

RECONSTRUCTION OF FEMUR NECK IN NEGLECTED STAGE 3 FRACTURES IN YOUNG PATIENTS WITH DOUBLE FREE FIBULAR GRAFTS

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ABSTRACT

This case series reports the functional outcome after femur neck reconstruction in young patients after neglected femur neck fracture with free fibular grafts.

7 young patients of age 14-21 yrs with stage 3 (Sandhu et al) neglected femur neck fracture were treated with double free fibular grafting and DHS fixation. On long term follow ups all united well with good reconstruction and radiological consolidation of femoral neck on 12 months follow up with good to excellent Harris hip score. 1 patient presented with excellent, 5 with good and 1 with fair result.

This series is presented to further validate free fibular grafting in neglected femoral neck fractures in young patients, particularly those with large bone gap and to strengthen the available database.

Key words: femoral neck, neglected fracture, young, free fibular graft.

INTRODUCTION

Neglected femoral neck fracture in young patient is one of the most challenging situations among the treating surgeons. It is not rare to see such patients in our country. Most of these are from rural and semi urban areas with economic restraints and requirement of ability to squat and sit crossed leg. These patients require salvage of their own femoral head.

Femoral neck fracture is assigned neglected when more than 21 days old. Various factors come into play in planning treatment of such patients.

1. Replacement arthroplasty is not the preferred treatment in young ones, though reserved as secondary salvage procedure. High physical requirements defer the use of artificial implant at young age, preservation of own hip joint is desirable.

2. While planning fixation, following changes make planning difficult-

- Neck getting resorbed over time creating gap at fracture site.
- Fracture surface becomes smooth obscuring the guiding marks of reduction.
- With absorption of bone proximal fragment becomes smaller (especially if the fracture had been trans-cervical or sub-capital) making fixation difficult.
- Anticipated vascularity of head.

Based on these changes the fracture can be allocated to one of the following 3 stages (Sandhu et al).

Stage I

(a) Fracture surfaces are still irregular (Fresh)

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- (b) The size of proximal fragment is 2.5 cm or more
- (c) Gap between the fragments is 1 cm or less
- (d) Head of the femur is viable. There is no sign of avascular necrosis on X-ray picture or MRI or CT Scan.

Stage II

- (a) Fracture surfaces are smoothened out
- (b) The size of the proximal fragment is 2.5 cm or more
- (c) The gap between the fragments is more than 1 cm but less than 2.5 cm
- (d) The head of the femur is viable.

If either of the feature a or c is present it is allocated to stage II.

Stage III

- (a) Fracture surfaces are smoothened out
- (b) The size of the proximal fragment is less than 2.5 cms
- (c) The gap between the fragments is more than 2.5 cms
- (d) The head of the femur shows signs of avascular necrosis

If any of the feature b, c or d is present the fracture is allocated to stage III.

Most challenging situation is met with absorption of femur neck with delayed presentation when virtually no neck is left.

Femoral neck fractures presenting late with large gap at fracture site should be treated as per the principles for any other site i. e. bone grafting and stable fixation. Cancellous Iliac grafts are not suitable for this particular site as synovial fluid tend to dissolve the soft grafts. Fixation methods like multiple screws or DHS have additional consideration like small size of head, large gap at fracture site, and poor bone stock of both proximal and distal fragments and so, fixation requires additional strengthening.

Free fibular graft has been widely studied as a method to introduce both structural support and

graft framework in neglected femoral neck fractures. The free fibular graft has the advantage of being technically simple with minimal donor site morbidity, providing additional rotational stability because of its trephine shape and ease of passing it over a guide wire as it has medullary canal.

This case report included young (age 14-21 yr) patients of neglected femoral neck fractures with absorbed neck (bone gap being > 2.5cm). 6 patients were of paediatric age group (14-16 yr) and 1 adult (21 yr) who was a case of gunshot injury of hip.

We used two free fibular strut grafts with DHS to achieve good stability and adequate bone to fill the fracture area.

