

Triplane fracture, complex Salter Harris Type iv fracture in multiple planes

¹Tan HK; ¹Haris MI; ¹Singh H; ¹Han CS;

¹Orthopaedic Department, Hospital Sultan Haji Ahmad Shah, Temerloh, Malaysia

INTRODUCTION:

Fracture involving distal tibia growth plate is a challenging fracture pattern in multiple planes of juvenile group. Medial tibial physis fused approximately 18 months before lateral part. A combination of mechanism of injury and asymmetrical closure of distal tibial physis can produce triplane fracture. We report a case of triplane fracture treated with closed reduction and internal fixation.

CASE REPORT

A 13 year-old girl presented with closed triplane fracture distal left tibia, following a fall with ankle in supination and external rotation. She had diffuse ankle swelling with bruise formation, painful upon range of motion of ankle, however compartment was soft and distal pulse was good in volume. Initial ankle x ray showed Salter Harris IV over posterior metaphysis and epiphysis on lateral view, Salter Harris III over lateral epiphysis on AP view (Figure 1). Diagnosis was further confirmed with computed tomography of ankle (Figure 2). Fracture configuration able to be demonstrated in coronal, axial and sagittal views. We proceeded with closed reduction and screw fixation distal tibia.

Figure 1. Left ankle xray



Figure 2. CT left ankle



Intraoperatively, patient was placed in supine. Epiphysis was first addressed with cannulated screw size 4.0mm, inserted parallel to physis, with ankle placed in internal rotation. Metaphyseal fragment reduced with 2 cannulated screws inserted anterior-posteriorly, in perpendicular over fracture site. Ideally, screws supposed to be

inserted from posterior to anteriorly. All screws were avoiding physis to prevent growth plate premature closure.

Post operatively, bootslab was applied with ankle joint in plantigrade position, and avoid weight bearing for 4 weeks. A stepwise increase of plantar flexion and weight bearing after 6 weeks. Patient achieved union of fracture at 10 weeks postoperatively, and full range of motion and pain free ankle after 3 months.

Figure 3. Left ankle x ray post operatively



DISCUSSIONS:

Lateral triplane fracture is the commonest type, due to asymmetrical closure of physis, from central, towards anteromedial and lastly posterolaterally. It can be confusing with plain radiograph as more than 2 planes of fracture are involved. Hence a more detailed computed tomography is needed. Furthermore CT scan allows proper pre op planning to ease closed reduction and shorten duration of surgery.

CONCLUSION:

Triplane fracture is not uncommon among juvenile group of patients. A proper pre op planning with good understanding of fracture pattern will enhance the process and outcome of fixation, to achieve anatomical reduction of fracture by minimally invasive method and avoid damage to physis.

REFERENCES:

M. D. Lynn, "The triplane distal tibial epiphyseal fracture.," *Clinical Orthopaedics and Related Research*, vol. 86, pp. 187–190, 1972