



TO STUDY OUT COME OF TRIMALLEOLAR FRACTURE TREATED SCORING WITH OPERATIVE TECHNIQUE

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ABSTRACT

In ankle trimalleolar fractures are most complex. The joint stability is important for locomotion and transmission of body weight and so ankle injuries are important. Trimalleolar fractures requires a reduction and stable internal fixation. Assessment of functional outcome and results of surgical treatment of trimalleolar fractures was the motive of this study done by particular techniques, proper anatomical alignment and syndesmotomic screw application if needed. A Prospective study was conducted for 18 patients with trimalleolar fracture. Open reduction and internal fixation was done with specific modalities. Patients were evaluated with functional scoring by Baird and Jackson. The functional outcome of ORIF and advantages of the procedures were recorded. In this study of 18 patients with ankle fractures were treated by open reduction and internal fixation. Excellent results were achieved in 12 (75%) patients, good in 4 (35%), fair in 1 (5%) and poor in 1 (5%) patient. Results were excellent in all isolated lateral malleolar and bimalleolar fractures. Two (14%) patient who were trimalleolar fracture had poor to fair outcome. The patient with poor outcome had pain with day to day activities, reduced ankle movements and joint space reduction. Fracture classification done under Lauge-Hansen which is based on mechanism of injury and treatment planned accordingly. After anatomic reduction and stable fixation through the specific operative methods, the short-term outcome was good and complications were reduced to minimum.

Key words: Trimalleolar Fracture, 1/3rd Tubular Plating, Medial Malleolar Screw.

INTRODUCTION

Robert Jones said “Ankle is the most injured joint of the body but the least well treated. Trimalleolar fractures demand reduction and stable internal fixation .fractures around ankle are most common in lower limb and around 9% of all fractures representing the important part of trauma workload. [1] Ankle fractures affect mostly young men and older women, however, below the age of 50 ; commoner in men. Denis Weber AO classification and the Lauge-Hansen are the commonly used classifications. The treatment goal is to make a proper anatomical reduction of the talus and fibular length correction. This is done as a lateral shift of talus around 1mm occurs in ankle mortise thereby the contact area decreased by 42% and shortening /

displacement more than 2mm that leads to increase in joint contact pressure. Further studies are required to take a stand for better or select the fixation method. Usually stable fractures are treated by conservative methods and proven to give better outcome. On the other hand , unstable fractures (displaced) need operative fixation i.e., open reduction and internal fixation. [2] Assessment of functional outcome and results of surgical treatment of trimalleolar fractures was the motive of this study done by particular techniques (medial malleolar screw, lateral malleoli plating , posterior malleoli screw fixation) , proper anatomical alignment and syndesmotomic screw application if needed.

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MATERIAL AND METHODS

18 Patients with fresh trimalleolar fractures who attended Sree Balaji Medical College and Hospital, Chrompet, Chennai, from August 2015 to March 2017 were included in study. Patients were evaluated in casualty; xrays were taken i.e., anteroposterior, lateral view. Patients were admitted and history was taken in detail regarding mechanism of injury, any comorbidities, personal details. [3] General condition of the patients were assessed and clinical examination was done. Patients were excluded who had active infection at site of injury from the study. During post-op, patients were assessed at 6,12 weeks and 6 months based on Baird and Jacksons functional scoring.

Inclusive criteria:

1. Age more than 20 years and less than 60 years of age.
2. Closed fractures of both male and female.
3. All fracture patterns of duration not more than a week.

Exclusive criteria:

1. Open fracture and medical co morbidities.
2. Old operated fractures and neglected fractures.
3. Patients not fit for surgery.

OPERATIVE METHODS:

Various techniques are involved in fixation of ankle fractures, but the goal is to make a proper anatomical reduction of the talus and fibular length correction. [4] This is done as a lateral shift of talus around 1mm occurs in ankle mortise thereby the contact area decreased by 42% and shortening / displacement more than 2mm that leads to increase in joint contact pressure. Fixation of medial or lateral malleoli to be done first is the surgeon's choice. Since these fractures are mostly unstable, it will be improved once medial malleoli is fixed initially.

