



International Journal of Orthopaedics Sciences

ISSN: 2395-1958
IJOS 2017; 3(3): 865-867
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www.orthopaper.com
Received: 29-05-2017
Accepted: 30-06-2017

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Fibula hook plate as an excellent implant of choice for lateral malleolar fracture

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DOI: <https://doi.org/10.22271/ortho.2017.v3.i3l.129>

Abstract

Fractures involving the ankle are one of the most common injuries treated by orthopedic surgeons. The anatomy of the joint makes it very unstable in cases of fractures or ligamentous injuries of the ankle. As fractures of the ankle have been treated with various modes of internal fixation devices, the best possible implant is determined according to the anatomy of the fracture. Various internal fixation devices like interfragmentary screw, reconstruction plate, tubular plate have been used for lateral malleolus fracture. We studied the use of fibula hook plate for lateral malleolus fracture.

Total 40 patients were studied and were followed up post-operatively after 3 months, 6 months and 12 months. The fractures were classified according to the Lauge-Hansen classification system. Ankle score for symptom evaluation of ankle fracture by C. Olerud and H. Molander was calculated. Radiological evaluation was done by Kristenson's criteria.

Out of 40 patients, 10 patients had excellent outcome and 19 patients had good outcome. Eight patients showed fair results whereas three patients had poor results. No intra-operative complication was observed. Post-operatively six patients developed skin infection.

Anatomical reduction of ankle fractures is very important for normal weight bearing stress. The length of fibula must be maintained for this purpose. Hook plate helps to achieve this by holding the reduction of lateral malleolar fragment.

Keywords: Bimalleolar fracture, Syndesmotic and infrasyndesmotic fractures of fibula, Fibula hook plate

Introduction

The estimated incidence of all ankle fractures including isolated lateral malleolus, bimalleolar and trimalleolar fractures in world is 187 per 100,000 people each year and happen twice more often in men (2:1) [1]. The two age groups most commonly affected are young active men with high-energy trauma, and older women with low energy trauma [2]. Ankle fractures are sustained in sports activities, in traffic accidents, at home, at school or work [3]. Ankle fractures have been the subject of numerous studies and articles regarding the mechanism of injury, classification and treatment modalities.

The major goal in the treatment of ankle fracture is achieving functionally useful and stable extremity. Yet the spectrum of injuries to ankle is so wide that no single method of treatment is applicable to all fractures.

In general stable undisplaced fractures can be treated with closed methods such as a plaster cast. Unstable displaced fractures often require open reduction and internal fixation. Various internal fixation devices like interfragmentary screw, reconstruction plate, tubular plate have been used for lateral malleolus fracture. We studied the use of fibula hook plate for lateral malleolus fracture.

Materials and methods

The study was conducted at Tertiary care teaching hospital. Patients visiting the Out Patient Department of Orthopaedics and Casualty between December 2013 to July 2015 and fulfilling the following criteria were enrolled in the study. Total 40 patients including 29 males and 11 females were studied and were followed up post-operatively after 3 months, 6 months and 12 months.

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Men and women of 18 years of age or more having isolated lateral malleolus or bimalleolar or trimalleolar fractures were included in the study. Patients with open fractures, crush injury to leg, neurovascular injury or co-morbid condition were excluded from the study.

After applying the Ottawa Ankle rules^[4], patients suspected for a malleolar fracture, the next diagnostic step are plain radiographs consisting of anteroposterior, lateral and mortise views. Patients were administered adequate analgesia. Ankle dislocation if present was reduced in the emergency department. Patients were put on a below knee splintage either with a malleable splint or below knee plaster of Paris posterior slab.

The fractures were classified according to the Lauge-Hansen^[5] classification system. The patient was placed in supine position with a sand bag under the ipsilateral buttock in cases of lateral malleolar fracture. Following exsanguination, pneumatic tourniquet was inflated with time being noted. Surgical draping was done using the standard methods and the foot was covered with a hand towel or a glove.

The incision was made along the posterior margin of the fibula and carried distally curving anteriorly at the level of the lateral malleolus. The skin flaps are elevated carefully to protect the lesser saphenous vein and the sural nerve. Lateral malleolar fixation was done in 40 cases.

The medial malleolar fracture was visualized through an anterior curved incision running longitudinally with the midpoint at the tip of the malleolus. Skin flaps were mobilized and careful dissection was carried out anteriorly in order to protect the great saphenous vein and saphenous nerve. Fixation was done in 30 patients. Posterior malleolar fracture was noted in 11 cases. The posterior malleolar fracture was not fixed in any of the cases as there was anatomical reduction of the fragment.

