

**OPERATIVE VS NON OPERATIVE MANAGEMENT OF ANKLE INJURIES – A
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ABSTRACT

Ankle is a complex weight bearing hinge joint formed by distal tibia, fibula and talus, with dorsiflexion, plantarflexion as its principal movements combined with limited rotatory and sliding capability. The joint is prone to low velocity injuries like twisting sprains, strains, osteoporotic fractures, as well as high velocity trauma like sports injuries, road traffic accidents, resulting in supination / pronation external rotation injuries and also supination adduction / Pronation Abduction injuries (Lauge-Hansen). Having understood the mechanism of injury as described by Lauge-Hansen, these injuries can be treated by closed reduction and POP Cast especially in low demand, minimally displaced fractures successfully in good percentage of cases. But, conservative method is associated with high rate of redisplacement, malunion, nonunion, stiffness, osteoporosis and secondary osteoarthritis. Because of these limitations, there is a trend to treat these unstable fractures with a more definitive treatment in the form of anatomical open reduction – internal fixation followed by fast mobilisation to achieve better functional outcome. A prospective study to compare clinical, radiological and functional outcome as per Olerud and Molander score, was done. Our study with a mean follow up of 26 months, included 140 patients, divided in two groups, A and B of 75 and 65 patients, treated by operative and non-operative methods respectively. The group A had 53 (70.6%) males and 22 (29.4%) females, compared to group B, 27 (41.5%) males and 38 (58.5%) females. Age ranged from 20 to 80 years (mean age = 29.5 gr.A and 48 gr.B). Common mode of trauma, in group A was motor vehicular accidents 45 (60%) and low energy trauma, twisting, slipping, missing a step was common 45 (61.5%) in group B. Fractures were classified as per Lauge-Hansen and there were 30 (21.4%) PER III, 28 (20%) SER IV, 25 (17.8%) PER IV, 20 (14.2%) SER III, 19 (13.5%) PER II, and 18 (13.1%) SER II. Group A, patients were mostly treated by open reduction and internal fixation, using 1-2 cancellous cannulated 4 mm screws for fixation for medial malleolus and 1/3rd tubular plate for fibular fixation. Group B, patients were treated by closed reduction and long leg POP Cast. The overall comparative results as per Olerud and Molander scoring revealed, significant superiority of operative group A over conservative Group B (p = 0.035).

KEYWORDS: Operative-non operative, Comparison, Ankle Fracture.**INTRODUCTION**

Incidence of ankle injuries is as high as five million reported per year in US (Daly PJ, Fitzgerald RH Jr, Melton LJ, *et al.* *acta Orthop Scand.* 1987). Luckily, 85% of these are ankle sprains and rest 15% are fractures. Ankle fractures constitute 9% of all fractures overall, but is commonest amongst the intra-articular fractures, hence the need for anatomical reduction and restoration of the congruity of joint surface and ankle mortise to achieve useful results avoiding secondary osteoarthritis which occurs fairly early (Court Brown CM, Caesar B 2006) Ankle injury is commonly seen in all age groups due to motor vehicle accidents, sports injuries (foot ballers), and in old and infirm. Fractures need to be recognized as stable or unstable as per various classifications available or with the help of CT or MRI.

Most authors advocate, stable fractures need minimal splintage (Ahmad HZ, Nazri MY *et al.* 2011), whereas unstable fractures need either closed reduction (Quigley), or mostly open reduction and internal fixation for predictable results. The main aim of the study was to enhance our understanding on the subject in our set up because of conflicting reports, regarding effectiveness of conservative v/s operative treatment (Larsen P, *et al* *Foot Ankle Surg.* 1918).

MATERIAL AND METHODS

This prospective study of operative versus conservative treatment of ankle fractures was undertaken in our hospital from January 2012 to December 2014. 140 adult patients with ankle fractures were divided in two groups, A and B ; Group A patients were treated

by operation and Group B treated conservatively. The results of two groups regarding, age & sex distribution, mode of trauma, skin condition, type of fracture (Lauge-Hansen), treatment given, union, swelling, pain, ankle ROM and complications were noted and compared for two groups.

