Original Article

Results of Non Anatomical Fixation of Unstable Pertrochanteric Fracture Femur

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ABSTRACT

Objective: To evaluate the results of union in unstable pertrochanteric fracture of femur in nonanatomical reduction and fixation. **Methodology:** A descriptive study conducted at Department of Orthopaedic surgery Bahawal Victoria Hospital Bahawalpur. In the present study, we had 30 patients with unstable intertrochanteric fractures of either sex. Patients were treated by nonanatomic reduction, either by Dimon Houghsten or Sarmiento osteotomy depending upon fracture geometry, and fixed by dynamic hip screw. **Results:** Out of thirty patients, 21(70%) were male and 9 (30%) were female. The average age of male patients was 74.9 years and that of female was 61.2 years. We included patients with Jensen's type IV fractures having osteoporotic grade of four to six according to Singh's index. Patients were followed up for minimum period of 20 weeks and evaluated for radiological union and functional outcome using Sikorski and Barrington's pain and mobility scale. Out of thirty patients, only 25 completed the follow up. Four patients had limb length discrepancy. 88% of the patients had excellent to good functional outcome. **Conclusion:** Anatomical reduction must be tried in all cases. However, to avoid the complications of implant failure and loss of reduction with varus union in unstable fractures, non anatomical reduction should be considered.
Key Words: Intertrochanteric Fractures, Dimon Houghston Osteotomy, Sarmiento Osteotmy, Dynamic Hip Screw fixation.

INTRODUCTION

The intertrochanteric fractures are the most common injuries of the hip region and are more common in the elderly people. The incidence of these fractures is increasing and presently, it is about 4-5 times more common than that of femoral neck.[1] Hip fractures result in an increasing demand on orthopaedics and trauma departments and these patients usually need longer hospital stay[2]. The average age reported for the intertrochanteric fractures is 66 to 76 years. These fractures are common in females. The female to male ratio ranges from 2:1 to 8:1.[3]

The aim of the treatment is to achieve union in a good position with low morbidity and to return the patient to his or her pre-fracture activity as soon as possible. For patients who are bed-ridden or chair bound, the goal of treatment is to relieve pain. To achieve satisfactory union of these fractures, maintenance of stable reduction is the most important factor. The stability of the intertrochanteric fracture depends upon the reduction of medial cortex of the fragment, as improperly reduced medial cortices collapse into varus.[3]

At times, the posteromedial fragments of bones are difficult to reduce and under such circumstances, the desired anatomical reduction cannot be achieved. For such unstable intertrochanteric fractures, therefore, non-anatomic but stable reduction is required such as Dimon Houghston and Sarmiento osteotomy.

The main problems have been cutting out of the compression screw from the femoral head, bending or breaking of plate, pulling off plate from the shaft and varus deformity.[4,5] All these complications occur as the result of fracture fragments shifting into a more stable position to create stability at fracture site by closure of posterior and medial gaps. These

complications can be reduced by stable reduction of the fractures and using strong implant with perfect placement.[6]

The purpose of the present study is to asses the results in terms of stability of fixation, maintenance of alignment, time to union and functional outcome of non-anatomical fixation of unstable intertrochanteric fracture either by medial displacement or valgus osteotmy using dynamic hip screw and 135 side plate.

METHODOLOGY

The study was conducted on 30 patients of type IV intertrochanteric fractures, according to Jensen and Evan's classification, of either sex with age 50 years and above.

They were treated by nonanatomical reduction fixed with dynamic hip screw.

All patients were operated after stabilization, of their medical problem, if any, and getting fitness regarding anaesthesia. Nonanatomical reduction was achieved in patients on fracture table under fluoroscopic control using Dimon Housten or Sarmiento osteotomy. We used standard lateral muscle splitting approach as it is less traumatic and gives wide exposure. Check x-rays, both anteroposterior and lateral views, were taken on the same day to assess the reduction and position of lag screw in the head and neck fragment.

Patients were advised to gradually increase weight bearing while walking with the help of walker and to report 4,8,12,20 weeks postoperatively for clinical and radiological assessment.

RESULTS

Out of 30 patients 21(70%) were male and 9(30%) were female with male to female ratio of 2.3:1. The average age of male patients was 74.9 years (51-96) and average female patient age was 61.2 year (53-90).

All patients were operated on fracture table under fluoroscopic control. Dimon Houghsten osteotomy was performed in 22 patients while Sarmiento osteotomy was carried out in 8 patients. Out of thirty patients, only 25 patients (83.3%) completed the follow up.

Immediate postoperative neck shaft angle on average was 138.46 on AP view and on lateral x-rays. After fracture healing, the neck shaft angle on average was 136.46 on anteroposterior x-rays. The average healing time was 13.5 weeks. Regarding complications, one fracture united in varus position due to superior migration of the screw. Compression screw loosening was seen in only one patient.

Out of 22 patients who underwent Dimon Houghsten osteotomy, four patients developed limb length deficiency of an average of 1.6 cm.

All 25 patients, who completed the follow up were evaluated clinically for pain and mobility. 13 patients had excellent pain control, 8 had good control and 3 patients had to take analgesics occasionally and one patient was never pain free and required analgesics regularly.

