***Case Study***

# Antero-medial Closed Enucleation of the Talus: A case report


## ABSTRACT

The enucleation of the talus is a rare lesion, very little described in the literature. It is a serious injury and the functional prognosis of the ankle is compromised by the high risk of osteonecrosis.

We report the exceptional case of a closed and antero-medial enucleation of the talus in a 28-year-old man who presented to our emergency department following a fall from a 5-meter hight.

Per-operative assessment revealed that the talus remained partially connected to the foot and ankle by capsular attachments. The talus was very carefully reduced so farther damage to the blood supply could be avoided. Then a navicular-talar pinning was achieved under fluoroscopy-control. A repair of the medial capsular-ligamentary structures was performed and a careful closure of the skin has been achieved.

An immobilization was associated for 8 weeks then the Kirschner wires were removed and a rehabilitation program of 8 weeks was indicated.


*Keywords: Ankle; Talus; Astragalus; Dislocation; Extrusion; Enucleation; Surgery; Outcome.*

## 1. INTRODUCTION

Enucleation or triple dislocation of the talus is a rare traumatic lesion representing only 0.06% of all dislocations and 2 % all talar injuries [1,2]. Few cases of total enucleation of the talus have been reported in the literature, 75% of them are open enucleations and 86% are antero-lateral [3]. A closed and antero-medial enucleation of the talus is exceptional.

The fact that the talus has no muscular attachment with 70% of its surface being articular makes its vascularization precarious predisposing to a high risk of damage to the blood supply in case of trauma [4].

## 2. CASE REPORT

We report the case of a 28-year-old man, without any relevant medical history, who presented to our emergency department following a fall from a height of approximately 5-meters. He was complaining of severe pain in his left ankle and foot.

Initial examination showed swelling of the left foot and ankle without major deformity. A filling of the medial arch of the foot with a palpable prominence was observed. The skin was very tense, but intact, over the prominence (Fig.1). Neurovascular examination was normal.

Fig.1. Pre-operative aspect of the left foot and ankle showing a filling of the medial arch of the foot with a palpable prominence.

Plain radiographs of the left ankle revealed an antero-medial enucleation of the talus with a comminutive fracture of the lateral malleolus (Fig.2).

Fig.2. Plain radiographs of the left ankle revealed an antero-medial enucleation of the talus with a comminutive fracture of the lateral malleolus.

A CT-scan was performed showing the medial, anterior and caudal displacement of the talus without an associated talar fracture (Fig.3).

