

Research article

Outcome of external fixator in the treatment of intertrochanteric fracture in elderly patients with co-morbidities

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ABSTRACT

Background and Objectives: Incidence of intertrochanteric fracture is rising because of increasing number of elderly. They tend to have many comorbidities of different systems; therefore, major surgeries are not possible at times. In these patients, external fixator can be an option as it promotes early ambulation, thereby preventing recumbency-associated complications.

Material and Methods: Elderly patients of intertrochanteric fracture and with medical comorbidities were managed with external fixator. Functional outcome was measured by Harris Hip Score (HHS) on first post-operative day and in follow ups on 4, 12, and 24 weeks.

Results: Thrity patients (19 males, 11 females), of mean age 77.63 years (SD=9.06) were studied. HHS scores steadily increased from 37.6±5.28 on the first post-operative day to 49.43±6.9 on 4 weeks, 59.83±7.17 on 12 weeks, and 72.47±4.17 on 24 weeks. The changes were all very highly significant (all p=0.000). Mean time taken to union was 14.67±2.28 weeks. None of the patients had recumbency-related complications.

Conclusion: External fixators for intertrochanteric fractures in medically comorbid elderly patients is effective in promoting ambulation and preventing recumbency-related complications.

Key Words: comorbidity, elderly, external fixator, intertrochanteric fracture, Harris Hip Score.

INTRODUCTION

Intertrochanteric fracture is one of the most common fractures of the hip especially in the elderly with porotic bones, usually due to low-energy trauma like simple falls. Treatment goals for these patients include early rehabilitation, restoration of

anatomical alignment, and maintenance of the fracture reduction. The incidence of intertrochanteric fracture is rising because of increasing number of senior citizens with osteoporosis [1]. By 2050, the incidence is estimated to be doubled [2].

Stable fixation is the keystone of successful union of intertrochanteric fractures, but the morbidity and mortality rates are high, especially in older patients with associated medical comorbidities. Currently accepted methods of fixation for these fractures are a compression hip screw or intramedullary nail. In elderly patients with associated medical comorbidities, these major surgical procedures are undertaken only after patient is thoroughly evaluated and the medical problems addressed. Early operative treatment reduces both mortality and morbidity, giving best chance of independency and reducing the risks of complications associated with prolonged recumbency [3,4].

On the other hand, conservative methods of treatment are associated with complications of prolonged recumbency which may finally prove fatal such as hypostatic pneumonia, bedsores, deep vein thrombosis, pulmonary thrombo-embolism, and urosepsis. The mortality rate with conservative treatment is upto 60%. [5,6] The aim of treatment in the elderly patients should be to apply a surgical method that achieves minimal surgical blood loss, short operative and hospitalization time, minimal anaesthetic risk, least morbidity and mortality rates, and early weight bearing by using a stable fixation. [7]

To prevent mortality and promote early mobilization and minimise complications of prolonged recumbency, external fixation is the answer. [8] The advantages of this procedure are minimal blood loss, minimal surgical trauma and can be performed under local anaesthesia, preservation of fracture haematoma, shorter hospital stay, early ambulation of patients as compared to patients treated conservatively, and easy

removal of implant as outpatient procedure without anaesthesia.

This study aimed to find out the outcome of external fixator in intertrochanteric fractures in elderly moribund patients unfit for internal fixation.

MATERIAL AND METHODS

A prospective observational study was designed to evaluate functional outcome in elderly patients following management of intertrochanteric fractures of femur with external fixator. The study was carried out in the Department of Orthopedics, Bir Hospital, Kathmandu, Nepal from October 2011 to March 2013. Inclusion criteria were age 60 years and above and American Society of Anesthesiologists (ASA) grade IV or less. [9] Patients with fractures of ipsilateral femoral neck or shaft were excluded.

Patients attending Emergency or Out Patient Clinic for the intertrochanteric fracture were taken care of vital signs, general condition, and other associated injuries. Radiological and pre-anesthetic evaluation were performed. Operation was carried out with strict aseptic precautions under local or regional block anesthesia with sedation as necessary. After obtaining closed reduction, the fracture was fixed with two Schanz screws passing from lateral aspect of greater trochanter along the neck engaging the subchondral bone of head and two Schanz screws along the shaft which were fixed to two universal clamps and two connecting rods. Post-operatively, patients were immediately mobilized on crutches as tolerable. Patients were discharged after becoming ambulatory.

The Harris Hip Score (HHS) was employed to assess functional status. [10] Assessment was performed on first post-operative day and at 4

weeks, 12 weeks, and 24 weeks in Out Patient follow up. Mean HHS scores were compared by paired t test by SPSS statistical software version 16.0, with level of significance set at 95%.

Informed written consent was obtained from all patients to be part of the study. The study was approved by the Institutional Review Board of the National Academy of Medical Sciences, Bir Hospital, Kathmandu.

RESULTS

Altogether, the study was completed in 30 patients, 19 were males (63.3%) and 11 females (36.7%). Their mean age was 77.63±9 years. Fall while walking or from height was the common mechanism of injury and side of injury was almost equal (Table 1).

