Original Article

Outcome of Surgical management of ankle fractures: An experience of 38 cases in a tertiary care hospital.

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ABSTRACT

Objective: To determine the outcome of surgical management of ankle fractures in a tertiary care hospital.

Study Design: Prospective, observational study.

Place and Duration: Department of Orthopedics, Peoples University of Medical & Health Sciences Hospital Nawabshah, from January 2010 to December 2011.

Patients and Methods: The study was conducted on 38 cases including 29 (76.32%) male and 9 (23.68%) female, which were operated for close ankle fractures with AO principles. Fractures classified according to AO classification; Type A, Type B, Type C, the cases of the close ankle fractures were operated by open reduction and rigid internal fixation, with average follow up of 9 to 12 months. The implants used during surgery were, Malleolar screw, 1/3 tubular plates, 4 mm cancellous screws, 3.5 mm cortical screws, K. Wires and Tension band wire. Before surgery general condition of the patient was assessed. Once the patient was stable, attention was directed to ankle injury. Neurovascular status of the foot was assessed and if compromised, immediate reduction was performed. The injured extremity was placed in double U splint with ankle at 90 degree, high elevation and ice packs were applied to reduce oedema. If fracture blisters, marked haematoma or swelling was present, surgery was not performed and was postponed for a few days, with elevation and local cooling ensuring better soft tissue conditions. The stable patients were operated accordingly, and results were tabulated.

Results: All cases operated for close ankle fractures with AO principles, In type A fracture 10 were male and 4 were female, in type B fracture 13 were male and 3 were female and in type C 6 were male and 2 were female with average male female ratio of 3:1. Majority 48% patients suffered due to road traffic accident, 10% during fall from height, and 21% during slip on ground or steps and 21% during sports injuries. The assessment was done for one year. 33 patients walked independently at 12-14 weeks. 5 patients had delayed weight bearing because of infection, loose metal, delayed union radiologically. Complete healing with union occur in 33 cases and malunion in 05 cases, no any case of nonunion was seen.

Conclusion: In current study the results matched AO experience, Complete healing with union occur in 33 cases and malunion in 05 cases, no any case of nonunion was seen. Better results can be achieved if the operative technique is more precise and after treatment more dynamic.

Key Words: Ankle Fractures, Surgical Management, Tertiary Care Hospital.

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INTRODUCTION

The pattern of injury to the ankle depends on many factors, including; the age of the patient, the quality of the bone, the position of the foot at the time of injury and the direction, magnitude, and rate of the loading force. Lauge Hansen[1] reported that the position of the foot (Pronation or Supination) at the time of injury is described first and the direction of the deforming force is described second. The common deforming forces

acting on the ankle are abduction, external rotation and vertical loading. Pronation and supination refer to the position of the foot as it rotates around the axis of the subtalar joint[2] Adduction and abduction are deforming forces resulting in the rotation of the talus around its long axis, while internal and external rotations are rotational movements around the vertical axis of the tibia. The mechanisms of injury are decribed using this terminology[2].

Early surgical treatment of displaced fractures was advocated by Lane[3] during the early part of this century because of the significant incidence of permanent deformity and disability with non-surgical treatment alone[4]

It has Been documented that athletes with unstable ankle injuries treated with rigid and anatomic internal fixation with concomitant repair of indicated ligaments followed by an accelerated rehabilitation program consisting of early weight bearing and near-immediate range of motion (ROM) can obtain excellent outcomes. Early ROM and weight bearing, if indicated depending on the specific injury pattern, can be effective with low morbidity[5].

The AO group began a systematic study of fracture treatment. They expanded the principles of lane, Lambotte and Danis and developed new implants and techniques of fixation that form the basis of current operative management of ankle fractures. In 1970s a number of anatomical, biomechanical and clinical studies combined to show the importance of exact restoration of the ankle joint, including both the medial the lateral malleolus. Fractures of the ankle are one of the most commonly treated injuries by orthopaedic surgeons[6] Ankle fractures are common injuries, particularly the injuries that require operative intervention[7]. Recent studies have shown that propensity for falls, increased weight, and polypharmacy may play a larger role than osteoprosis does in the occurrence of ankle fractures[8].

The goals of operative treatment are to obtain an anatomical reduction that is maintained by stable fixation, resulting in a healed fracture and recovery of normal function. The present study was conducted to see the outcome of surgical management of ankle fractures in a tertiary care hospital.

MATERIAL & METHODS:

The current study was conducted in the department of Orthopedics, Peoples University of Medical & Health Sciences Hospital Nawabshah, from January 2010 to December 2011. The study was conducted on 38 cases including 29 (76.32%) male and 9 (23.68%) female, which were operated for closed ankle fractures with AO principles. Fractures classified according to AO classification; Type A, Type B, Type C (Table 1). During the study period forty-eight cases of the closed ankle fractures were operated by open reduction and rigid internal fixation. The assessment performed on thirty-eight patients with average follow up of 9 to 12 months. The inclusion criteria are, patients aged 20 years and above, having close ankle fractures. The exclusion criteria was, compound fractures, vascular injury, patent epiphysis, head injury, chest injury, abdominal trauma, pilon fracture & pathological fractures. The implants used during surgery were, Malleolar screw, 1/3 tubular plates, 4 mm cancellous screws, 3.5 mm cortical screws, K. Wires and Tension band wire. Before surgery general condition of the patient was assessed and vital functions airway, breathing, and circulation were evaluated. Once the patient was stable, attention was directed to ankle injury. Neurovascular status of the foot was assessed and if compromised, immediate reduction was performed. The injured extremity was placed in double U splint with ankle at 90 degree, high elevation and ice packs were applied to reduce oedema. If fracture blisters, marked haematoma or swelling was present, surgery was not performed and was postponed for a few days, with elevation and local cooling ensuring better soft tissue conditions. The stable patients were operated accordingly, and results were tabulated.