25 patients were operated within first day of the injury. 5 patients were operated between two and five days because of uncontrolled Diabetes and hypertension. Two patient was operated 10 days later due to unsatisfactory skin condition and fracture blisters. All the patients were operated under tourniquet control. The duration of surgery varied from 30 mins to 1 hour.

The implants used for the fixation of fractures were as follows:

The medial malleolus was fixed with Malleolar screws or 4mm cannulated cancellous screws in 20 cases. Tension band wiring was done in 10 cases.

The lateral malleolus was fixed with locking or non-locking fibula hook plate. [Fig.1, 2]

Syndesmotic screw was used in 16 cases.

A below knee plaster of Paris slab was applied post-operatively for 6 weeks. Patient was mobilized on the first post operative day, non weight bearing on the affected leg with the help of walker or auxiliary crutches. Patients were discharged on the fifth day on an average. Patients with syndesmotic screw fixation were admitted on a day care basis and the syndesmotic screw was removed after 6 weeks.

Patients were evaluated functionally by ankle score for symptom evaluation of ankle fracture by C. Olerud and H. Molander^[6]. Patients were then divided into four groups:- Poor: 0- 30, Fair: 31- 60, Good: 61- 90, Excellent: 91- 100.

Pre-operative and post operative radiological evaluation was done by Kristenson's criteria^[7].

Results

In our study of 40 patients, 20 patients (50%) were from age group 21-30. Mean age of the patients was 36. Males (72.5%) were more commonly involved than females (27.5%).

Out of 40 patients, 18 patients (45%) had supination external rotation injury, 12 patients (30%) had pronation external rotation injury followed by supination adduction and pronation abduction.

Twenty one patients (52.5%) sustained the injury due to road traffic accident followed by 13 patients (32.5%) with domestic slipping.

By Kristenson's radiological grading, 30 patients (75%) had good results followed by 10 patients (25%) with fair results [Fig.5]. Ankle score was found to be good in 19 patients (47.5%) followed by excellent results in 10 patients (25%).

The complications encountered were delayed wound healing and dehiscence in 6 patients. The wounds of four patients healed at three weeks with regular dressings. Two patients required split skin grafting due to skin necrosis. Those who required SSG were the ones who had fracture dislocation.



Fig 1: Fibula hook plates of various sizes

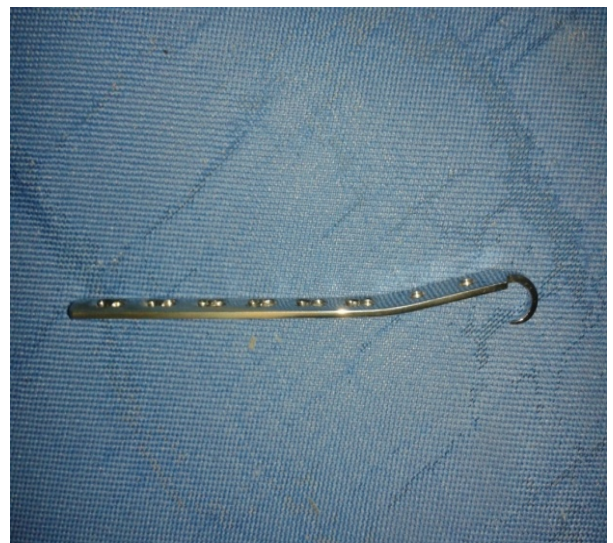


Fig 2: Fibula hook plate in side view showing prominent hook for the tip of lateral malleolus

