

SURGICAL TREATMENT IN HAWKINS I TYPE TALUS NECK FRACTURES: A CASE REPORT

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ABSTRACT

Talus fractures are a rare occurrence, accounting for about 0.5% of all fractures. These fractures are classified into 4 types, according to Hawkins. Hawkins type 1 fractures are compound fractures; due to their low incidence, it is difficult to evaluate long-term results and prognosis. This kind of fracture could be treated conservatively, but the importance of surgical treatment should not be underestimated. The present article describes a case of Hawkins type I talar neck fracture, early recognized and successfully surgically treated by percutaneous screws. At a 12-month follow-up, the patient reported returning to full-time employment, resuming all activities without pain or functional limitation. The decision-making in Hawkins type I talus neck fractures is not well defined because of the rarity of the incidence and the low number of cases in the literature. This case report supports the success and good outcomes of a prompt surgical approach in Hawkins Type-1 fractures.

KEYWORDS: *talar neck fracture, Hawkins type I, conservative treatment, surgical treatment*

INTRODUCTION

The talus is the 2nd largest bone of the foot and is covered by 60% cartilage. It has no direct muscle insertions (1) and is characterized by a limited vascular supply (2, 3). Talar fractures are a rare occurrence, accounting for 0.5% of all fractures, but should not be underestimated due to a possible severe prognosis. The average age of these injuries is between 30 and 38 years, with a male/female ratio of 3 to 1. Talus neck fractures represent half of all talus fractures and result from forced foot extension (4, 5).

Ischemic necrosis of the talus body complicates half of talus neck fractures due to the interruption of the main nutritional arteries, which penetrate the bone in the neck (6, 7, 8). According to Hawkins classification (9), talar neck fractures can be classified into four types, each with a different percentage risk of avascular necrosis. TYPE 1: compound fracture of the neck of the talus and without dislocation of the tibio-talar and sub-talus. Risk of osteonecrosis (NAV) 0-15%. TYPE 2: displaced fracture of the neck of the talus with subluxation or dislocation of the sub-talus. NAV 20-50%. TYPE 3: displaced fracture of the neck of the astragalus with subluxation or dislocation of the sub-talar and tibia-talus. NAV 70-100%. TYPE 4: displaced fracture of the neck of the astragalus with subluxation or dislocation of the sub-talus, tibio-talar, and talus-navicular. NAV 100%. The present case regards a 21-year-old man affected by a talus fracture

Hawkins type 1. The therapeutic algorithm is debated due to the rarity of fractures. After a detailed presentation, the case will be discussed.

CASE PRESENTATION

A 21-year-old man came to the emergency room for orthopedic counseling. He reported sprained trauma of his right ankle due to an accidental fall from the stairs of his home, describing a movement of dorsal hyperflexion of the foot during the landing phase. An edematous and tumid ankle was observed, with widespread pain at the tarsal level. The patient, a tattoo artist by profession, was a heavy smoker (> 20 cigarettes/day) and had no history of comorbidities. Anteroposterior, oblique, and lateral ankle radiographs showed a compound talus fracture (Fig. 1).

The ankle was immobilized with a high-knee cast. A CT scan with 3D reconstructions was performed to study the fracture better and its joint involvement, showing a compound fracture of the neck of the talus (Fig. 2). Taking into account the ankle edema, the patient's heavy smoking history and his high functional demand, an osteosynthesis treatment was opted for. The fracture was synthesized with two cannulated screws with a washer of 4 x 45 mm and 4 x 40 mm in anteromedial percutaneous access (Fig. 3). The patient was discharged with a ban on loading on the operated limb, a plaster cast, and anti-thromboembolic prophylaxis. The plaster cast was removed after 30 days, and the patient was allowed to walk with a skimming load for the following 30 days. After 60 days from surgery, complete weight bearing was permitted, but sports were not allowed for another month. The patient had no clinical and radiographic signs of avascular necrosis 120 days after surgery, with an AOFAS score of 100/100. A new clinical and radiographic evaluation was performed about 1 year later (Fig. 4, 5). The patient reported returning to his full-time employment, resuming all activities in the absence of pain, and showing extreme satisfaction with the treatment received.



Fig. 1. Pre-operative X-ray.



Fig. 2. Sagittal view of pre-operative CT scan.



Fig. 3. Post-operative X-ray.



Fig. 4. X-ray under load one year after surgery.



Fig. 5. Clinical image one year after surgery.

DISCUSSION

The rarity of Hawkins I fractures means their management is not well established. Furthermore, it is not easy to assess the long-term prognosis. Although infrequent, these injuries may have devastating complications. Therefore, their evaluation requires a good understanding of the biology, vascularization, and anatomy of the talus (10). Type I neck fracture may be eligible for non-surgical treatment (11). Conservative treatment is a rational choice if the fracture is compound and the joint surfaces are aligned. The non-surgical treatment requires immobilization and a prolonged absence of load, with complications that can include loss of reduction of the fracture but also excessive stiffness of foot and ankle, algodystrophy, and osteopenia. For Kopp et al. (12), internal fixation is indicated in non-displaced Hawkins type 1 fractures. For Abdelkafy et al. (13), internal fixation of a simple talus neck fracture usually requires 2 screws in compression.

Morphometrically, it should be considered that the neck of the talus deviates medially with respect to the long axis of the talar body and plantarly. The aim is to position the screws to provide maximum interfragmentary compression at the fracture site. This leads to an increase in the probability of absolute stability with consequent reduction of complications such as avascular necrosis of the body of the talus. However, it is worth considering how the surgical approach to talar lesions should be performed by experienced surgeons. For Zeman et al. (14) the outcome of these procedures depends on the experience and skills of the surgeon and the system organization of the surgical department.

This case report deals with the surgical treatment of a Hawkins I fracture. The patient's smoking, his high functional demand, with the need to return to daily habits as quickly as possible have directed our decision-making toward a synthesis with 2 percutaneous screws. The patient started ankle mobilization at 30 days, freeing him from immobilization and starting the grazing load earlier. Swanson et al. (15) show that rigid internal fixation of type I talus neck fractures allows for early ankle mobilization. Conversely, conservative treatment presupposes a resumption of weight after 6-8 weeks (11). About 12 months after surgery and 120 days after surgery, our patient reported an AOFAS score of 100/100, proving extremely satisfied with the treatment received.

CONCLUSIONS

Type I talus neck fractures, according to Hawkins, are rare injuries that can lead to unpleasant and potentially complex complications. The decision-making on their treatment is not well established due to their low incidence and the rarity of case reports in Literature. This case report supports the success and positive outcomes of a prompt surgical approach in Hawkins Type-1 fractures.

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