RESULTS:

In current study 38 cases were operated for close ankle fractures with AO principles, In type A fracture 10 were male and 4 were female, in type B fracture 13 were male and 3 were female and in type C, 6 were male and 2 were female with average male female ratio of 3:1. Majority 48% patients suffered

due to road traffic accident, 10% during fall from height, and 21% during slip on ground or steps and 21% during sports injuries (Table 2).

All of 38 patients were assessed for one year. 33 patients walked independently at 12-14 weeks. 5 patients had delayed weight bearing because of infection, loose metal, delayed union radiologically. The results were assessed for:

1. Post-operated pain, majority 89.47% of patients had no pain (Table-3)

2. Movements at the fractured ankle, excellent results achieved in 76.03% of the cases; some restriction of the ankle motion was seen in 23.67% (Table-4).

Complete healing with union occur in 33 cases and malunion in 05 cases, no any case of nonunion was seen (Table 5).

DISCUSSION:

Treatment of ankle fractures is often based on fracture type and surgeon's individual judgment[9]. In current study the results matched AO experience, overall good results of 90% for type A: fracture and 70-80 percent for type B and C, which were comprable with other studies[10-13]. Most patients were able to return to full activity after three months. Many orthopaedic surgeons advocate conservative management of ankle fractures by short leg pop cast and claim good results, but our study basically covers the surgical aspects; it is not comparable study with conservative management.

This study illustrates the principles of management of intra articular fractures, exact anatomical reduction and stable internal fixation to allow early movement of the joint. Hoiness, etal[14] had pointed out the influence of timing of surgery on soft tissue complications and hospital stay. He had reviewed 84 closed ankle fractures and concluded that delayed surgery of closed ankle fractures increases the risk of soft tissue complications and prolongs the hospital stay. Immediate surgery is particularly indicated in the severally displaced ankle fracture, and if not achieveable, temporary reduction and immoblization is recommended. James et al,[15] had also emphasized timing of operative intervention in the management of acutely fractured ankles and the cost implications. 4.4% fractures were operated with in first week (Table-6). The reasons of delay were marked oedema, poor skin condition like fracture blisters, concomitant systemic conditions like uncontrolled diabetes mellitus and increased blood pressure and economical constrains. In his study the mean patient stay in hospital was 9.6 days in this early operated group. The patients who had their operation delayed were in hospital for a mean of 14 days (Table-7), a significant difference ($P<0.0001$) (using wilcoxon's signed rank test).

CONCLUSION:

The best results of treatment of ankle fractures are achieved by open reduction and rigid fixation. Absolute anatomical reduction is essential to prevent post traumatic arthrosis. The fixation must be rigid enough to allow early exercise so as to prevent stiffness in the ankle and subtalar joints. This requires considerable skill in the operative treatment of fractures. Better results can be achieved if the operative technique is more precise and after treatment more dynamic.

TABLE-01
Types of Ankle Fractures

Type	No. of Cases	Percent
A	14	36.83%
B	16	42.10%
C	08	21.07%
Total	38	100%

TABLE-02
Mode of Injury band Distribution of Cases

Type of Injury	No. of Cases	Percent
Road traffic Accident	18	48%
Fall from height	04	10%
Slip on ground or steps	08	21%
Sports injury	08	21%
Total	38	100%

TABLE-03
Post Operative Pain Score at One Year

Type	No. of Cases	No. Pain	Pain on Exercise	Pain at Res:
A	14	13	0	1
B	16	14	1	0
C	8	07	1	1
Total	38	34	2	2
Percent	100%	89.47%	5.26%	5.26%

TABLE-04
Status of Movements

Type	No. of Cases	Normal	Restriction of $< 20^{\circ}$	Restriction of $> 20^{\circ}$
A	14	13	01	0
B	16	11	04	2
C	8	05	01	1
Total	38	29	06	03
Percent	100%	76.03%	15.78%	7.89%

TABLE-05
Out Come of All 38 Cases

Type	No. of Cases	Union	Malunion	Nonunion
A	14	13	0	0
B	16	14	02	0
C	8	06	03	0
Total	38	33	05	0

TABLE-06
Time of Operation for Ankle Fractures

Time of Operation	No. of Cases	Percent
Within 24-48 hours	4	10.5%
Within 1st Week	16	47.4%
Within 2nd Week	18	42.1%
Total	38	100.00%

TABLE-07
Hospital Stay

Operated Period	No. of Cases	Average Stay
Operated within one week	20	5 - 10 days
Operated within 2nd week	18	10-20 days

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