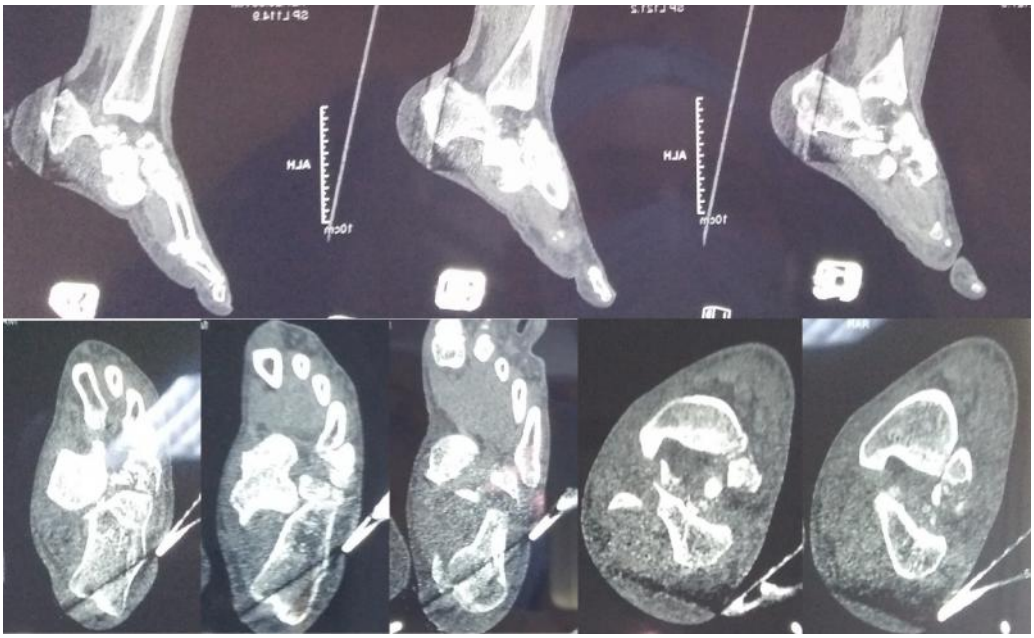

Fig.3. CT-scan was performed showing the medial, anterior and caudal displacement of the talus without an associated talar fracture.

The patient had no other major injuries. After appropriate resuscitation, the patient was immediately transferred to the operating room.

Under general anesthesia, a medial approach to the ankle was performed. Per-operative assessment revealed that the talus remained partially connected to the foot and ankle by capsular attachments. Using eversion and planter flexion maneuvers, the talus was very carefully reduced so farther damage to the blood supply could be avoided. Then a navicular-talar pinning was achieved under fluoroscopy-control.

A repair of the medial capsular-ligamentary structures was performed and a careful closure of the skin has been achieved with disappearance of the medial prominence revealing a normal medial arch of the foot (Fig.4).

Fig.4. Post-operative aspect of the left foot and ankle showing the disappearance of the medial prominence revealing a normal medial arch of the foot.

Post-operative radiographs of the left foot and ankle showed good reduction of the talus (Fig.5).

Fig.5. Post-operative radiographs of the left foot and ankle showed good reduction of the talus.

An immobilization with a splint was associated for 2 weeks followed by an above-the-knee cast for 3 weeks then a below-the-knee cast for 3 more weeks. After removal of the cast, the Kirschner wires were also removed and a rehabilitation program of 8 weeks was indicated.

At the last follow-up of 10 months post-operatively, the patient was satisfied with a good functional and aesthetic outcome. Radiography revealed no degenerative changes or proof of avascular necrosis.

## 3. DISCUSSION

The talus is exposed to a significant traumatic risk by its intermediate position between the leg and the foot, and the absence of muscular or tendinous insertion. It is highly stressed during walking and other activities while being at the center of a highly mobile joint complex [2,4].

The enucleation of the talus is a rare lesion, very little described in the literature. It is a serious injury and the functional prognosis of the ankle is compromised by the high risk of osteonecrosis [1].

The direction of the enucleation is variable, the talus is more often antero-lateral but may be antero-medial, and more rarely postero-medial [5].

physio-pathological mechanism is still discussed; Leitner [4] believes that the total dislocation of the talus results either from excessive supination or from excessive pronation, accordingly, the dislocated talus displaces either laterally or medially.

The treatment advocated by the different authors is far from being univocal. Currently, the majority of authors agree on the conservative treatment of enucleations [6–9], and reserve arthrodesis for secondary septic complications and secondary osteonecrosis.

The reduction of the enucleation of the talus must be done in emergency to prevent farther damage to the blood supply and to the underlying skin [7].

Open reduction through a medial approach in case of antero-medial enucleation and lateral approach for antero-lateral enucleation, offers the advantage of capsular-ligamentary structures repair, but only in case of failure of closed reduction [9].

Additional navicular-talar and/or talar-tibial Kirschner pinning is usually needed to maintain stability. Post-operative immobilization by cast is recommended for 8 weeks followed by a rehabilitation program [8].

The outcome of talar enucleations is overpowered with a high incidence of complications, such as infection, avascular necrosis, and long-term ankle arthrosis [6].

## 4. CONCLUSION

Total antero-medial closed enucleation of the talus is exceptional and only a few cases have been reported in the literature. Reduction of antero-medial enucleation is more difficult than the other types of enucleations and an open reduction is usually inevitable.

Once the Talus is reduced, the medial approach offers the advantage of capsular-ligamentary structures repair. The functional outcome is unpredictable and mainly depends on the occurrence of avascular necrosis.

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