OPERATIVE TECHNIQUE

Patient positioned on fracture table. Anatomical reduction was not possible due to large bone gap, hence alignment of fracture fragments was done maintaining limb length and valgus angle in AP view and ante-version and alignment in lateral view under fluoroscopic control.

8 cm long lateral incision given starting from tip of greater trochanter and distally. Base of greater trochanter exposed with splitting of fascia and muscles. Three guide wire passed from base of trochanter at 135° passing through neck into the head and transfixing to acetabular wall (to get rotational stability as head fragment is usually inadequate for good hold of wires). First wire is placed centrally in both AP and lateral view. Second wire is placed proximal and parallel to first and third wire, distal and parallel to first wire. Reaming with triple reamer done over first wire appropriate size DHS screw passed over this wire.

Length of required fibular struts was calculated by measuring the protruding ends of second and third wires (and deducting from total length). Calculated length of fibula removed from the ipsilateral leg and divided to make two struts of appropriate length. Reaming with 10 mm drill done over second and third wires, up to subchondral bone of head and fibular struts passed over respective wires and gently tapped until they

engage into subchondral bone. Any protruding length of struts trimmed out. 135° barrel plate placed over hip screw and fixed to shaft. Guide wires removed and trochanteric end of fibular strut is secured with small cancellous screw / k-wire and wound closed.

Absolute non weight bearing was advised for 3 weeks then non weight bearing crutch walking started. Weight bearing was permitted only after radiological consolidation of grafts.

Patients were reviewed at 3 weeks and 2, 4, 6, 8 and 12 months.

RESULT

Out of all 7 patients treated in this way, all healed well with consolidation and incorporation of fibular grafts at 12 month follow up. Out of 7, one had excellent functional outcome while 5 had good and one (with most delayed presentation) had fair functional result. (Table).

Patient No.	Age (yr.)	Sex	Duration of fracture, At presentation	Harris hip score (at 12 mth. Post-op)	Grade
1	14	M	4 mth	85.45	Good
2	14	F	7 ½ mth	72.9	Fair
3	16	F	2 ½ mth	92.65	Excellent
4	12	F	3 mth	87.45	Good
5	15	M	5 mth	82.9	Good
6	16	F	4 ½ mth	83.45	Good
7	21	M	1 ½ mth	85.7	Good

