

Comparative Study Of Conservative And Surgical Treatment Of Ankle Fractures

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Abstracts: Background: Ankle fractures were known since the time of Hippocrates and the mode of treatment of fractures around ankle is changing since then. Best results are obtained by anatomical restoration of joint space either by closed reduction & immobilization in the cast or by open reduction & internal fixation.. A clear rationale does not exist for both types of treatment. Objective is to study the outcome of management of ankle fractures. Methodology: This prospective study of, 34 ankle fractures has been undertaken to evaluate the end results of non-operative and operative treatment. This series includes both open and closed, irrespective of age and sex at OPD S.M.S. Medical College & Hospital, Jaipur during Aug'97 to Aug'99. Results: The overall results were directly related to reduction achieved & its maintenance. In our series, good results were obtained in 78.5% of all patients treated non-operatively whereas in 85% patients treated by surgery had good outcome. Conclusion: There was no significant difference in the functional outcome of ankle fractures treated either surgically or by closed reduction and casting. However patients treated surgically recovered quicker and showed better radiological outcome. We conclude that early & accurate reduction and its maintenance is necessary to achieve good functional results irrespective of method of treatment. [Shrivastava R NJIRM 2015; 6(4):86-90]

Key Words: pot's fracture, ankle fractures, bimalleolar fractures.

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Introduction: The fractures at the ankle joint are not uncommon. Initially all the fractures of the distal end of the leg bones including ankle joint were named as POTT'S fracture after the name of Sir Percivall Pott¹ He himself sustained this injury which was an open injury of the lower end of the leg bones. In the past, treatment of an open injury of such fractures was amputation at the site of fracture. He instead of going for an amputation decided to treat conservatively and was surprised when the wound completely healed and fracture united. This then became standard treatment of these fractures.

With the advancement of science the mode of treatment of fractures around ankle has changed dramatically. Best results are obtained by an anatomical restoration of joint space either by closed reduction & immobilization in the cast or by open reduction & internal fixation. It has been thought worthwhile to review the cases of ankle fractures which were treated either by closed manipulation or by open reduction & internal fixation.

Burwell and Charnley² showed that anatomical reduction and satisfactory fixation led to a rapid return of function. Several studies have indicated that internal fixation of displaced fractures of the ankle gives better results than conservative

treatment. Last 30 years, there has been an increasing trend towards operative intervention. In the older patients, however, there is concern about poor fixation, poor bone quality and compromised wound healing, which has led some authors to conclude that operative fixation carries unacceptable risk of complications. Previous studies have been difficult to interpret since the surgeon often selects the method of treatment on an individual basis, though the Lauge-Hansen^{3,4} worked on this problem extensively, both on cadavers and on the patients. He studied their X-rays carefully using different types of forces on cadaveric foot & noting the reaction of forces etc. Thus result of this in-depth study leads to a rational classification of the ankle fractures & also the management.

Material and Methods: This study has been undertaken to evaluate the functional outcomes of non-operative and operative treatment of the ankle fractures.

This series include random cases of 34 ankle fractures, both open and closed, irrespective of age and sex. All of them had attended the out patient department and/or fracture clinic of the Department of Orthopaedics at S.M.S. Medical College & Hospital, Jaipur during the period from Aug '97 to Aug '99. Study was approved by

