

Combo method of managing neglected fracture neck of femur

Introduction

Proximal femoral fractures are common injuries that may be caused by either low- or high-energy. Fracture of neck of femur is still the unsolved fracture because of management differs in different age groups. The treatment protocol for younger adults (<60 years old) with neglected femoral neck fractures remains controversial.¹ One of the most complications of this fracture in young and middle-aged patients is non-union. And neglected fracture neck of femur still poses a greater dilemma from treatment point of view. Important factors which are responsible for this complication are insufficient circulation of fracture site, inappropriate fixation, early weight bearing, and also anatomic position of the femoral neck and shearing forces at the fracture site. If non-union happens, the treatment depends on the situation of the femoral head (viable or nonviable). If the femoral head is viable an attempt is made to preserve the femoral head and stimulate union at the fracture site.² This purpose is achieved by performing osteotomy or fixation with fibular graft. The osteotomy can be either done in sub trochanteric or inter trochanteric region.

Here we present a case report of a neglected fracture neck of femur for which double valgus sub trochanteric osteotomy was done.

Case report

A 22 year old male, who was a military recruit, presented with limp and shortening of the right lower limb and difficulty in walking following a fall 3 months back. He had initially been managed by a quack at the time of trauma who had advised him on strict bed rest for one month. The patient had subsequently started ambulation on crutches for another two months. However, he was not able to walk long distances or climb steep slopes and had a pronounced painful limp. He had difficulty in performing activities of daily living.

On examination, range of movement of the hip was painful on the affected side and there was appreciable wasting. He was unable to do Straight Leg Raising test and telescopy was positive. The limb was in external rotation.

A radiograph of the pelvis revealed a primary non union fracture neck of femur (Figure 1). On MRI, it was found that the femoral head was viable (Figure 2).

Surgical procedure

Operative procedure was done on a standard fracture table under image intensifier control. Through anterolateral approach (Watson-Jones), the proximal femur was approached. Firstly a cannulated cancellous derotation screw was inserted through the neck into superior aspect of the neck. A 135 -degree DHS side plate was inserted and site of osteotomy was marked at the level of angle of plate by drilling a transverse K wire at that level under C-arm. Oblique osteotomy was done firstly proximally directing towards the lesser trochanter and then osteotomy was completed by oscillating bone

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saw. Predetermined size of wedge was removed. The removed wedge was morcellated and used for bone graft around the osteotomy site and nonunion field. The pointed part of the proximal part of the distal part is cut so that a triangular wedge is achieved. This is further cut in to two parts. The remaining part is docked to the proximal segment. The gap is filled with cut parts. The barrel plate was fixed with cortical screws and compression screw was inserted in the hip lag screw to compress the fracture site as much as feasible. Wound was closed in layers after leaving suction. The operation period was 150 min and the amount of blood loss was about 400 ml. Post operative radiograph was taken (Figure 3).



Figure 1 Plain radiograph showing non union fracture neck of femur Right side.

Postoperative care

The patient began active exercises of the hip and knee immediately thereafter and began using crutches within the first 24 hours of surgery. Weight bearing was delayed until healing was seen at the osteotomy

site on radiographs, usually about 6 weeks, and thereafter progressed gradually to full weight bearing, as tolerated. Patient was followed at every three month till one year. To review the results, the Harris numerical review system was used (Figure 4).

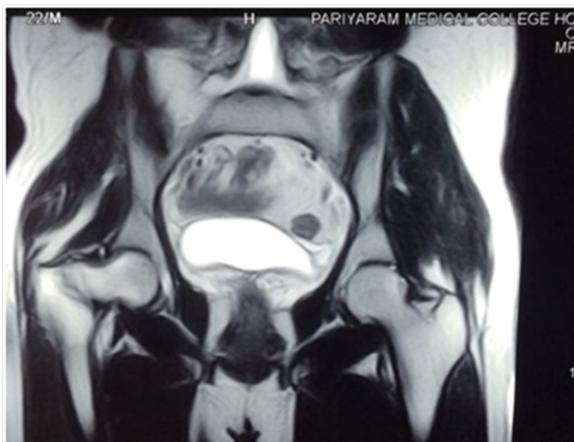


Figure 2 MRI of pelvis showing viability of Right femoral head.



