



SURGICAL MANAGEMENT OF BIMALLEOLAR FRACTURES OF ANKLE JOINT

Orthopaedics

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ABSTRACT

BACKGROUND: Ankle joint is highly congruous and any disturbance of the normal articular relationship results in arthrosis. Malleolar fractures are one of the most common fractures in orthopaedic traumatology. Determination of ankle stability is critical when planning fracture management. Stable fractures can be treated conservatively with good results but unstable fractures have better outcome with surgical treatment. As with all intra articular fractures, malleolar fractures need accurate reduction and stable internal fixation.

METHODS: Thirty patients with fresh bimalleolar fractures were studied. Then the patient's radiographs were taken, both anteroposterior and lateral views of the ankle joints. Patients were put on a below knee pop slab to alleviate pain. The fractures were classified based on Lauge-Hansen's classification.

RESULTS: Supination external rotation type was the most common constituting 40% of the cases. Most common complication faced was postoperative skin infection in 10% patients. At the end of the study excellent to good results were seen in 23 (76.7%) cases, 6 (20%) cases had fair results and 1 (3.3%) had poor result.

KEYWORDS

Bimalleolar; Supination External rotation; Tension band wiring

INTRODUCTION

Ankle injury is the most common weight bearing orthopaedic musculoskeletal trauma encountered in emergency medicine and practice¹. There is an increase in the incidence of ankle fractures in the geriatric population due to increased propensity to fall and obesity. Ankle joint is highly congruous and any disturbance of the normal articular relationship may result in some progressive arthrosis of biomechanical dysfunction¹. In the clinical setting determination of ankle stability is critical when planning fracture management. Stable fractures can be treated conservatively with good results although outcomes in the management of unstable ankle fractures are often better with surgical treatment. The superiority of open reduction and internal fixation (ORIF) over closed treatment has been thoroughly demonstrated in literature². Malleolar fractures are one of the most common fractures in orthopaedic traumatology. As with all intra articular fractures, malleolar fractures necessitate accurate reduction and stable internal fixation.

MATERIALS AND METHOD

Thirty patients with fresh bimalleolar fractures who attended to casualty in our hospital were studied. As soon as the patients were brought complete survey was carried out to rule out significant injuries. Then the patient's radiographs were taken, both anteroposterior and lateral views of the ankle joints.

The fractures were classified based on Lauge-Hansen's classification in adults. Following complete evaluation, patients were operated as early as possible once the general condition was stable and patient was fit for surgery.

RESULTS

All the patients were followed until fracture union occurred. Results were analysed both clinically and radiographically. Almost all fractures united at the end of 12 weeks.

In our study, majority of patients i.e. 14 (46%) were from 40-60 years age group followed by 12 (40%) patients in 20-39 years age group and males 22 (73.3%) patients compared to females 8 (26.7%).

The major cause of fracture in our study was road traffic accident (RTA) in 15 (50%) and in 13 (43.3%) patients, fracture was due to slipping and stumbling.

In the present series 12 (40%) patients had Supination External rotation injuries which is the majority followed by 6 (20%) patients having Pronation Abduction and 4 (13.3%) patients had Supination Adduction. 5 (16.7%) had Pronation External rotation. Remaining 3 (10%) patients had Pronation Dorsiflexion injury.

Most of the patients were operated between 2 and 5 days under spinal anesthesia. Average duration between trauma and surgery was 3 days in our series.

IMPLANTS USED

Medial malleolus:

Lag screw	23(76%) cases
Tension band wiring	7(23%) cases

Lateral malleolus:

Semi tubular plates	27(90%) cases
Tension band wiring	3 (10%)cases

TABLE 1: Final score according to subjective, objective and radiological criteria

Category	Grade A	Grade B	Grade C	Total
Pain	13	14	3	30
Stability	30	-	-	30
Walking	25	5	-	30
Running	18	10	2	30
Work	25	5	-	30
Motion	20	8	2	30
Radiography	27	2	1	30