Regarding mobility, 5 patients had excellent mobility, 10 patients were able to walk outside with walking aid, 6 patients were limited to home unless accompanied by some one and 3 patients required walking aid indoor while one patient was chair bound.

DISCUSSION

Unstable intertrochanteric fracture cause significant clinical problems due to both systemic and localized complications. Hip fractures have also high rates of morbidity and functional deterioration.[7] The goal of treatment is to restore the functional anatomy of the fracture, however to achieve this goal is difficult as 75% of these fractures are unstable. Varus malposition of the fracture after internal fixation is the result of the usual posteromedial comminution.[8]

The anatomic reduction is the aim but posteromedial fragment is difficult to reduce. Non anatomic reduction is achieved by changing the position of the fragments or by osteotomies.[9]

Displacement osteotomies such as Dimon Houghsten and Sarmiento osteotomies may increase fracture stability by improving increased fracture bony apposition.[10,11]

Intertrochanteric fractures are through a concellous bone due to which union is not a problem.[12] These fractures usually heal well even if deformed.[13]

Rao et al[8] had average 18 weeks healing time and Flores et al had reported union time of 10 to 12 weeks after fixation with dynamic hip screw. In our study, the average healing time was 13.5 weeks.

Pain is one of the major factors as far as functional recovery is concerned. The residual pain in intertrochanteric fracture fixed by dynamic hip screw is reported 12% by Banister et al and 9% by Kassab[13]. In our study, 84% patients had excellent to good pain control. These results are in accordance with that of Banister et al and Kassab.

Preservation of ambulatory function is the most important issue in the treatment of hip fracture. Rao et al in 124 patients reported that 48% patients walked without support while 44% required walking aid. Kassab and Jones showed that 76% of his patients were mobile in the dynamic hip screw group. In our study, 88% patients had excellent to good mobility. These results are similar to those reported by Desjardins et al[14] and Bong sc et al[15].

CONCLUSION

From the results of our study, we concluded that:

The results of Dimon Houghsten osteotomy are comparable with that of Sarmiento in nonanatomical reduction.

It is recommended that non-anatomical reduction should be considered in cases when anatomical reduction is not possible.

REFERENCES

1- Crenshaw AH. Campbell operative orthopaedic. Edited by AH Crenshaw 8th edition. Mosby USA 1992; pp 57-63, 895-907.

2- Hyse Moore GH, Mac Eachern A, Avend DCJ. Treatment of intertrochanteric fractures of femur. A comparison of the rechards screw plate with Jewett nail plate. J Bone Joint Surg 1983; 65B: 362-67.

3- Sarmiento, William EM. The unstable intertrochanteric fracture treatment with a valgus osteotomy and Jewett nail plate. J Bone Joint Surg 1970;52-A: 1309-18.

4- Wolfogang GL, Bryant MH. Treatment of intertrochanteric fracture of the femur using sliding screw plate fixation. Clin Orthop 1982; 163:148-58.

5- Davis TRC, Sher JL, Morsman A, Simpson M. Intertrochanteric femoral fracture. Mechanical failure after internal fixation. J Bone Joint Surg 1990;72-B:26-31.

6- Dimon JH, Hughston JC. Unstable intertrochanteric fracture of hip. J Bone Joint Surg 1967; 49A:440-50.

7- Apel DM, Potwardran A. Axial loading studies of unstable intertrochanteric fractures of femur. Clin Orthop1989;246:156-64.

8- Rao JP, Benzan MP, WeissAB, Rethyhack J. Treatment of unstable intertrochanteric fractures with anatomic reduction and compression hip screw fixation. Clin Orthop 1983;175:65-71.

9- Kaufer H, Mathews LS, Sonstegard D. Static fixation of the intertrochanteric fractures. A biomechanical evaluation. J Bone Joint Surg 1974; 56-A:899-907.

10- Chang WS, Zukerman JD, Kumme FJ. Biomechanical evaluation of anatomic reduction versus medial displacement osteotomy in unstable intertrochanteric fracture. Clin Orthop 1987;225:141-46.

11- Clark DW, Ribbons WJ. Treatment of unstable intertrochanteric fracture. A prospective trial comparing anatomical reduction and valgus osteotomy. Injury 1990; 21:84-88.

12- Makin M. Osteoprosis and proximal femoral fracture in elderly of Jerusalem. Clin Orthop 1987; 218: 120-23.

13- Esser MP, Kassab JY, Jones DHA. Trochanteric fracture of femur. A randomized prospective trial comparing the Jewett nail plate with dynamic hip screw. J Bone Joint Surg 1986;68-B: 557-60.

14- Desjardians AL, Roy A, Paiement G, nowarn. Unstable intertrochanteric fractures of the femur. A prospective randomized study comparing anatomical reduction and medial displacement osteotomy. J Bone Joint Surg 1993; 75-B: 445-47.

15- Bongsc, Lau HK. The treatment of unstable intertrochanteric fractures of the hip; a prospective trail of 150 cases. Injury 1981; 13(2): 139-46

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