with the co-axial stitch technique.

taking care not to drill the lateral femoral cortex. (Fig. 2d) The screw length was measured and two 6.5 mm cannulated screws of appropriate length were inserted from "proximal to distal" along the pre-drilled tract over the guide wires. (Fig. 2e) A countersink was used to bury the screw heads on par with the articular cartilage. (Fig. 2f) The horizontal and vertical offsets were

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