RESULTS

This study was conducted in Department of Orthopaedics, Government Medical college & Hospital

Jammu. A total of 140 adult patients with ankle fractures were studied in this study and divided in two groups, A and B. Group A had 75 (53.5%) patients who were treated by operation (ORIF) and 65 patients (46.5%) of group B treated conservatively. Out of 140 patients, in Group A, 53 (70.6%) were males & 22 (29.4%) were females. 27 (41.5%) were males & 38 (58.5%) were females in Group B. Age wise distribution of patients are shown in Table 1.

Table 1: Age Wise Distribution.

Sr. No	AGE GROUPS	NUMBER OF CASES		PERCENTAGE	
		Group A	Group B	Group A	Group B
1.	20 – 40 years	35	12	46.6%	18.4%
2	40 – 60 years	25	25	33.4%	38.4%
3	60 – 80 years	15	28	20%	43.2%

GROUP A =Maximum cases belonged to(20 – 40) years age group 35 (46.6%), and in GROUP B maximum belonged to (40 to 80 yrs) 53(81.5%). MEAN Age Group A= 28.5 yrs & Group B = 48.

Table 2: Mode of Trauma.

Sr. No	MODE OF TRAUMA	NUMBER OF CASES		PERCENTAGE	
		Group A	Group B	Group A	Group B
1.	Motor Vehicle trauma	45	20	60%	30.7%
2	Sports Injury	22	05	29.3%	7.8%
3	Low velocity trauma	08	40	10.7%	61.5%

Commonest mode in Group A was MVA+ Sports = 67 cases (89.3 %).; In Group. B It was Low velocity 40 (61.5%)

Table 3: Fracture distribution pattern as per lauge – hansen.

Sr. No	MODE OF TRAUMA	NUMBER OF CASES		PERCENTAGE	
		Group A	Group B	Group A	Group B
1.	P E R III	18	12	24.0%	18.5%
2	S E R IV	20	08	26.7%	12.2%
3	P E R IV	15	10	20.0%	15.4%
4.	E R III	10	10	13.3%	15.4%
5.	P E R II	07	12	9.3%	18.5%
6.	SER II	05	13	6.7%	20.0%

Group A- high percentage of grade III,IV injuries (84) ;Group B, high percent Low velocity trauma(53.8%).

MODE OF TREATMENT

In Group A all patients were treated operatively and commonest surgical procedure adopted was open reduction internal fixation, using 1 to 2 cancellous cannulated screws for medial malleolus and 1/3rd tubular plate laterally for fibula (Fig 1 PER3 Injury) was done in 56 cases (74.6 %). Other implants used were lateral plate/ nail Stabilisation (Fig 2. SER4) in 6 cases (8%), Tension band wiring in 8 cases (10.6%) and K-Wires in 5 cases (6.6%).

Group B patients were commonly treated by Closed Reduction by Quigley technique or by traction countertraction and reversing the forces that produced the injury as per L – H classification and long leg cast for six weeks in 53 cases (81.5%) and the rest were treated by splints, braces and traction.

COMPLICATIONS

Group A: Wound infection, superficial 2 and deep 1., malreduction 2, intraarticular penetration of implant 3 cases, margin superficial necrosis.

Group B: Superficial infection in 7 cases, skin sloughing 1 case, stiffness 9 cases, malunion 4 cases, loss of reduction 5cases, swelling 3 cases and secondary osteo arthritis in 2 cases.

Overall final functional results were assessed as per Olerud and Molander scoring (100 points) and Group A had good to excellent results in 68 cases (90.6%), good in 3 (4%), fair in 2 (2.6%) and poor in 2 (2.6%). And Group B achieved good to excellent results in 49 cases (75.3%), good in 4(6.1%), fair in 5 (7.6) and poor in 7(10.7%).

TABLE 4: Final Functional Results (Olerud And Molendar) Maximum 100 Points.

PARAMETER	DEGREE	POINTS
Pain	None	24
	Walking on uneven surface	20
	Walking on even surface outdoor	10
	Walking indoors severe constant	05
Stiffness	None	10
	Stiffness +	0
Swelling	None	10
	Only in evening	5
	Constant	0
Stair Climbing	No problem	10
	Impaired	5
	Impossible	0
Running	Possible	5
	Impossible	0
Jumping	Possible	5
	Impossible	0
Squatting	No problem	5
	Impossible	0
Supports	None	10
	Tapping/Wrapping	5
	Stick/Crutch	0
Work & A D L	Same as before injury	20
	Loss of tempo	15
	Change to simpler job	15
	Severly hampered work capacity	0

