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RESEARCH ARTICLE

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Operative Outcome of Ankle Fractures : Audit from Regional Referral Hospital, Oman

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Introduction

Ankle fractures are the second most trauma presentation of the lower limb with incidence of 187 /100000 [1, 2]. Ankle fractures carry significant morbidity of not treated appropriately [3]. Management of these fractures depends on the stability of injury. Stable fractures can be managed conservatively by splinting but majority of these fractures are unstable and need open reduction and internal fixation.

The objective of this study was to analyze the common causes, pattern and types of such fractures seen in our setting and assess the functional outcome of operated ankle fractures during the study period and identify areas for improvement in our management of ankle fractures.

Methodology

Retrospective study analysis of forty patients with ankle fractures operated in Nizwa hospital from 01/01/2014 to 31/12/2016 was done to study the causes, pattern and functional outcome of open reduction and internal fixation of these ankle fractures. Data was compiled using combination of electronic hospital case note review, radiographic review and clinical assessment. Data analysis included age, length of hospital stay, pattern of fractures, type of fixation, complications and outcome.

Inclusion criteria:

1.Unstable closed or type 1 open ankle fractures ,

2.Patients 15years and above age,

3.Complete follow up for 06 months

Exclusion criteria :

1. Ankle fractures treated conservatively,

2. Patients below 15 years age .

3. Operated Ankle fracture patients with incomplete follow up,

4. Pathological fractures, pilon fractures, Type II / III open fractures, Charcots joints,

Patients on admission were worked up after clinical and radiological assessment which included AP, lateral and mortise views. Surgery was performed by orthopedic surgeon of specialist/Consultant grade under general or spinal anesthesia as deemed fit by anaesthetist. All patients underwent open reduction and internal fixation in form of Recon or semitubular plating of fractured fibula and malleolar screw fixation / Tension band wiring for medial malleolus fracture.Operating surgeon ecided about the type of implants. Intra operatively decision about syndesmotic screw was decided using hook test for all patients . .Post operatively all fixations were protected initially in below knee plaster slab for 02 weeks followed by below knee cast for another 04 weeks after suture removal. Patients were mobilized with non weight bearing crutches for period of 06 weeks. Syndesmotic screws were removed after 06 weeks and then patients were allowed partial weight bearing progressing to full weight bearing with ankle mobilization exercises as tolerated by them. Functional outcome was done at 06 months using Olerud and Molander ankle scoring system(OMAS).

The data retrieved was charted on MS excl sheet 2010 and analysed using SPSS 20 with statistical significance taken as 5 .

Informed consent from the patient was not required as it was retrospective study with already stored pa data in hospital computer system with no direct patient contact required. However approval was obtained from hospital ethical committee for carrying this Audit.

Results

Total of 48 cases of operated ankle fractures were retrieved from our electronic database during the period from 01/01/2014 to 31/12/2016. Forty patients who fulfilled the inclusion criteria were analysed.Nizwa hospital is a secondary referral centre for Al Dakhliya and Wusta regions of Sultanate of Oman .There were 32 male (80%) and 8 female(20%) patients within age range from 15-60 years (mean 28.4 years) (Table 1).

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Age in years	Number of Patients	Percentage %	Male	Percentage %	Female	Percentage %
15-25	8	20	7	17.5	1	2.5
26--35	12	30	10	25	2	5
35-45	8	20	7	17.5	1	2.5
46-50	8	20	6	15	2	5
51 -60	4	10	2	5	2	5
Total	40	100	32	80	8	20

Causes: Motor vehicle accidents (MVA) accounted for 45 % of the all cases followed by Twisting injuries / slips in 22%. In younger population active sports related injuries mainly football trauma accounted for 20 % cases. Other cases due to falls especially in elderly accounted for 8% (Table 2).

Table 2: Different Causes of Ankle Injury and Incidence

Causes of Injury	Number of Patients	Percentage %
MVA	18	45
Sports	8	20
Slipping/ Twisting	9	22.5
Others/ Falls	5	12.5

Pattern and site of ankle fractures

There were 37 closed fractures (32.5%) and 03 (7.5%) type 1 open fractures of ankle. Fractures on left side were seen in 22 (55%) cases compared to right side in 18(45%) cases (Table 3).

Table 3: Shows the side of ankle involvement

Side	Number of Patients	Percentage %
Right	18	45
Left	22	55

Type B fractures as per Dennis Weber classification was most common seen in 22(55%) cases followed by Type C 18(30%) and Type A 6(15%)fracture patterns.Based on Lauge-Hansen Classification Supination External Rotation (30%) followed by Pronation External Rotation(25%) and supination adduction(20%) was most common mechanism of ankle injury.(Table 4, 5).