institutional ethics committee a written informed consent was obtained from each patient and study was conducted according to world medical association declaration of Helsinki. The relevant literature on this subject was reviewed. Wilson's classification⁵ was used to classify the ankle fracture. The main aim of the management adopted was to get good functional results by achieving perfect reduction and its maintenance. Keeping this in view all the closed fractures of the ankle irrespective of the type were primarily tried to reduce by closed methods under general anaesthesia except the undisplaced fractures. The fractures in which closed reduction was not acceptable or the reduction was not maintained were undertaken for open reduction and internal fixation. All the compound fractures were treated by open reduction and internal fixation after through debridement of the wound with 'K' wires or tension band wiring. Closed treatment was by the application of a moulded below-knee plaster cast with radiographs taken immediately to ensure that there was no loss of reduction. The limb was elevated for 48 hours after manipulation and casting after which protected weight-bearing was allowed for six weeks. The plaster cast was inspected weekly for the first three weeks and standard radiographs were obtained. At six weeks the cast was removed and full weight-bearing commenced under the supervision of a physiotherapist. Any loss of reduction during the first three weeks was considered to be a failure of conservative management and further treatment was carried out at the discretion of the supervising consultant. These patients were excluded from the conservatively-treated group and analysed separately. All patients were assessed clinically and radiographically. Swelling of the ankle was quantified by measuring the ankle girth. The range of plantar flexion and dorsiflexion was measured with the patient seated and the knee extended using a goniometer. Other factors assessed included varus/valgus instability, anteroposterior instability, walking distance and subjective patient satisfaction. The radiological outcome was judged by using standard antero-posterior and lateral View. ORIF was performed using standard AO implants and techniques according to the AO/ASIF manual. All patients received antibiotic prophylaxis. Full weight-bearing commenced under the supervision of a physiotherapist on

removal of the cast. The main aim of the management adopted was to get good functional results by achieving perfect reduction and its maintenance. The fractures in which closed reduction was not acceptable or the reduction was not maintained were undertaken for open reduction and internal fixation. All the compound fractures were treated by open reduction and internal fixation after through debridement of the wound.

Dupuytren⁶ reduced the ankle fractures by supinating, adducting and plantar flexing the foot and applied the splint and later on replaced it by plaster cast Lauge Hansen⁴ in his series of 228 ankle fractures advocated the method of closed reduction based on reversal of mechanism of injury for different types of the ankle fractures. Kristensen⁷ in his series of 232 ankle fractures treated by Lauge Hansen's method of reduction and observed better results than the method used previously in Denmark, that frequent changes of plaster holding and ankle fracture must be done Charnley² used to reduce the ankle fractures by three points pressure in the plaster cast. He insisted to consider three points in reducing the fracture as – 1 keeping the foot at right angle to the leg, 2 compress to mortise 3 keep the foot internally rotated during the reduction and application of the cast. Initially all the fractures were treated by closed reduction and immobilization or open reduction and internal fixation, which was later on preferred by many authors based on the facts that the good functional results depend upon accurate reduction and its maintenance which may be better achieved by operative methods Burwell & Charnley²; Brodie & Denham⁸, In spite of Eventov et al⁹ favoured conservative treatment in most of the fractures of the ankle. However, the treatment of the ankle fracture is still a matter of controversy.

Results: Out of 20 surgically treated ankle fractures, 178.5% shows good results 31.5% show fair & no poor result. When in conservatively treated fractures, 117.8.6% shows good & 3 fair and no poor result Table -1 Maximum number of open fractures treated with debridement & internal fixation with K wire or tension band wiring.

Table 1: Treatment result Based on Kristensen's criteria⁷

Method of treatment	Total cases	Good	Fair	Poor
		No. of cases / %		
Operative	20	17/ 85%	3 / 15%	0/ 0
Conservative	14	11 / 78%	3/ 21.4%	0/ 0

Table 2: Type Of Fractures

Type	Number of cases	Percentage
Abduction	17	50.0%
Pronation-external rotation	7	20.5%
Supination-external rotation	6	17.6%
Adduction	3	8.8%
Vertical compression	1	2.9%
Total	34	100%

Table 3: Internal Fixation

Method	No. of cases	Percentage
TBW	8	40%
Plate & Screw	5	25%
Screw	5	25%
Screw K.Wire	2	10%
Total	20	100.00

Table 4: Treatment And Type Of Fractures

Type of fractures	Stage	CONSERVATIVES	OPERATIVE
		No. of cases / %	
Abduction	I	4 / -	1
	II	2/ 42%	8 / 55%
	III	-	2
Sub- Total		6	11
Pronation	II	-	
Eversion	III	7%	1/ 30%
	IV	1	5
Sub- Total		1	6
Supination	II	4	-
Eversion	III	1/ 35%	-
	IV	0	-
Sub- Total		5	0
Adduction	I	1	-
	II	1/ 14.2%	2 / 10%
Sub- Total		2	2
Vertical compression		0	1 / 5%
Total		14	20