By Boyd and Griffin classification, most patients had type II fracture.[11] Preoperative anesthetic evaluation showed patients were of ASA grades II or III almost equally. Among comorbidities, cardiovascular conditions (hypertension and/or ischemic heart diseases) were most common followed by diabetes and respiratory disorders.

All patients reported within a day of injury and most patients (n=19, 63.3%) were intervened on the next day. Total duration of hospital stay ranged from 1 to 7 days. The mean HHS score on the first post-intervention evaluation (first post-op day) was 37.6±5.3 which steadily increased over the subsequent follow up evaluations (figure 1). The differences were statistically very highly significant (p = 0.000 in all comparisons, paired t test).

The average time for fracture union (radiologically confirmed) was 14.67±2.3 weeks, following which the fixator was removed in Out Patient Clinic. In 14 patients (46.7%), there were complications such as superficial pin-tract infection, varus malunion, and limb shortening >3 cm. The complications were mostly managed adequately.

There was significant negative correlation of age of patient to HHS scores at first post-operative day (Pearson’s P = -0.370, p=0.044) and 24 weeks (P= -0.492, p=0.006). There was no significant correlation of time taken for radiological union with age of patient and HHS scores at different times (p>0.05).

Table 1: Patient profile and fracture morphology

Characteristics		Number	Percentage
Comorbidity	CVS	23	76.7
	Respi	12	40.0
	Diabetes	13	43.3
	Others	4	13.3
Mechanism of injury	Fall	25	83.3
	RTA	5	16.7
Side of injury	Right	14	46.7
	Left	16	53.3
Body and Griffin classification	I	3	10
	II	25	83.3
	III	2	6.7
ASA grading	II	16	53.3
	III	14	46.7

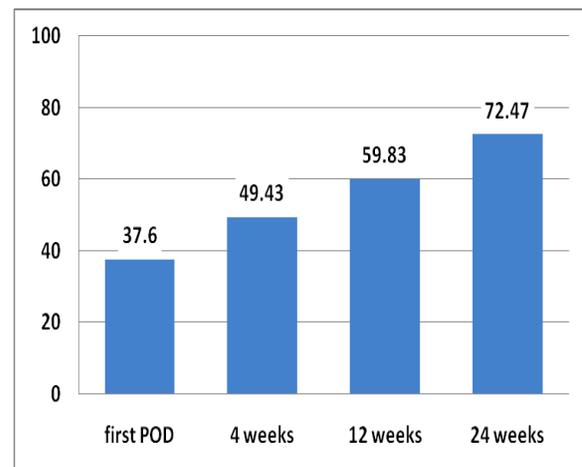


Figure 1: Mean HHS scores post-operatively and at different follow ups

DISCUSSION

Intertrochanteric fractures are a usual occurrence in older patients above 65 years of age when there is far greater loss of skeletal mass (osteoporosis). The definite treatment by internal fixation or hip replacement is at times not possible in patients with medical comorbidities. In such case, external fixation can be the useful alternative to achieve early ambulation and prevention of complications of recumbency and promoting fracture union. This study assessed the outcome of external fixation for intertrochanteric fracture in 30 elderly patients with comorbidities. The number, sex distribution, and mean age of patients in this study is comparable to most other studies.[7,8,12,13] Studies carried out in Western countries show female predominance in sustaining intertrochanteric fractures as compared to that of males.[14]

The outcome of the intervention, assessed by the HHS, improved progressively and significantly during consecutive follow ups. Also, this finding is comparable with other studies.[7,8,12] In one study, a mean HHS of 90 has been reported when patients were followed up to one year.[13] In longer follow up, the positive results of physiotherapy may also contribute to better HHS.

Radiological union was achieved at an average of 14.7 weeks in this study. This is longer duration as compared to that of Karn NK and Aly et al, where they achieved union at average of 12 and 12.2 weeks respectively.[13,15] The time taken for union had no correlations with patient characteristics such as age, gender, comorbidities, and side of the lesion. It also had no significant correlation with operative factors (time duration of operation and

preoperative delay). However, a significant negative correlation was observed between patient's age and functional outcome score (HHS). In other words, outcome of the intervention is more favorable in younger patients as compared to older patients.

Of the 14 patients who had complications, 10 had superficial pin tract infection, 2 had varus mal union, and 2 had limb shortening more than 3 cms. Most other studies have reported similar pattern of complications with the commonest complication being superficial pin tract infection.[8,12,13,16] Moroni et al used hydroxyapatite coated pins for fixation and have reported to achieve complete prevention of superficial pin tract infection.[17] However, the increased cost of the hydroxyapatite is a limitation to its widespread use. None of the patients had complications of prolonged recumbency such as deep vein thrombosis, hypostatic pneumonia, and bed sores. This could be attributed to early ambulation, which is the standard management component as well as goal of the treatment. In our study, this was effectively achieved.

CONCLUSION

External fixation in intertrochanteric fractures can be considered to be a semi-conservative method. It may be a reasonable alternative for patients who are of advanced age, have a poor general condition, and cannot tolerate long operations such as internal fixation and total hip arthroplasty. However, studies with longer period of follow up should be conducted to assess long-term effectiveness and shortcomings of the intervention.

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