Table 4: Radiological Types of Fractures as per Weber Classification

Type of Fractures	Number of Patients	Percentage %
Type A	6	15
Type B	22	55
Type C	12	30

Table 5: Incidence of Fractures depending on mechanism of injury(Lauge- Hansen Classification)

Type	Number of Patients	Percentage %
Supination Adduction	8	20
Supination External Rotation	12	30
Pronation Abduction	6	15
Pronation External Rotation	10	25
Pronation Dorsiflexion	4	10

Types of Fixation

The 3.5 mm Recon plate was commonly used for fixation of fibular fractures in 37(92.5%) cases and one third tubular plate in 3(7.5%) cases.Malleolar screws was used in 35(87.5%) and tension band fixation in 05 (12.5%) cases of Fractures medial malleolus.No implants were used for fixation of posterior malleolus fractures in our study.

Follow up ranged from 05 weeks to 20 weeks(mean 7.6 weeks). Postoperatively patient was hospitalized for less than 05 days (2.3 days). Four patients stay was extended due to financial problems and delay in clearing of bills or due to other associated injuries

Complications: Superficial infection was found in 5 (12.5%) cases which resolved with antibiotics and regular dressings.No case of deep infection was found .Joint stiffness was seen in 7(17.55) cases.

Outcome

92.5% (37 patients)had excellent and good outcome 5%(02 patients) had fair results and 2.5%(01 patients) had poor outcome using Olerud and Molander ankle scoring system.Patient with poor outcome was result of superficial infection associated edema/ stiffness and pain on weight bearing.

Discussion

Over the years surgical management of unstable ankle fractures has shown improved results due to better understanding of ankle biomechanics and improved fixation techniques .The aim of our study was to evaluate the results of unstable ankle fractures managed by surgical fixation in our hospital.

The goal of treatment is to achieve anatomical restoration of ankle joint along with early union and painless range of motion of ankle joint .Closed treatment methods are not able to restore anatomy and biomechanics of unstable ankle fractures [4]. Surgical fixation of ankle fractures is not without risks but early surgical stabilization has proven to be associated with fewer complications and fast rehabilitation as shown in other studies also [5, 6, 7, 8].

In our study although the number of patients sample size was small (40) but our data proved that early surgical fixation lead to shorter hospital stay of 2.3 days average in our study with reduced risk of postoperative infections and improved patient satisfaction and outcome . Singh et al [8]also reported that operative fixation of ankle fractures beyond 24 hrs from injury time is associated with danger of postoperative complications and subsequent increased stay in hospital .Delayed surgery secondary to delayed presentation of 05 to 08 days results in slower bone healing at 06 weeks and prolonged immobilization and non weight bearing. However soft tissue swelling is no contraindication for early surgery (6-12 hrs) after injury .There is less danger of disturbing

the microcirculation in wound margins due to edema during surgery if done meticulously with delicate soft tissue handling .

The age range of patients in our study was from 15-60 years(mean 28.4 years) which is comparable to other studies(3,5).Motor vehicle accidents was the major cause of ankle fractures in our study followed by twisting injury and fall, slips which is similar to other studies [4, 5, 7, 9].

In our study the infection rate and other complications are comparable to other studies [4,5,7,8].The risk of Veno thrombo embolism (VTE) following ankle , foot surgery is reported less than 01% [3] but the risk of postoperative DVT remains high in high risk patients who are obese , prolonged immobilization and those on oral contraceptives . In these group of cases patients were discharged on low molecular weight heparin for a period of 03 weeks in our patients. Early weight bearing from day one post ankle fixation with better functional outcome by some authors (10), but in our hospital and type of patient we have our advise is non weight bearing for period of 06-08 weeks with initial follow up at 02 weeks and later at 06 weeks to assess the progress and subsequent partial progressing to full weight bearing with active range of ankle movements from first post operative day.

The final outcome was excellent and good in 92.5% (37 patients) which is similar to other studies [4, 5, 8, 9, 10].

Our study had its own limitations:

-First it was a retrospective study with small sample size.

-Many variables were obtained from patients file through Hospital computerised data , thereby limiting the number, quality, and completeness of variables that can be obtained .

-Complete information on the patients postoperative rehabilitation was not available.

-We did not perform a comparative study with modalities of treatment.

Conclusions

Early aggressive treatment of ankle fractures in form of open reduction and internal fixation preferably within 24 hours is key for success as it helps reconstruction of articular surface and tibiofibular syndesmosis with early rehabilitation leading to high percentage of good functional results.

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