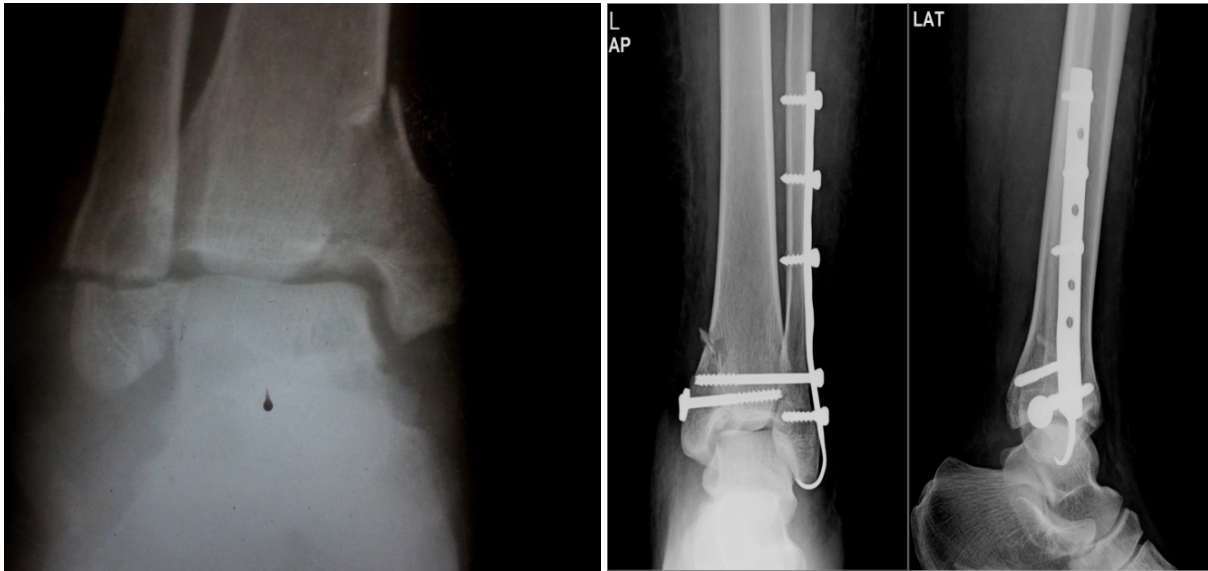


Fig 3: Pre-operative and post-operative radiograph

Discussion

Fractures of the ankle being articular in nature needs accurate reduction if residual pain and disability are to be avoided and the incidence of arthritis is to be reduced. The anatomical restoration of fibular length, alignment and rotation is important for accurate syndesmotic reduction^[8]. The present study suggests anatomical reduction of the fracture and restoration of the joint congruity of the ankle at the earliest. The hook of fibula hook plate helps to achieve and maintain the reduction, particularly in syndesmotic and infrasynesmotic fractures of fibula.

The mean age in our series was noted to be 36 yrs with a male predominance of 72.5%

Pre-operatively kristenson's grades were fair in 50% patients and poor in 37.5% patients. Post-operatively grades improved to be good in 75% patients and fair in 25% patients. Ankle score which evaluated patients on the basis of pain, stiffness, swelling, stair climbing, running, jumping, squatting and activities of daily life was found to be excellent in 10 patients and good in 19 patients.

The post operative immobilization in a plaster slab or a cast upto six weeks does not affect the final outcome with respect to achieving the ankle and subtalar range of movements as most of the patients had achieved full range of motion at the end of 12 weeks.

Conclusion

Fibula hook plate was used which not only helped to achieve the reduction but to maintain it in proper position; especially in syndesmotic and infrasynesmotic fractures.

Our series encourage operative intervention of bimalleolar fractures of the ankle with fibula hook plate as the key for high percentage of favourable outcome.

References

1. Daly PJ, Fitzgerald RH Jr, Melton LJ, Ilstrup DM. Epidemiology of ankle fractures in Rochester, Minnesota. *Acta Orthop Scand.* 1987; 58:539.
2. Mehta SS, Rees K, Cutler L, Mangwani J. Understanding risks and complications in the management of ankle fractures. *Indian J Orthop.* 2014; 48:445-52.
3. CJHM van Laarhoven. Fractures of the ankle joint. Retrospective and prospective studies on the (long-term)

results of protocolled treatment. Dissertation. Utrecht, The Netherlands, 1994.

4. Stiell IG, McKnight RD, Greenberg GH, McDowell I, Nair RC, Wells GA, *et al.* Implementation of the Ottawa ankle rules. *JAMA.* 1994; 271:827-32.
5. Lauge-Hansen-Rockwood and Greens fractures in adults, fourth edition, 1996, p 2201.
6. Olerud C, Molander H. A Scoring Scale for Symptom Evaluation after Ankle Fracture. *Arch Orthop Trauma Surg* [Internet]. 1984; 103(3):190-4.
7. Sahu R. Results of percutaneous rush pin fixation in distal third fibular fracture: A retrospective study. *African J Trauma* [Internet]. 2014; 3(1):17.
8. Scolaro JA, Marecek G, Barei DP. Management of Syndesmotic Disruption in Ankle Fractures. *JBJS Reviews.* 2014; 2(12).