**Fig 1- Typical PER3 Injury Lateral column stabilisation & Restoration of Ankle mortise. Pre op. & Post opt pictures****Fig 2 - Typical SER 4 Injury Lateral column stabilisation & Restoration of Ankle mortise. Pre op. & Post opt pictures**

DISCUSSION

Ankle fractures are increasingly common injuries that necessitate careful approach for proper management. There is high load per unit surface area upto five times the body weight and therefore, the need for accurate reduction (Mehta, SS, Rees K, Cutler L *et al* 2014). There is lack of clarity regarding effectiveness of conservative or operative treatment in the literature (Larsen P, *et al* Foot Ankle Surg. 2018). The study was undertaken to study different variables in both modes of treatment in our set up.

A randomized, prospective study, included 140 patients, divided in two groups A and B was conducted in our hospital. Group A consisted of 75 (53.5%) surgically treated patients and Group B had conservatively treated 65 (46.4%) patients. The injury incidence was higher at two extremes of age, the mean age in Group A was 29.5 years and in Group B 48 years, Male: Female ratio was overall more in favour of males 80 (57.1%), and groupwise A had 53 (70.6%) males and 22 (29.4) females but in Group B, females were dominant in number 38 (58.5%) as compared to males 27 (41.5). Mode of trauma indicated a high percentage of patients sustained injury by MVA (60%) in Group A, whereas, Group B had high percentage of low energy trauma (61.5%) in Females, may be more outdoor activity of males (vehicle driving, sports) and more indoor life of females, explain these findings. The fractures were classified as per Lauge – Hansen and main highlight was Group A had high percentage of grade III and IV injuries, Inference was it may be directly related to the severity of trauma. Commonest surgical procedure adopted in Group A was ORIF 56 cases (74.6%) using 1-2 cancellous cannulated screws 4.0 mm for medial malleolus and 1/3rd tubular plate for fibula in 35 (46.6%) was the commonest implant followed by tricortical screw for syndesmosis, Tension Band wiring, K-Wires, lag screws and malleolar screws.

Group B:- Majority 52 (80%) was treated by closed reduction under short GA, spinal or local haematoma block and immobilised by well moulded above knee cast for unstable fractures (Grade iii & IV) and PTB for stable fractures (Grade I, II, & III), for six weeks. Post operative and post plaster physiotherapy was given by a trained physiotherapist, till the patient was trained enough to take care of his own. Patients were regularly followed up periodically for a mean follow up of 26 months. Final Functional results were evaluated as per Olerud and Molander score (Table 4). GROUP-A (Operative group), showed Good to Excellent Results in 68 (90.6%), Good 3 (6.1%), Fair 2 (2.6%) and Poor in 2 (2.6%). Out of two poor results, one patient who developed deep infection and non-union and required a re-surgery after a silent period of six weeks and the other poor result was in a patient who underwent flap necrosis and later had to undergo coverage by plastic surgeon. GROUP B – had seven poor results, out of which three patients had loss of reduction and were re-manipulated

and developed mal-union and did not agree for surgery, two patients had non-union, since it was not painful, did not undergo any treatment and another two patients had blisters, swelling and were bed ridden because of medical problems were not advised any intervention.

There is a rising trend amongst the doctors as well as patients to go for surgical option and many a studies have given enough evidence to prove the superiority of surgical treatment over conservative. Makwana NK *et al.* 2001 presented results of a series of 47 cases of fracture ankle, and compared conservative and operative treatment. They reported that in Conservative group:- Anatomical closed reduction was not reliable ($p = 0.03$), Loss of reduction was very common ($p = 0.001$) also reported that in Operative group, Final Functional Score was significantly better ($p = 0.03$) and range of motion was significantly better ($p = 0.044$). Similar results have been reported by other authors too, Ahmad H Z, Nazr MY *et al.* 2011, have reported excellent to good results in 93.8 % by operative management. The Ponzer *et al* study gave 76 to 83 percent success, which is less than our success rate of 90.6 percent in operative group.

CONCLUSION

We conclude that ankle injuries are common in young males and require a definitive treatment targeting predictable final outcome by achieving anatomical reduction, stable fixation and early mobilisation of all displaced ankle fractures. Conservative treatment should be reserved for selected patients with stable fractures Type I, II of Lauge - Hansen, minimally displaced fractures or fractures that can be reduced well, old and infirm patients with medical problems or with local soft tissue contraindications to surgery.

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