

Case Report,

Biological Fixation for Segmental Subtrochanteric Fracture

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Abstract:

BACKGROUND: Surgical treatment of comminuted subtrochanteric fractures may be associated with high incidences of non-union and implant failure. Biological fixation may solve this problem by encouraging rapid callus formation. **METHODS:** In all, 4 patients with comminuted subtrochanteric femur fractures underwent indirect reduction and biological internal fixation. The mean age of the group was 38 (21-55) years. **RESULTS:** Patients were followed up for a mean of 24 (12-48) months. Union was achieved within 14 to 16 weeks, with no cases of delayed union or non-union. According to the Traumatic Hip Rating Scale, functional results were excellent in 1 and good in 3 cases. **CONCLUSIONS:** Indirect reduction and biological internal fixation yield acceptable results in comminuted fractures.

Key words: Biological fixation sub trochanteric fracture

1. INTRODUCTION

Biological fixation is a relatively new concept which is counter to the traditional ASIF principle of anatomic reduction and stable fixation. The underlying concept is protection of surrounding soft tissue and blood supply to fracture fragments. This is achieved by spanning the fracture with implants which do not significantly disrupt the fracture site. We in our study have done biological fixation for segmental Subtrochanteric fractures.

2. AIM OF STUDY

To assess the functional outcome after biological fixation for comminuted subtrochanteric fracture of femur.

3. MATERIALS AND METHODS

The study was conducted in Gokulam ortho hospital from January 2017 to August 2017. 4 cases out of 16 sub trochanteric fractures which were segmental and comminuted were included in

the study. The cases were taken up for surgery as early as possible.

The patient was put on fracture table and traction was applied. Closed reduction of fracture fragments was achieved. The trochanteric area was exposed using a small incision and lag screw as applied over a guide wire. The DCS barrel plate was then inserted below the vastus lateralis and rotated to engage the lag screw. Then the plate alignment to shaft of femur was checked under C arm.

Another small incision was made at the distal end of plate exposing the distal 3 screw holes. C arm guidance is used in deciding the distal incision level. The length and number of screw holes in plate depends on the fracture anatomy. Usually 8 hole or 7 hole plates were used. The fracture site was not exposed at all. Post operatively the cases were kept on bed for 3 weeks. After 3 weeks the cases were mobilized non weight bearing for 6 weeks. Partial weight bearing was then started and continued till fracture had united. Cases were

regularly followed up at 6 weeks interval, clinical and radiological assessment of healing was done.

4. RESULTS

4 cases were included in the study. All were males. The age group ranged from 21 years to 55 years with a mean of 38 years. All 4 cases had comminuted sub trochanteric fractures. Primary bone grafting was not done in any of cases. Fracture union was seen in all 4 cases. The average healing time was 14 to 16 weeks. All cases had united. There were no cases of non union. No case needed secondary bone grafting. None of cases had infection or implant failure. All cases were able to walk without support after 4 months.

5. DISCUSSION

Biology and biomechanics of treatment and healing of fractures interact. The model of biological internal fixation serves to highlight some of these links. The fracture disrupts the stiffness of the bone and results in painful loss of limb function. Internal fixation (surgical stabilization using implants) restores continuous stiffness, abolishes pain and allows early mobilization. Still, internal fixation, especially when carried out without care, produces damage to the vascular support of bone and soft tissues. Internal fixation has recently undergone an evolution, which sets a new balance between requirements of stabilization and of damage to blood supply. On the one hand damage to the blood supply is minimized, on the other hand induction as well as tolerance of a certain degree of instability as a result of a more flexible type of fixation type is an objective.

Biological internal fixation is a kind of surgical stabilization of the fracture that addresses the two shortcomings mentioned. The surgical procedure is geared towards minimizing damage to blood supply by avoiding excessive surgical approach abstaining from perfect reduction and absolute stability of fixation. Flexible splinting without

inter fragmentary compression then provides the natural stimulus for callus production.

Review of literature shows many studies where the principle of biological fixation has been used to treat comminuted fracture involving the femur. Most of them have reported good results. Blatter² in his study of 12 Sub trochanteric fractures treated by reduction on traction table and fixation with dynamic condylar screw has reported that in all of 12 cases fracture had healed and bone grafting was not used in any of the cases. Buamgaertel F¹ et al had reported union in 22 out of 24 cases. 2 of the cases needed secondary bone grafting. Kesemenli³ C et al had reported complete fracture healing in 15 of the 16 Subtrochanteric fractures and the mean healing time was 4.25 month. In our study we had treated 4 cases by using principle of biological fixation all four had united.

6. CONCLUSION

The biological fixation is geared towards minimizing damage to blood supply by avoiding excessive surgical approach abstaining from perfect reduction and absolute stability of fixation.

Success rate is high when technique is correctly implemented. The biological fixation principle with Dynamic condylar screw provides good functional results for comminuted sub trochanteric fractures.

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