

Bilateral talus neck fracture in an 11-year-old patient resulting from a fall from height: A case report

Emre Teksan¹, Sercan Karadeniz²

¹ Giresun University, Prof. Dr. İlhan Özdemir Training and Research Hospital, Department of Orthopedic and Traumatology, Giresun, Turkey

² Bulancak State Hospital, Department of Orthopedic and Traumatology, Giresun, Turkey

ORCID ID of the author(s)

ET: 0000-0001-9389-504X
SK: 0000-0003-2802-4816

Abstract

We here present an 11-year-old patient with bilateral Hawkins type 3 talus neck fractures resulting from a fall from height. When the patient was brought to the Emergency Department, the ankles were edematous and there were bilateral talus neck fractures with subtalar dislocation. The taluses on both sides were entered with anteromedial and anterolateral incisions, and after an open reduction, the fractures were fixed with one cannulated screw from the anterior and one from the posterior side. No additional edema developed. The patient was followed up for 2 days in the ward, then discharged with outpatient follow up recommendations. Pediatric bilateral talus neck fractures are rare and must be treated immediately.

Keywords: Bilateral talus neck fracture, Pediatric fractures, Trauma

Introduction

Pediatric talus neck fractures are not common, and bilateral fractures are exceedingly rare. These fractures occur because of high energy trauma, and may be accompanied by soft tissue lesions, other bone fractures, and other life-threatening injuries [1].

The talus plays a key role in a considerable proportion of foot and ankle movements. However, intraosseous blood circulation in the talus is insufficient and it is fed extraosseously by vessels originating from the tibialis posterior, peroneal, and dorsalis pedis arteries [2, 3]. The ratio of displacement of the fracture and whether the subtalar-navicular joint is dislocated have significant effects on the blood supply of this bone [4, 5].

Diagnosis is usually made by anteroposterior and lateral x-rays. Computed tomography (CT) can be used to better understand the fracture morphology and the presence of other accompanying bone pathologies.

Talus neck fractures are orthopedic emergencies. While plaster casting may be sufficient for non-displaced type 1 fractures, the treatment for types 2, 3, and 4 fractures is open reduction followed by fixation with compression screws.

Bilateral talus neck fractures are rare in children and require more thorough care than in adult patients.

Corresponding Author

Emre Teksan

Giresun University, Prof. Dr. İlhan Özdemir Training and Research Hospital, Department of Orthopedic and Traumatology, Giresun, Turkey
E-mail: emreteksan@yahoo.com

Informed Consent

The authors stated that the written consent was obtained from the patient presented with images in the study.

Conflict of Interest

No conflict of interest was declared by the authors.

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Case presentation

Following a fall from height, an 11-year-old boy was brought to the Emergency Department. Both ankles were sensitive, painful, and edematous. Radiographs revealed bilateral Hawkins type 3 talus neck fractures (Figure 1, 2). Following emergency closed reduction of both ankle fractures, placement of splints and elevation, the patient was admitted for emergency surgery.

Open reduction and internal fixation were planned for both ankles. Both lower extremities were prepared, and the operation began on the right side. The talus was reached with anteromedial and anterolateral incisions. Open reduction of the fracture was performed both medially and laterally. For fixation, a screw was advanced from the anteromedial aspect posteriorly, and one screw was advanced percutaneously postero-anteriorly. The left-side ankle was then treated. The fracture line was reached with anteromedial and anterolateral incisions and open reduction was performed; then, the fracture was fixed with two screws. The reductions and fixations were confirmed with fluoroscopy (Figure 3 – 6). The patient was followed up in the ward for two days and no additional edema developed. Informed consent was obtained from the patient’s family for scientific presentation.

Figure 1: Preoperative right-side view of the Hawkins type 3 talus fracture (arrow)



Figure 2: Preoperative left side view of the Hawkins type 3 talus fracture (arrow)



Figure 3: Postoperative right side anteroposterior view



Figure 4: Postoperative right side lateral view



Figure 5: Postoperative left side anteroposterior view



Figure 6: Postoperative left side lateral view



Discussion

Talus neck fractures generally result from axial load bearing while the foot is in dorsiflexion [6, 7]. This mechanism was classified by Hawkins according to the degree of displacement of the fracture.

In 1970, Hawkins [8] published the surgical results of 57 talus fractures of 55 patients. In non-displaced fractures (type 1), there was no avascular necrosis (AVN) and union was obtained in all fractures without problems. In type 2 fractures, which included subtalar joint dislocation, no non-union was observed and AVN was observed at the rate of 42%. In type 3 fractures accompanied by both subtalar and tibiotalar joint dislocation, the rates of non-union and AVN were 11% and 91%, respectively. Due to the high rates of non-union and AVN, talus neck fractures must be treated immediately, and fixation should be performed as anatomically as possible.

Canale and Kelly [9] evaluated the clinical and radiological outcomes of 71 talus neck fractures of 70 patients with a mean 12.7-year follow-up period. There were some type 1 fractures which developed AVN; however, the clinical outcomes of those cases were very good. In type 3 fractures, the clinical results were closely related to subtalar dislocation and the reduction of fracture fragments. The main aims of treatment should be a thorough evaluation of all talus neck fractures, not leaving the joint subluxated after the operation, and obtaining anatomic alignment of all the fracture fragments as much as possible. It should be kept in mind that following fracture union, the clinical results can be good, independent of AVN.

Talus fractures are uncommon in childhood, and bilateral fractures are very rare. To the best of our knowledge, no pediatric bilateral talus fractures were reported in the literature.

References

1. Abdelgaid SM, Ezzat FF. Percutaneous reduction and screw fixation of fracture neck talus. *Foot Ankle Surg.* 2012;18(4):219-28.
2. Murphy GA. Fractures and dislocations of the foot. *Champhbell's Operative Orthopaedics* 2003; pp. 1136-1138
3. Sean EN, David PB. *Orthopaedic Knowledge Update 9, AAOS, 2008; p : 499-502.*
4. Inokuchi S, Ogawa K, Usami N, Hashimoto T. Long-term follow up of talus fractures. *Orthopaedics.* 1996;19:477-81.
5. Pajenda G, Vécsei V, Reddy B, Heinz T. Treatment of talar neck fractures: clinical results of 50 patients. *J Foot Ankle Surg.* 2000;39:365-75.
6. Smith NP, Ziran BH. Fractures of the talus. *Operative Techniques Orthopaedics.* 1999;9:229-38.
7. Mark MD, Stephen R. Thompson MD. *Review of Orthopaedics (Miller, Review of Orthopaedics) 6th Edition.* 2012; p:769
8. Hawkins LG. Fractures of the neck of the talus. *J Bone Joint Surg [Am].* 1970;52:991-1002.
9. Canale ST, Kelly FB Jr. Fractures of the neck of the talus. Long-term evaluation of seventy-one cases. *J Bone Joint Surg [Am].* 1978;60:143-56.

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