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A Study on Clinical Profile of Patients with Bimalleolar Ankle Fractures Attending Tertiary Care Hospital

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ABSTRACT
The ankle joint is subjected to enormous forces across a relatively small surface area of contact, with up to 1.5 times body weight with gait and greater than 5.5 times body weight with more strenuous activity. Maintaining congruency of the ankle joint is therefore critical to the long-term viability of the ankle. As soon as the patients were brought to the casualty/opd a detailed examination was carried out to rule out significant injuries. Then the patient's radiographs were taken, both anteroposterior and lateral views of the ankle joints. On admission to the ward detailed history was taken relating to the age, sex, occupation, address, mode of injury, past and associated medical illness, patients general condition was assessed. In our study of bimalleolar ankle fracture both right and left ankle were fractured in similar numbers of subjects (15:15). Domestic slipping and twisting, followed by Road traffic injuries were the most common cause of injury in our study.

INTRODUCTION

The ankle joint is a hinge joint, the lower end of the tibia and its medial malleolus, together with the lateral malleolus of the fibula and the inferior transverse tibiofibular ligament form a deep recess (mortise) to articulate with the body of the talus. The ankle joint has a strong medial collateral (deltoid) ligament which is triangular in shape., it is made up of the tibionavicular, tibiocalcaneal and tibiotalar (anterior and posterior) ligaments. Injury to the deltoid ligament is commonly associated with distal fibula fractures[1]. The lateral ligament has 3 parts, the anterior talofibular ligament, the posterior talofibular ligament and the calcaneofibular ligament. The lateral ligament is commonly injured with inversion sprains. The inferior tibio fibular ligament is usually considered a syndesmosis, consisting of the anterior and posterior tibio fibular ligaments and the interosseous ligament. The ankle joint receives its blood supplied from the anterior and posterior tibial and fibular arteries[2]. The joint is innervated by branches from deep fibular, saphenous, sural and tibial nerve. Factors maintaining stability. Passive stability is mainly achieved by the medial and lateral ligament complexes, tibiofibular ligaments, tendons crossing the joint, bony contours and capsular attachments[3]. Dynamic stability is usually conferred by gravity, muscle action and ground reaction forces. Stability requires the continuous action of soleus assisted by gastrocnemius, it increases on leaning forward and decreases on leaning backwards. The posterior malleolus acts as a restraint against posterior translation of the talus, and fractures involving approximately 25% of the articular surface will result in posterior instability[4]. The ankle joint is subjected to enormous forces across a relatively small surface area of contact, with up-1.5 times body weight with gait and greater than 5.5 times body weight with more strenuous activity. Maintaining congruency of the ankle joint is therefore critical to the long-term viability of the ankle[5,6].

MATERIALS AND METHODS

All patients attending outpatient department of orthopaedics and patients admitted in department of orthopaedics between 18 years to 65 years of both sex, presenting with bimalleolar ankle fractures who are willing to undergo surgery were enrolled for the study after obtaining the written informed consent from patient and their attenders. Follow up at 1 month, 3months and 6 months interval. As soon as the patients were brought to the casualty/OPD a detailed examination was carried out to rule out significant injuries. Then the patient's radiographs were taken, both anteroposterior and lateral views of the ankle joints. On admission to the ward detailed history was taken relating to the age, sex, occupation, address, mode of injury, past and associated medical illness, patients general condition was assessed.

Study Design: Longitudinal study.

Sample Size: All patients between 18 years to 65 years of both sex, presenting with bimalleolar ankle fractures who are willing to undergo surgery were enrolled for the study follow up at 1 month, 3months and 6 months interval. Tentative sample enrolled during the above mentioned period shall be 30 and above.

Sampling Method: Purposive sampling.

Study Period: 18 Months studies followed by follow up in 1st month, 3rd month and 6th month.

Inclusion Criteria:

- Patients of age 18-65 years of both sex.
- Displaced bimalleolar ankle fracture.
- Closed fracture.
- Radiological findings confirming bimalleolar ankle fracture under Lauge-Hansen classification.
- Patient who are willing to give informed written consent.

Exclusion Criteria:

- Below 18 and above 65 years of age.
- Compound fractures.
- Associated fractures around ankle joint and foot.
- Trimalleolar/unimalleolar fractures.
- Infections around ankle.

