Operated and Non Operated (Neglected) Fracture Neck of Femur Treated With Intertochanteric Osteotimy

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Back Ground: The non union of femoral fracture is a vital problem in young patients. The salvage procedures and orthoclastic are unsatisfactory in theses patients. Methods to achieve osteosynthesis are more biological.

Methods: We included a series of 14 patients from June 2001 to June 2005 in Mayo Hospital, Lahore. Patients were previously treated by quacks and in some patients failure of previous fixation was seen.

Results: A total number of 14 cases of fracture neck of femur were studied. In which 10 cases were previously treated by quack and 4 cases presented with failure of fixation. In this study there were 14 patients (eight males and 6 females). The average age of patients was 30 years (14-50 years). Average duration of fracture was 7 months (2 months - 4 years) with Pauwel angel of 32.8.

Conclusion: Three cancellous screw fixations with molded and angled narrow DCP plate valgus osteotomy, autogenous bone grafting round the fracture gives good outcome in neglected fracture neck of femur if done properly.

Introduction

Femoral neck fractures in young adults have always presented a difficult problem with high rate of non union either operated or not operated (neglected) cases.[1-4] From practical point of view if fracture remains untreated for 3 weeks or more it is designated as neglected fracture because internal fixation alone has a high frequency of failure rate in such cases order to achieve union of fracture internal fixation has to combine with some type of bone graft or Osteotmy.[5]

In Western countries such cases are treated by total hip Arthoplasty because of the style and religious requirements. The people in our country are more interested to squat or sit in cross legged position. The movements required are not possible with total hip replacement. It is therefore required by all means that the God gifted hip joint should be preserved particularly in young adult. We have used the traditional Pauwal interochantec Osteotmy, adding autogenous bone grafts taken from Osteotmy site to non union site. We used molded angled narrow DCP according to requirement for operated and non operated (neglected) fracture neck in adult in our study. We have made certain modification in this procedure to suit our resources and present our experiences.

Materials and Methods

The study included fourteen cases of operated somewhere else and non operated (neglected) cases of femoral neck fractures. In operated cases, improper fixation was apparent cause of non union, and non operated case were treated by quack (Bone Setter).

The patients were divided in three groups according to Pauwal classification.[6]

All operations were carried out on fracture table under C. Arm. Direct lateral approach was used to expose the fracture site. Vastus lateralis was lifted subperiosteally after releasing it in L shape.[7] In operated cases implant used were removed and fibrous tissue were excised at the fracture site. Narrow DCP of 06-07 holes molded round to greater trochanter and angled according to the required angle of inter trochanter osteotomy. Fracture neck reduced and fixed with initially single 6.5 cancellous screws through the contoured narrow DCP[7]. At osteotomy level, we made proximal transverse cut and distal angled cuts.[7]

Pre-determined size of wedge usually of 30 degree was removed. Two more 6.5 cancellous screws through plate in the neck passed and compressed. The lower limb was abducted to align the femur to plate and reduction clamps were applied. Angled DCP was fixed to femur using 4.5 mm cortical screws. The removed bone was used as a graft around the fracture site anteriorly and posterioly.[7] Skin traction was applied to every case postoperatively for 04 weeks to avoid any implant failures as our patients were mostly illiterate and do not follow the instruction strictly. The patients were advised isometric leg exercised along with skin traction. After one month every patient was examined clinically, under C-Arm and radiologically to see sign of union. After two months, patient were mobilized with non weight bearing with walker. In 3rd months if patient is pain free on passive hip movements, radiologically satisfactory position and C-Arm shows sign of union is present, patient is asked to walk with partial weight bearing and once patient walked with confidence and there is no pain he/she was allowed full weight bearing. Patients were reviewed at 06 month, 09 month and 1 year after surgery individually.

