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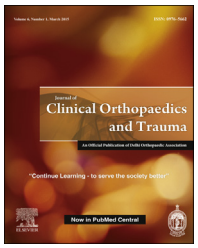

Original Article

Comparative study of fresh femoral neck fractures managed by multiple cancellous screws with and without fibular graft in young adults

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ABSTRACT

Objectives: Aim of our study was to assess the role of addition of fibular strut graft to multiple cancellous screws in functional outcome, union and complications associated with those managed by only multiple cancellous screws in fresh femoral neck fractures.
Methods: A randomized control trial study was conducted on the patients of femoral neck fractures managed with multiple cancellous screws (group A) and multiple cancellous screws with fibular graft (group B). Patients aged between 20 and 50 years, having Gardens type III or IV fracture with duration of injury less than two weeks were included in the study.
Results: Eighty seven cases were analysed n = 45 were in group A and n = 42 in group B. Functional outcome (Harris hip score) was excellent in 30 patients in group A as compared to 12 in Group B which was statistically significant favouring group A. The time of full weight bearing, union and non union rates showed no statistical significance ($p > 0.05$). On statistical grounds none of the procedures proved to be better than other.
Conclusions: Fresh femoral neck fracture in young adults managed with multiple cancellous screws fixation with fibular graft has no added advantage over multiple cancellous screws fixation alone.

1. Introduction

Femoral neck fractures are uncommon in young adult population and usually occur after significant trauma. Femoral neck fractures in patients of less than 50 years constitute about 2–3% of all femoral neck fractures.[1] Osseous and vascular anatomy, mechanism of injury, associated injuries, fracture pattern and the goals of treatment, all characteristics are considered in treatment of femoral neck fracture.[1]

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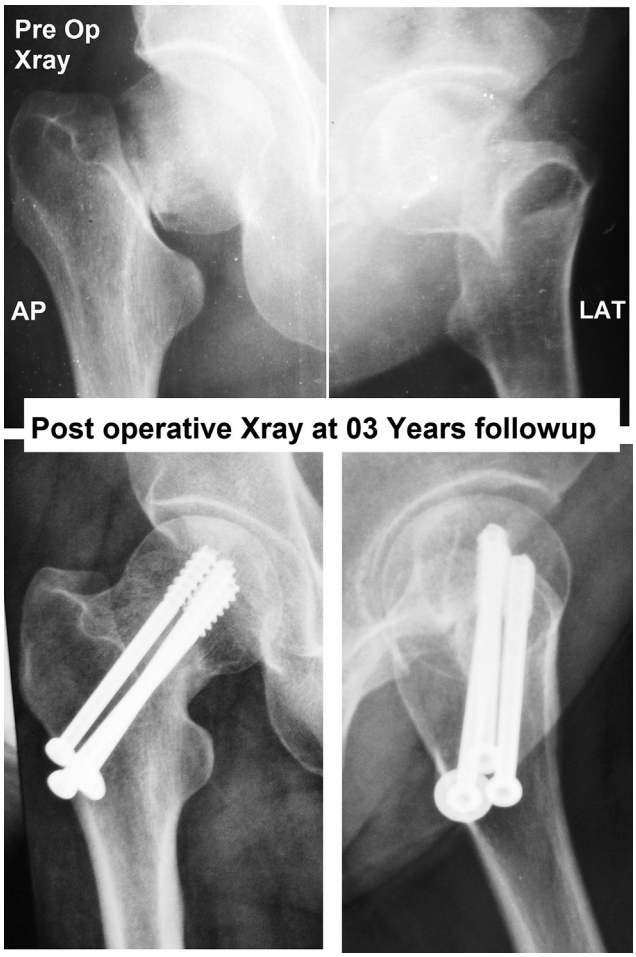

Fig. 1 – Surgical procedure in Group A.

Incidence of osteonecrosis is 20–90%, in young patients after femoral neck fracture as reported in the literature.[2,3] Various osteosynthetic procedures fixation with multiple cancellous cannulated screw, valgus osteotomy and fixation with double angle barrel/blade plate, dynamic hip screw, displacement osteotomies, muscle pedicle grafts, free fibular graft (vascularized or non-vascularized) with internal fixation are available.[4] Osteosynthesis with partially threaded multiple cancellous cannulated screw is preferred method in fresh cases of fracture neck of femur in young patients[5] with screws placed in upright or inverted triangle pattern,[6] usually in old cases fibular strut graft is used along with multiple cancellous cannulated screws to enhance union and early restoration of function.[7] In young adults fixation with multiple cancellous cannulated screws is associated with non-union (0–62%) and avascular necrosis (12–86%).[2,3] As insertion of fibular strut graft offers advantage of stability, osteoinductive and osteoconductive properties thus enhancing union,[8] it also prevents avascular necrosis[9] and collapse of head of femur.[10,11] Moreover it is technically easy to harvest the graft. Lateral radiograph of hip is not very sensitive to show the posterior comminution of neck and displaced fractures, Garden type III and IV are definitely associated with posterior comminution.[12] So we have inducted use of fibular strut graft in fresh fractures with an aim to assess the role of addition of fibular strut graft to multiple cancellous screws in functional outcome, union and related complications.

2. Material & methods

A randomized control trial was conducted at our institution from Aug.2009 to Aug.2013, on the patients with femoral neck fracture, two groups were formed, Group A was managed with multiple cancellous screws (Fig. 1) and Group B was managed with multiple cancellous screws with fibular graft (Fig. 2). Each patient was subjected to detailed clinical and radiological examination along with routine haematological investigations.

All patients between 20 and 50 years of age with Garden type III and IV fresh femoral neck fractures and duration of post traumatic fracture less than two weeks attending the Orthopaedic OPD/Emergency between August 2009 & December 2011 were included in the study.

Patients with diabetes mellitus, infection around surgical site, evidence of sequlae of septic arthritis or avascular necrosis or previous history of any surgery around affected joint, Polytrauma and fractures those requiring open reduction were excluded from the study.

A total of 100 patients were taken into the study. The patients were randomized as per random allocation table to receive either of the above operative management into group A & B respectively. Three patients required open reduction so they were excluded from the study. Four patients were lost to follow up in group A and six patients were lost to follow up in group B.

In total, 45 in group A (multiple cancellous screws) and 42 in group B (multiple cancellous screws with fibular graft) were left for analysis.

Preoperatively all patients were applied with above knee skin traction till the operation to alleviate pain and overcome muscle spasm. Preoperatively informed written consent of the patient was taken duly in all the cases. All operations were done on fracture table. The fractures were reduced by standard technique of closed methods. Reduction was confirmed with the help of C-arm image intensifier with anteroposterior and lateral views, based on the Garden's alignment index. An angle of 160°–180° in both views was considered satisfactory reduction. In group A cases after closed reduction, internal fixation were done either percutaneously or through small incision laterally with 3 partially threaded 16/32 mm × 6.5 mm cannulated or non cannulated cancellous screws out of them at least one was placed along the calcar and other along the posterior cortex. In cases of group B two teams were deployed. One surgical team prepared the tunnel in proximal femur for the fibular strut grafts using a 10 mm cannulated reamer. The other team harvested the fibular graft from the ipsilateral leg using the standard posterolateral approach. The standard lateral approach was used and after securing reduction with multiple 2 mm K wires, channel for fibula graft was prepared in central or superior part of head and neck. The fracture was fixed with two 6.5 mm partially threaded cannulated or non cannulated cancellous screws in the previously mentioned fashion and then fibular graft was duly impacted. Post operatively single POP hip spica cast was applied in all the patients