In this series 13 (43.3%) had no pain (GRADE A) and 14 (46.7%) patients had pain i.e. with strenuous activities (GRADE B) and remaining 3 (10%) had pain i.e. activities of daily living (GRADE C). All the patients had no clinical instability (GRADE A). Majority i.e. 25 (83.3%) of patients could walk desired distances without limp or pain (GRADE A) and 5 (16.7%) patients were able to walk desired distance with slight pain (GRADE B). Eighteen (60%) patients were able to run desired distances without pain (GRADE A), 10 (33.3%) patients were able to run desired distances with slight pain (GRADE B) and 2 (6.7%) patients had moderate restriction in ability to run with mild pain (GRADE C). In our series 25 (83%) patients were able to perform usual occupation without restriction (GRADE A) and the rest 5 (16%) patients were able to perform usual occupation with restriction in some

strenuous activities (GRADE B). In this series, 21 (70%) patients had range of motion of the ankle within 10° of uninjured ankle (GRADE A) and 7 (23%) patients were having motion within 15° of uninjured ankle (GRADE B). The rest 2 (6%) patients had motion within 20° of uninjured ankle (GRADE C).

TABLE 2: Composite score

Composite score	No. of patients	Percentage
Excellent (96-100points)	13	43
Good (91-95 points)	10	33
Fair (81-90 points)	6	21
Poor (0-80 points)	1	3
Total	30	100

In the present study of 30 patients with bimalleolar ankle fractures treated by ORIF, excellent results were achieved in 13 (43%), good in 10 (33%), fair in 6 (20%) and poor in 1 (3%) of patients. The patients with poor result had mild pain with activities of daily living, diminution in the abilities to run/work, reduced ankle movements and decreased joint space.

Four patients had superficial skin infection which healed by 3 weeks. There were no other complications.

DISCUSSION

Ankle fractures being Intraarticular need accurate reduction if residual pain, disability and the incidence of arthritis has to be avoided.

Treatment of malleolar fractures with accurate ORIF gave good results. This study supports these conclusions.

The mean age of this study was 40 years. This finding was similar to observation of Burwell and Charnley⁷.

The commonest mode of injury was RTA in the present study which is similar to the study of Lee et al.⁵ with maximum no. of cases (115) from RTA/Vehicular accident.

In the present study Lauge Hansen's classification system was used for operative evaluation. The most common type of injury was Supination-External rotation type (40%) which is similar to studies by Gregory Joy et al.⁵ with 41% cases and Burwell and Chornney³ with 46% cases.

The outcome of treatment in Song KJ et al.⁶ showed good to excellent results in about 89% (32) of cases and Frank Wilson and Arne Skilbred⁷ had excellent to good results in forty-two (77%) and only one had poor result which is comparable with our study where good to excellent results were obtained in 76% of patients, fair result in 20% and poor in 3% of patients.

The type of the fracture did not affect the final outcome in the present study as it did in the study of Bistrom.⁸ But the study supports the view of Klossner and Kristensen⁹, according to which reduction determines the final clinical result irrespective of the type of fracture.

Early mobilisation was advocated by AO and immobilization has also been supported by many. Others have found no significant difference in results produced by early motion or immediate plantar splintage. In this series, post-surgery immobilization with a below knee plaster cast was given for four weeks followed by active mobilisation of joint for two weeks then partial weight bearing and by the end of 10 weeks complete weight bearing was allowed. Ahl et al.¹⁰ showed that early weight bearing in a plaster cast had a tendency to display better clinical results, he also found that addition of ankle movements using orthosis showed better results.

According to Makwana¹¹ the risk of complications after internal fixation is low but higher than with closed treatment. Most of the complications were minor and resolved within 3 months. In our series there were no malunion or non-unions of either medial or lateral malleolus.

CONCLUSION

We found that majority cases were Supination External Rotation type injuries, following RTA. Understanding the mechanism of injury is

essential for good reduction and internal fixation. Fibular length should be maintained for good ankle stability. Tension band wiring is preferred in small and osteoporotic bone fragments.

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