

## Case Report

# Unusual case of talus neck fracture in a paediatric patient

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## ABSTRACT

Talus fracture is a rare injury in a paediatric patient. Among talus fractures, the fracture of neck of talus is more common than fracture of body of talus. This can occur because of axial loading of the talus in a dorsiflexed foot against the anterior tibia. Children's bones are skeletally immature and hence less brittle. They have higher elastic resistance than adult bone and are less likely to fracture. However talus fractures can still occur in paediatric patients when there is history of high-energy trauma. It needs surgery and can be associated with complications like avascular necrosis, delayed union, neuropraxia and may need a revision surgery. Here we present an unusual case of a talar neck fracture in a young boy, which was a closed fracture without distal neurovascular deficit. Closed reduction and internal fixation was done with K wire and post op X-rays and follow up X-rays showed complete union. Patient has normal joint mobility and strength after a period of 1 year follow up.

**Keywords:** Paediatric talus neck fracture, Avascular necrosis, Closed reduction, Internal fixation

## INTRODUCTION

Fractures of the talus are rare injuries with an estimated prevalence of 0.008% of all childhood fractures compared with 0.3% in adults.<sup>1</sup> As the paediatric foot is flexible and its skeletally immature bones are less brittle, they have higher elastic resistance than adult bone. Thus the talus of a child can sustain higher force before it fractures. The fracture of neck of talus is a more common fracture site than talar body. Immobilisation by applying cast is the treatment of choice for non-displaced fractures but surgery is needed for displaced fractures of the talus to lower the risk of complications such as avascular necrosis etc.

## CASE REPORT

A 9 year old boy was brought to the emergency department with a history of fall from stairs of a height between 4 to 5 feet, while playing. On physical

examination there was bruising over medial aspect of left ankle. Swelling was present over the left ankle but there was no evident deformity. He was unable to bear weight on his left foot. There was tenderness and crepitus on palpation and movements of the left ankle joint were painful and restricted. Peripheral pulses were palpable and there was no evident distal neurovascular deficit. Patient underwent x rays of left foot. Radiological findings were suggestive of fracture neck talus left foot as shown in figure (a). Below knee slab was applied and patient was prepared for surgery.

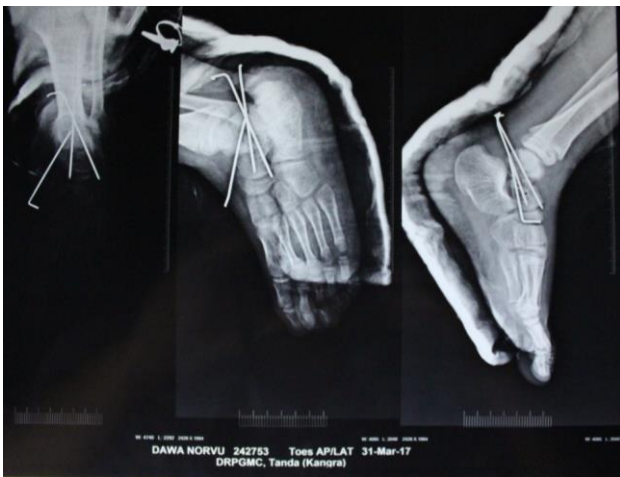
**Surgery:** Patient underwent closed reduction and internal fixation with K wire. Post op ankle and foot radiographs showed fixation of fracture neck talus done with closed pinning using 3 K wires as shown in figures (b).

**Prognosis:** A child's bones heal faster than an adult's because a thicker, stronger, and more active dense fibrous membrane (periosteum) covers the surface of their bones.

Our patient showed spectacular improvement as judged within his one and half year of his follow up.