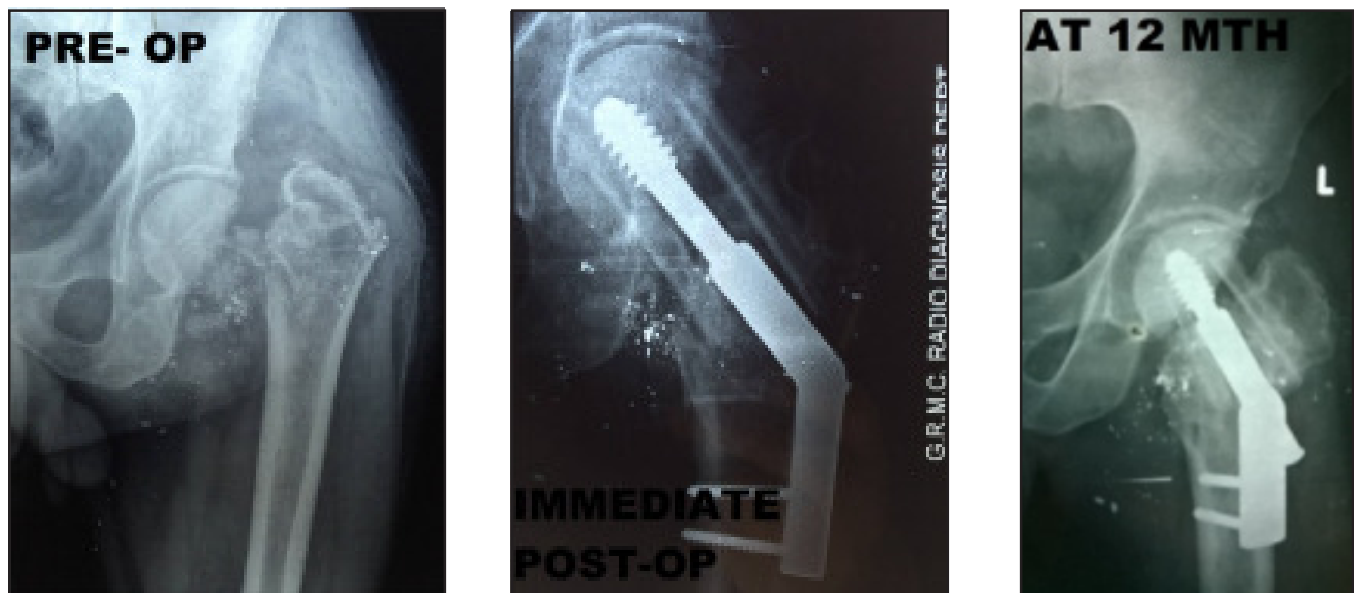


Figure 1 : Xray of a patient with neglected fracture of femur neck treated with osteosynthesis and double fibula

DISCUSSION

Neglected femoral neck fracture in young ones is difficult situation with very limited

treatment options and unpredictable outcome. Furthermore, we lack in any definitive guideline to surgically treat young particularly paediatric

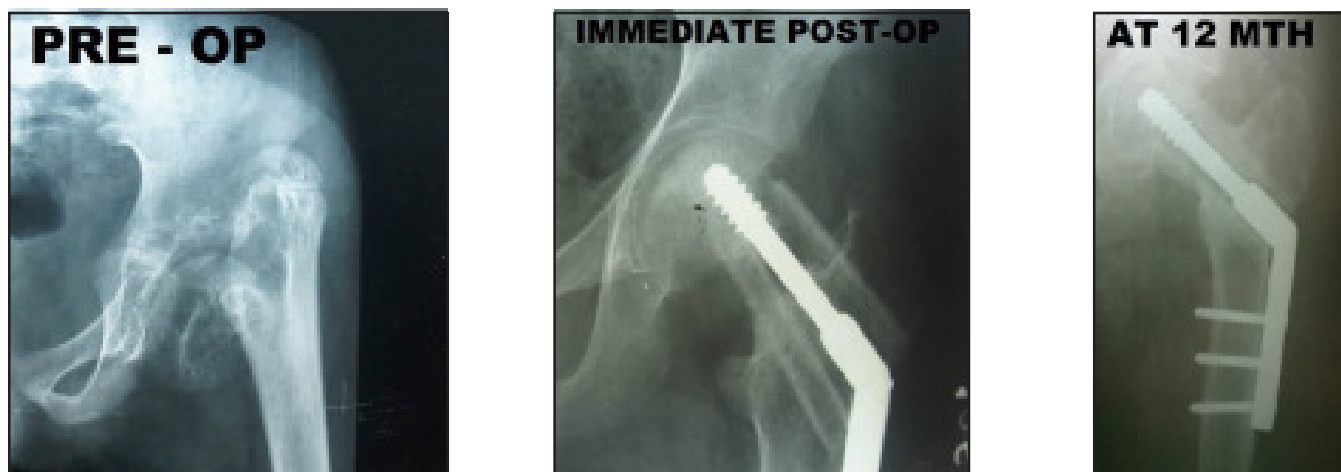


Figure 2 : Xray of a patient with neglected fracture of femur neck treated with osteosynthesis and double fibula

patients with stage 3 neglected fracture neck of femur. Free fibular grafting and internal fixation is a dependable procedure to treat such fractures. The procedure does not require special expertise and does not involve increased morbidity.

Further follow ups are awaited in present case series and more number of such cases may definitely help us further to strengthen this method as definitive treatment strategy in stage 3 fracture neck of femur.

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