RESULTS AND DISCUSSIONS

Maximum number of patients in our study ranged between 41-50 years and females were predominant. Supination-External rotation injury was the most common mechanism of injury in our study as per Lauge-Hansen classification comprising up to 14 (46.66%) of the total number. In our study of bimalleolar ankle fracture both right and left ankle were fractured in similar numbers of subjects (15:15). Domestic slipping and twisting, followed by Road traffic injuries were the most common cause of injury in our study. The Fractures of the ankle being Intra-articular and in a weight bearing extremity needs accurate reduction if residual pain and disability are to be avoided and the incidence of arthritis is to be reduced. In fractures of the ankle, only the slightest variations from normal anatomy are compatible with good function of the joint. Treatment of malleolar fractures with accurate open reduction and internal fixation using AO principles was found to give good results. This study supports these conclusions. The scoring system of Baird and Jackson is a

Table 1: Distribution of Subjects is According to Gender and Age

Age in Years	No of Patients	Percentage	Male	Percentage	Female	Percentage
21-30	04	13.33%	2	18.18%	2	10.52%
31-40	05	16.66%	2	18.18%	3	15.78%
41-50	12	40.00%	4	36.36%	8	42.10%
51-60	07	23.33%	2	18.18%	5	26.31%
61-more	02	06.66%	1	09.90%	1	05.26%
Total	30	100%	11	36.66%	19	63.33%

Table 2: Type of Injury as Determined by Lauge Hansen Classification

Type	No. of patients N=30	percentage
Supination Adduction	09	30%
Supination External ratation	14	46.66%
Supination Adduction	07	23.33%
pronation External ratation	00	0%
pronation Dorsasiflexion	00	0%

Table 3: Distributions of Fractures were According to Side of Ankle Injury

Side	No of Patients n=30	Percentage
Right	15	50%
Left	15	50%

Table 4: Distributions of Injury of the Ankle were According to Cause of Injury

Causes of injury	No of Patients (n=30)	Percentage
Road traffic accident including fall from bike	11	36.66%
Domestic slipping and twisting	12	40%
Fall from height	07	23.33
Total	30	100%

Table 5: Comparison of Gender distribution with various studies

Studies	Number of patients	Male: Female	Percentage of males	Percentage of females
SSV Raman2	48	28:23	50.3	41.7
Motawani3	40	33:7	83.33	17.5
Maruthi CV6	40	28:12	70	30
Voligi Shanker8	80	45:35	56.2	43.7
Present study	30	11:19	36.66	63.33

Table 6: Comparison of Mode of Injury with other Studies

Studies	Number of patients	Commonest mode
SSV Raman2	48	RTA
Motawani3	40	RTA
Maruthi CV6	40	RTA
Voligi Shanker8	80	RTA
Present study	30	Domestic slipping and twisting

Table 7: Comparison of Side Affected with other Studies

Studies	Number of patients	Right	Left
SSV Raman7	48	21	23
Motawani8	40	25	15
Maruthi CV9	40	24	16
Voligi Shanker10	80	50	30
Present study	30	15	15

Table 8: Type of Injury in Various Studies as Determined by Lauge-Hansen's Classification

Studies	Total Number of patients	Most common type	Percentage
SSV Raman7	48	Pronation abduction	45.8
Motawani8	40	Supination and external rotation	40.6
Maruthi CV9	40	Pronation abduction	65
Voligi Shanker10	80	Supination and external rotation	37.5
Present study	30	Supination and external rotation	46.66

composite score, about 70% of patients in this series achieved excellent to good results, 26.66% achieved fair results and 3.33% achieved poor result. All had anatomical reduction of the malleoli radiologically. Female predominance observed in our series, where as in other studies male predominance observed. The commonest mode of injury in our study was domestic slipping and twisting (40%). In our study both side were equally affected. In the present study Lauge Hansen classification17 system was used for operative evaluation. The most common type of injury was supination and External rotation type.

CONCLUSION

Study shows female is more prone with age incidence of 41-50 years. Majority of them were supination external rotation injuries 14 (46.66%). The most common etiology being domestic slipping and twisting 12(40%). In our study of bimalleolar ankle fracture both right and left ankle were fractured in similar numbers of subjects (15:15).

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