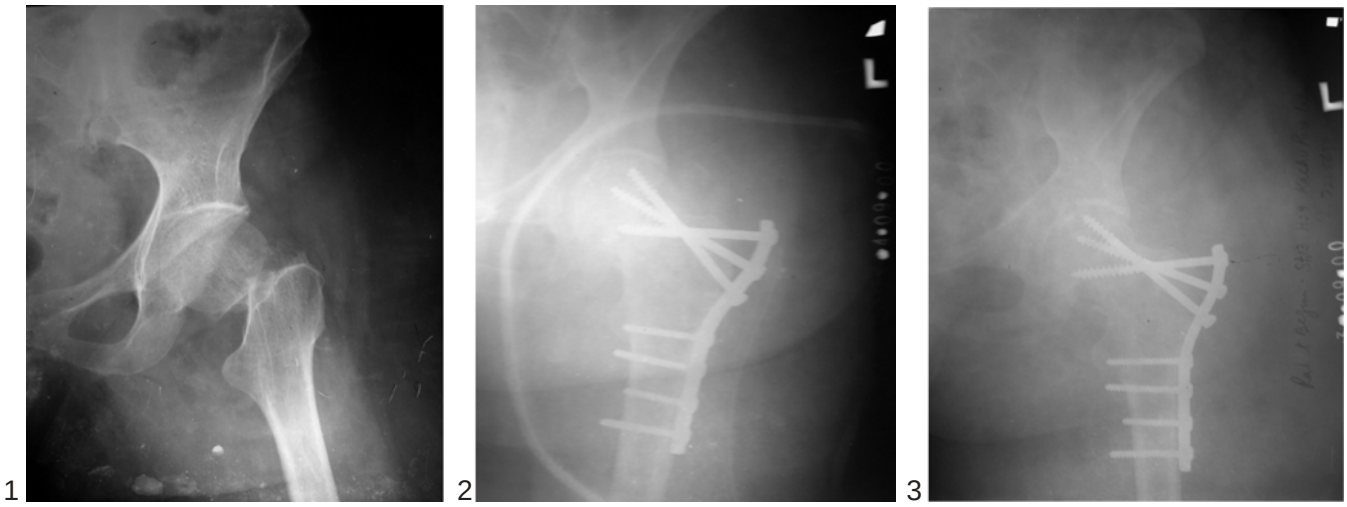

Fig. 1-3: Preoperative and post operative x-rays of one of the patients

Results

The mean age of patients was 30 years with age range 14-50 years. 8 patients were male and six were female. Ten patients were treated by Quack, one female patient got bullet injury to neck of femur and three patients improper fixation was done at district private hospital. The duration between the injury and final surgery was 07 months on average ranged from (2 months to 3 years). None of the patients had any significant medical problem. Initial radiographs of the both hips were taken, to assess the degree of neck resorption, Pawls angle and inclination of the fracture.

All the fracture showed different degree of neck resorption, but maximum resorption were found in two cases, one with bullet injury other three years old treated with DHS. No evidence of femoral head collapse was observed in any of femoral neck fracture. No special investigations were performed to detect pre collapse or avascular necroses of femoral head. There were 08 Pauwal types II and 06 type III fractures in our series.

Clinically healing was presumed to be present when the patient was pain free and was bearing full weight with out any support. Radiologically healing was determined by presence of bridging trabeculae of bone across the non union site on plain radiographs and C-Arm examination. All hip movements dynamically were visualized on C-arm examination.

One of the patients got infected after one month of surgery and girdle stone procedure was done in this case. In two cases, one with bullet injury and other 3 years old operated non union, got united after 28 weeks but follow up radiology showed subluxation of head of femur perhaps due to resorption of femoral neck. Average follow up was 18 months in 13 cases. Average time to healing of non union was 18 weeks (16- 28 Weeks). One patient who got subluxation of femoral head, complained of pain at night mostly but she walked pain free with relative good range of movements. There were no thoromboembolic complications or implant failure in our series. Functional out come was based on Askin Bryan Criteria.[8,9]

There were 7 cases with excellent results, 5 with good and 1 case was with fair results. There was poor out come in one case that got severe hospital infection and ended up in gridlestone pseudarthrosis. One operated patient showed signs of non union up till 24 weeks. These patients started walking with full weight bearing with support of walker.

Discussion

Femoral neck fracture in young adult is an emergency and the patient needs to be treated by early closed reduction and stable fixation. In our country late and neglected presentation of femoral neck fracture suggests that if fracture neck of femur is more than 2-3 weeks old then primary osteosynthesis with cancellous screw alone does not give good results.[10,11] Meyers also classified acute fracture of neck of femur on those treated up to 30 days after injury and those beyond 30 days as delayed or non union.[12]

The aim of treatment in young adult patients with non-union or neglected maltreated fracture neck of femur without apparent avascular necrosis is salvage of God gifted femoral head.

Pauwal showed that after reduction and placing the non union of fracture neck under compression by resecting the laterally based wedge osteotomy resulted in union of fracture.[7] In our procedures, we used cancellous graft taken from osteotomy site and placed around the fracture neck, and three 6.5 cancellous screws were passed through molded narrow DCP, to avoid any fracture non union of fracture neck of femur and to achieve revascularization of head of femur. Post operatively, every case was given skin traction for four week to secure fixation. Except one patient has to given skin traction for 16 weeks. We achieved union rate of 92.8%. The largest series in literature is that of Marti et al.[13]

They presented results of valgus osteotomy in 41 patients of non union of femoral neck fractures, with union rate of 86%. They experienced technical difficulties in 6 patients requiring a second surgery for re-fixation. 7 other patients required replacement due to persistent non union, late segmental collapse or implant failure at the shaft. Angelen reported 13 patients with failed internal fixation of femoral neck fracture treated with valgus osteotomy achieving a union rate of 100%.

Studies comparing blade plate with compression screw for fixation of fracture neck of femur have high rate of suboptimal position of implant, cut through and implant failure with blade plate.[14] While using blade plate, hammer impact can displace the fragments.[15] In dynamic hip screw, no doubt the implant is not hammered, but the chances of rotation of head of femur are there around DHS reamer as compared with application of three cancellous screw through molded narrow DCP give equal compression at fracture neck of femur, reduce the chance of cut through, and rotation of head of femur as well. The mechanism of hip joint shows that in one leg stance phase a load of at last three time body weight will transfer 21^{o} inferolaterally.[16]

We as a routine planed a wedge 30° as it is difficult to precisely calculate the size of wedge. This can be explained on the basis of biological as well as mechanical reasons for effectiveness of osteotomy in promoting union.[13] Avascular necrosis without head collapse has not been considered to be contraindication for valgus osteotomy. Colandruccio and Anderson considered the vascular damage at the time of fracture which decides whether or not necrosis will develop.[17] However Stromquist and Harriso used tetracycline and Isotope studies to show that vascular damage may be increased during the fixation of facture.[18]

In fresh femoral neck fractures, over correction more than 20 to 30 degree valgus or malrotation will affect the vessels and increase the chance of developing necrosis but whether this holds true in old case with resorption of neck is not clear.[18] It is also well documented that revascularization of head is possible both by artery of ligamentum teres and by vessels crossing the uniting fracture.[19]

Pre-collapse avascular necrosis is not a contraindication for valgus osteotomy in non-united fracture neck of femur. We believe further studies by non invasive means are required to evaluate effect of osteotomy on vascularity of femoral head.

Conclusion

Three cancellous screw fixations with molded and angled narrow DCP plate valgus osteotomy, autogenous bone grafting round the fracture gives good outcome in neglected fracture neck of femur if done properly.

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