1. In this study, we have the successive series:

1. The medial malleoli is fixed
2. The fibular shaft is brought out to length and fixed
3. The Volkmann's fragment (posterior malleolus) is reduced and fixed
4. The integrity of the syndesmosis is restored

Medial malleolus was fixed using malleolar screw which is bio mechanically a strong construct using a small medial incision. [5] Lateral malleolus was fixed with a 1/3rd tubular plate placed onto the lateral surface of the fibula and bent and twisted. [6]

Once fibula fixed for syndesmotic stability After Fibula has been fixed and look for syndesmotic stability. To separate fibula and tibia maneuvers are performed and fixed with a 4.5mm tricortical screw inserted 2cm above and parallel to ankle joint. It is inserted from fibula to tibia. Fixation of posterior malleoli was required if more than 25% articular surface involvement and that can be fixed with 4 mm cancellous screw. It is fixed percutaneously through anteroposterior or posteroanterior by stab incision.

RESULTS:

In this study, 18 patients with ankle fractures were treated by open reduction and internal fixation. Excellent results were achieved in 12 (75%) patients, good in 4 (35%), fair in 1 (5%) and poor in 1 (5%) patient. Excellent results were achieved in 12 (75%) patients, good in 4 (35%), fair in 1 (5%) and poor in 1 (5%) patient. [7] Results were excellent in all isolated lateral malleolar and bimalleolar fractures. Two (14%) patient who were trimalleolar fracture had poor to fair outcome. The patient with poor outcome had pain with day to day activities, reduced ankle movements and joint space reduction.

Figure 1: Preoperative (a), intraoperative (b) and post-operative (c) pictures of one of the case in our series



Figure 2: Patient showing good Plantar flexion (a), dorsiflexion (b) and is able to squat well (c) at final follow up



DISCUSSION

Because of the detailed anatomy and post traumatic anatomy as well as function of ankle joint lead to reduction and fixation technique of trimalleolar fractures. Prompt operative treatment of displaced ankle fractures decreases morbidity and improves functional outcome.[8]

Trimalleolar fractures treated by open reduction and internal fixation by AO principles were having excellent outcome and study shows the results. According to Baird and Jackson scoring shows that nearly 75% in this study showed excellent outcome and 35% achieved good outcome. They had anatomical reduction of both malleoli and talus. [9] Posterior malleoli fixed percutaneously decreases the chances of skin necrosis ; also reduces soft tissue trauma and vessel damage which shows decreased AVN of talus as a complication that presents late. [10]

In this study fixation of diastasis following the posterior malleoli fixation provides better stability for the ankle joint biomechanically. Stress tests were performed intra-operatively for checking the stability of medial and lateral stability under the guidance of C-arm following the diastasis fixation. Congruency of talus with both malleoli viewed under C-arm which shares the weight bearing portion of ankle joint ,intra-operatively. Fibular plating provides lateral stability in addition to maintain length of

fibula. Congruency of medial part of fibula to talus should also be maintained. [11]

Non- union complication of medial malleoli were decreased with precaution to periosteal interposition during fixation procedure. It is also In our study it was seen that better biomechanical stability of ankle was also related to fixation of diastasis only after fixation of posterior malleolus. After fixation of diastasis Per operative medial and lateral stability were checked under C-arm with the help of lateral and medial stress tests. [12] Per operative checking of congruency of talus with both malleolus by C-arm produces the maximum contact weight bearing surface of ankle joint. While walking it is useful in providing excellent gait biomechanic in the long run. Anatomical fixation of fibula by moulded plate not only maintains fibula length but is also paramount for lateral stability. It is also important for maintaining congruency of medial part of fibula to talus. Ankle diastasis is fixed in neutral position the anatomical relation of malleoli with talus is maintained; if in dorsiflexion congruency would have been disturbed.

CONCLUSION

Trimalleolar fractures treatment based on Baird and Jackson scoring with operative technique open reduction and internal fixation using AO principles concluded both excellent and good results.

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