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Posterior malleolus fixation in trimalleolar fracture with ankle dislocation

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Abstract
Ankle fractures are common fractures. Some epidemiological studies suggest that these injuries are increasing in annual incidence over time (1, 2). Posterior malleolus fracture can occur concurrently with lateral malleolar and medial malleolar fractures or in separation. There are many controversies in the indications of posterior malleolus fixation. Most orthopedic surgeons suggest that large fragments should be fixed (3). A number of different surgical approaches and techniques for internal fixation of posterior malleolar fractures have been reported. In case of malreduction, post-traumatic arthritis of the ankle is common, which may affect their quality of life. Treatment of posterior malleolus fracture is controversial.

Keywords: Ankle, Trimalleolar, Ankle fracture, Posterior malleolus fracture, K wire, Percutaneous

1. Introduction
Ankle fracture is an injury to bones of the ankle joint, with an annual cases of 174 out of every 100,000 population [4]. About 10% of these patients may develop post-traumatic arthritis, limited ankle movements, and severe ankle pain after appropriate or inappropriate treatment [5, 6].

2. Indications: The indications for fixation of the posterior malleolus remain controversial. The current indications are varied and evolving. These include fractures involving
1. >25% to 33% of the articular surface tibia,
2. Displacement >2 mm,
3. Ankle instability with concomitant syndesmotic injury,
4. Persistent posterior subluxation of the talus [7, 8].

3. Material Method
Our patient's age is 40yrs, male. He had twisting injury to right ankle joint when he fall from motorcycle. He was brought to this hospital immediately; he was having deformity at right ankle joint but no abrasion or wound. After giving routine medicine and BK slab, fitness was obtained. On fourth day, when swelling largely subsided and creases on the ankle joint patient was taken for operation. Under spinal anesthesia, panting draping is done.

4. Operative Procedure
Fibula is fixed first so that ankle joint is fixed. Lateral incision on lower end of fibula is taken. Fracture is reduced DCP plate and screws fixed under C-arm guidance. Medial malleolus reduced and fixed by closed technique by cancellous cannulated screw. Additional fixation of medial malleolus achieved by K-wire. For fixation of posterior malleolus, which was 3 cm of the lower tibial articular surface, two screws fixation was planned posterolateral side of tendoachilis stab incision was taken dissected up to the bone by artery forceps, guide wire is passed into the posterior malleolus fragment as a joystick. Fragment was manipulated, reduction achieved. Two guide wires are passed through the fragment and into lower end of tibia.
Measured length of cancellous cannulated screw were inserted under C-arm guidance. BK slab was applied and protocol medicines were given. After removal of stitches, he was given BK cast and discharged. After six weeks patient reviewed after removal of cast. Everything was ok, so he was allowed physiotherapy of ankle joint with non-weight bearing. At 10 weeks he was advised toe-touch weight bearing. At 12 weeks he was advised total weight bearing with physiotherapy. At this time his all ankle movements and weight bearing were painless.
It is best to operate within 8 days when creases appears at the ankle joint [7, 8]. Posterior malleolus fragment is fixed with percutaneous posterior to anterior 2 screws.

5. X-Ray Report
There is medial malleolus fracture. Lateral malleolus suprasyndesmotic fibular fracture and more than 20 mm post malleolus fragment with intact tibio-fibular syndesmosis, posterior dislocation of talus.

6. Discussion
Studies have shown that a permanent step-off in the tibiotalar joint is the most important part in the development of osteoarthritis. So functional outcome is less satisfactory. The disadvantages of percutaneous reduction followed by percutaneous screw fixation of the posterior fragment in an anterior-to-posterior or posterior to anterior direction is difficult due to soft tissue interposition or loose bony fragment. Fixation of small or comminuted fragment is difficult. Open reduction and internal fixation by posterolateral approach is good in such cases. But if there is no communition then percutaneous reduction by joystick- k wire and percutaneous cancellous cannulated screw

gives best result and wound care is better than posterolateral approach.

But we have done in this case, percutaneous reduction followed by percutaneous fixation. Reason is less soft tissue dissection, so early healing.

If closed reduction fails then we do open reduction. Fracture of posterior malleolus usually occurs with in conjunction and medial malleolar fracture [7, 8].

The purpose of the study to discuss the current status of operative treatment of posterior malleolus, though it is controversial. 50% of the operatively treated ankle fractures have posterior malleolar fragment.

7. Indications: Of posterior malleolus fixation are-

1. Fracture involving >25% - 33% of articular surface of tibia.
2. Displacement >2 mm.
3. Ankle instability.
4. Persistent posterior subluxation of the talus.

Now it is believed that, even small posterior malleolar fragments are important to ankle stability surgical indications are expanded [7, 8].

Up to this time this injury is under estimated.

At one year we find that patient having incongruity have started rheumatic osteoarthritis [8].

8. Complecations: No complications what so ever.

9. Result

This is a case report. So single patient. At 12 weeks follow up, patient was having 90 % movements of ankle joint without pain. Patient was advised weight bearing. After2 weeks of physiotherapy patient was having 100% movements of ankle joint. So our result is 100%.

10. Conclusion

Posterior malleolar fracture of ankle is associated with significant morbidity. The factor includes the fragment size and displacement is the most important surgical indication. Our technique of closed reduction and percutaneous fixation by two cancellous cannulated screws has given good result. Though few cases may require open reduction and internal fixation.

Early operation is done when wrinkles appear on ankle joint- 5 to 7 days.

At 12 weeks we started weight bearing without pain.

So conclusion is that with this technique, most of the patient will have best result at the end of 12 weeks.

From this case we have learnt early operation is useful.

Fig 1: Pre-Operative Xray

Fig 2: Post-Operative Xray

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Conflict of interest: No interest of anybody in this study.
Ethical committee permission has been obtained.

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