**Figure 1: Pre operative x ray.**



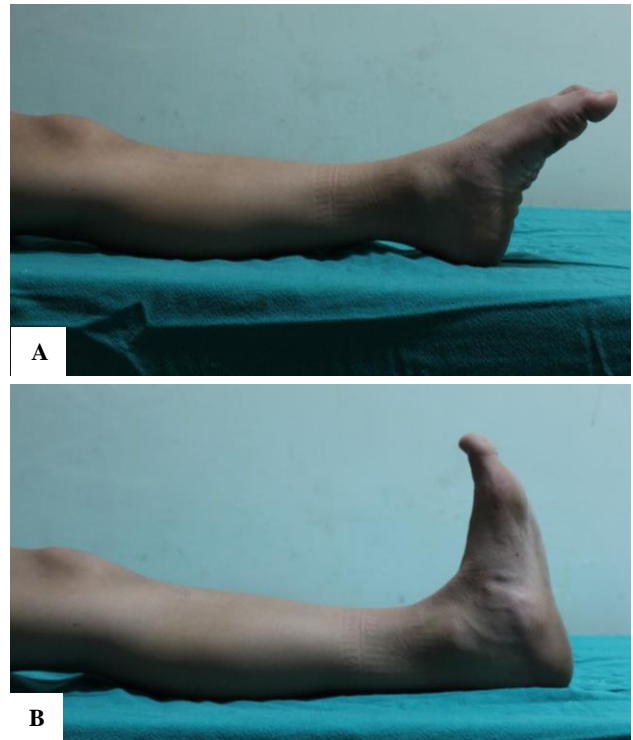
**Figure 2: Post op x ray.**



**Figure 3: X ray of left foot after at 3 month follow up.**



**Figure 4: X ray of left foot after 18 months of follow up period.**



**Figure 5: (A and B) Pictures depicting full range of movements of left ankle joint at 18 months follow up.**

## DISCUSSION

Talus is the bone which links the leg and the foot. It bears the weight of the body more or less and can fracture occasionally when it undergoes the stress of trauma. Talus fractures are very rare in children however among those few cases which occur, talus neck fractures are more common than the talus body fractures.

Talus fractures are classified according to The Hawkins classification, and its subsequent modification by Canale and Kelly. The development of posttraumatic vascular necrosis depends upon the type of injury. The modified

Hawkins classification is simple and reliable as it is based on plain injury x rays.<sup>2</sup> Fractures of the neck of the talus based on the modified Hawkins classification are :-

- Type I fracture:- talar neck fracture.
- Type II:- talar neck fracture with subtalar dislocation.
- Type III:- talar neck fracture with subtalar and tibiotalar dislocations.
- Type IV:- talar neck fracture with subtalar, tibiotalar, and talonavicular dislocations.

Aurelien et al published a case report of a 4-year-old girl with minimally displaced talar neck fracture. The patient was treated conservatively and full functional results were achieved i.e. foot and ankle could be mobilised completely without any pain, after a long period of 22 months. They concluded that talus fracture is an uncommon in children and can be missed during diagnosis. Conservative management by applying a cast is the treatment of choice for non displaced or minimally displaced fractures of talus neck but these cases need a long term follow up.<sup>3</sup>

The diagnosis and treatment of talus neck fractures is always surrounded by controversies. Baumhauer et al stated that these controversies are there because of the rare incidence of these fractures and because of the sparse data we have on the clinical based research in treatment outcomes.<sup>4</sup>

Smith et al conducted a study including 29 children with talus fractures. The average age of children was 13.5 years. They reported that there were far more complications in displaced paediatric talus fractures and in those associated with high-energy trauma. The incidence of complications was - avascular necrosis (7%), arthrosis (17%), delayed union (3%), neurapraxia (7%) and the need for further surgery (10%). They also found that talus fractures were more common and more severe among older boys.<sup>5</sup>

Jensen et al reported that minimally displaced and undisplaced fractures of the talus have an excellent long-term prognosis in the paediatric population. Though complications such as avascular necrosis of the body of the talus have been reported in children even after minimally displaced fracture but they usually occur after the fracture-dislocation of the talus.<sup>6</sup>

A minimally displaced or undisplaced fracture of talar neck is difficult to catch and hence leads to delayed diagnosis many a times. Rammelt et al stated a similar case where a 5 year old child who had sustained a minimally displaced fracture of talar neck developed avascular necrosis 6 months after the injury. The child had to undergo 12 months of non-weight bearing and was followed until 36 months after the injury when he developed near full functional recovery.

The review of literature revealed that the incidence of AVN after non-displaced talus fractures is 16% in children which is far more than what is reported in adults. 72% cases were between 1 and 5 years hence they concluded that immature talus is more prone to avascular necrosis as none of the children were above 9 years. Long term non weight-bearing cannot be recommended as it does not alter the course of the disease.<sup>7</sup>

Displaced fractures of the ankle are a common occurrence in orthopaedic practice but displaced talar fractures are uncommon. Ankle fractures occur because of indirectly applied low energy forces, whereas talus fractures occur because of high energy axial loading. The complications of either of these fractures can be avascular necrosis, posttraumatic arthritis, or soft tissue loss despite these differences. Complications may occur because of the innate features of the injury, because of failure to achieve treatment objectives, because of overt treatment goals, or because of delayed diagnosis from overlooking subtle clinical or radiographic signs. These are the pitfalls in the treatment of talus fractures.<sup>8</sup>

## CONCLUSION

We have discussed here a rare case of paediatric talus neck fracture which was managed with closed reduction and internal fixation with K wires. The child had no Post op complications. The patient was followed until 18 months after the injury with full functional recovery.

Paediatric talus fractures are rare form of injuries and misdiagnosis can be avoided with precision and high index of suspicion. Mechanism of injury includes axial loading of the talus with the dorsiflexed foot. Outcomes of both conservative and surgical treatment are more or less similar. Avascular necrosis after paediatric talus fractures is rare but has been reported in cases of displaced fractures.

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