Figure 3 Immediate Post-operative radiograph.

Discussion

Surgery is the best method for restoring hip function to pre fracture levels in patients with proximal femoral fractures. Sandhu et al.¹ defined neglected fractures as those fractures that are left untreated for three weeks.¹ Precarious blood supply, difficulty in reduction, strong muscle force, flow of synovial fluid, no cambium layer in periosteum and amount of posterior comminution are the main reasons for non union and avascular necrosis. Neck resorption, avascular necrosis, increased fracture gap, osteoporosis and sclerosis and small femoral head fragment make neglected fractures a bigger challenge.

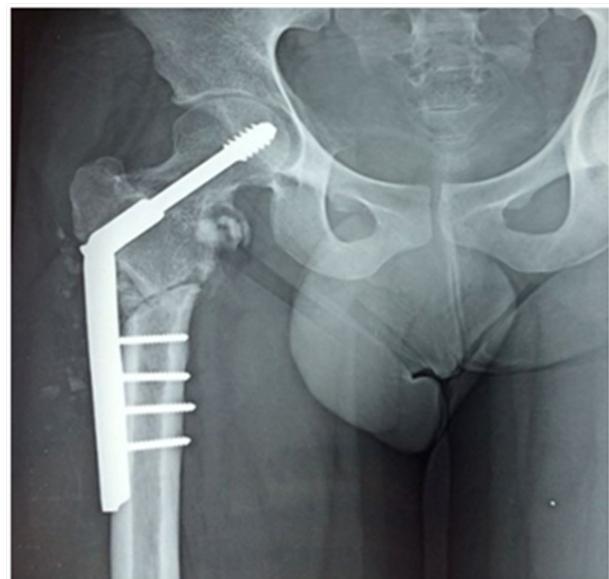


Figure 4 Post operative radiograph at 1 year of follow up.

The biomechanical principle behind Valgus osteotomy is that it converts shearing forces into compressive forces by changing the fracture inclination.³⁻⁵ Valgus osteotomy with fixation by double angle blade plate is a traditional method for the treatment of non union and for neglected fracture of femoral neck.⁶⁻⁸ In our procedure conventional 135 degree DHS plate was used and as a stable platform had been made for the fragments there was no question of any instability and neither there was any need to abduct the limb. DHS which is routinely used for inter trochanteric fractures, provides a technically simple means of fixation for valgus osteotomy in the treatment of femoral neck non union and every orthopaedic surgeon is well acquainted with its use.⁹⁻¹² Rigid internal fixation with a dynamic hip screw lessened the shearing force at the fracture site, and the use of a bone graft appeared to be beneficial for enhancing bone healing. Common problems associated with nonunion of the proximal femoral fracture include a varus neck-shaft angle, leg shortening, Trendelenburg gait, increased joint load, and abductor muscle weakness.¹³⁻¹⁶ An added advantage over blade plate is, it provides compression at the fracture site. The biological advantage of our procedure is an increase in blood flow after osteotomy which increases the chances of union. And since the graft is from local site, there is no question of morbidity.

Conventional valgus osteotomy lengthens the acetabulotrochanter distance, stretching the abductor muscle and capsules.^{17,18} As a result, hip joint pressure greatly increases, potentially compromising the vascularity within the abductor muscles and capsules. The circulation within the femoral head can be jeopardized, and avascular necrosis of the femoral head may occur despite union of the fracture and osteotomy. There is no question of this happening in our procedure. No avascular necrosis of the femoral head was noted in our case.

Acknowledgments

None.

Conflict of interest

None.