Discussion: The aim of this study is to determine the outcome of operatively and conservatively treated ankle fracture. Surgical treatment of typical

closed displaced ankle fractures does not improve outcome when compared with non-operative treatment on the contrarily surgery in such cases leads to increase in serious complications. We found no significant difference in patient outcome at two years between those treated by open reduction and internal fixation and those treated non-operatively. There was also no treatment effect on any of the secondary outcome measures at any time point, including subjective and objective measures, which reinforces our main result. There were no significant differences among both groups with regard to general health, quality of life, or ability to return to work. Walking speed and five different metrics of gait also showed no difference at two years after injury. Complication rates were much higher in the operatively treated group, with a 19% infection rate and an 11% requirement for secondary surgery to remove infected or painful screws and plates. These are serious and expensive complications, which can be avoided by choosing non-operative care.

In the present study the course of delay usually was due to delay in initiation of the treatment due to late arrival of the patients as most of them initially were treated by old traditional remedial methods by the bone settlers in the village or even in the city itself. Good outcomes were also seen in the study of Dietrich et al.¹¹, who found that functional treatment of stable fractures appeared to be superior to surgery. No significant differences in functional outcome between the two treatment regimens were reported in any of these studies and Makwana et al.¹¹. Bauer et al.¹² showed no difference at the long term between patients treated surgically or by closed reduction and casting, but the surgical group recovered quicker. Philips showed better radiological outcomes in operatively treated patients, but the clinical outcomes were the same in both groups. Makwana et al.¹¹ showed functional advantage for operatively treated patients. The above findings suggest that stable fracture should be treated conservatively. However, unstable fractures fare better with operative treatment. In the current study, operatively treated patient group, most ankle fractures were unstable. This data would suggest that if there is minimal displacement of the distal fibula conservative management is acceptable in stable ankle fractures. ORIF would be

indicated for unstable, displaced ankle fractures. This is in agreement that accurate reduction and fixation of ankle fractures led to a rapid return of function.

The acceptability of reduction was graded as good or poor. While Burwell & Charnley's² criteria of acceptability of reduction was based on anatomical alignment. In present series, closed treated group of total 34 cases, 11 cases 78.5% obtained good reduction and rest 3 21.4% achieved poor reduction. The functional end results assessed on the basis of Kristensen¹⁰ criteria were found directly related to the reduction achieved and its maintenance. In our series good 78.5% & fair 21.4% results were recorded in patients who were treated non-operatively and secured good reduction. Similar results Good – 85% and Fair – 15% were recorded in patients who were treated operatively and secured good reduction. Poor end results obtained in cases where poor reduction was achieved irrespective of method of treatment.

The complication we came across was non-union of medial malleolus 5.8%. Wherever, the non-union is at the junction of medial malleolus with tibial plafond produces ankle instability and pain, while on contrary if present below this junction did not affect the end results, non-union of lateral malleolus was rare. Stiffness of ankle joint was unusual problem of ankle fractures irrespective of methods of treatment 28.5% conservative and 15% operative. It was distinctly associated with poor reduction.

Conclusion: This study includes randomly selected 34 cases of ankle fractures treated at the Department of Orthopaedics, SMS Medical College & Hospital, Jaipur from Aug '97 to Aug '99. Wilson's classification⁵ was used to classify the ankle fracture.

Reduction achieved on closed manipulation was good in 78.5% cases, and poor in 21.4% cases. The functional end results were good in 78.5% & fair in 21.4% in reduced cases. The poor results were due to poor reduction of the fracture both in open and close treatment.

In present study most of the Stage I & II fractures good and fair results were slightly higher in cases

which were treated operatively 85%, then by conservative methods 78.1%.

We found that early and accurate reduction and its maintenance is necessary to achieve good functional results irrespective of the method of the treatment.

Results were graded on Kristensen's criteria⁷. It was found that it was directly related to reduction achieved & its maintenance. In our series good 78.5% and fair 21.4% results were recorded in patients who were treated non-operatively and secured good reduction. Very equally results Good 85% & Fair 15% were recorded in patients who were treated operatively.

We conclude that early & accurate reduction and its maintenance is necessary to achieve good functional results irrespective of method of treatment

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