

Tibiotalar dislocation without associated fractures: a case report

Luxação tibiotalar sem fraturas associadas: relato de caso

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ABSTRACT

Isolated tibiotalar dislocation is an uncommon injury and is frequently associated with fractures and related to high-energy accidents. We report a case where a 24-year-old male patient suffered an axial trauma resulting in a closed posterior pure tibiotalar dislocation. The treatment was performed with bloodless reduction, immobilization and outpatient follow-up. Four months after the injury, the patient reported no pain and had a satisfactory range of movement, with no residual instability or onset of post-traumatic osteoarthritis. The mechanism of trauma, immediate treatment, the importance of closed and stable reduction and early mobilization are discussed in this case.

Level of Evidence V; Expert Opinion.

Keywords: Dislocation; Ankle; Fracture; Case reports.

RESUMO

A luxação tibiotalar isolada é uma lesão incomum, frequentemente associada a fraturas e relacionada a acidentes de alta energia. Relatamos um caso de um paciente de 24 anos, do sexo masculino, que sofreu um trauma axial resultando em uma luxação pura tibiotalar posterior fechada. O tratamento foi realizado com redução incruenta, imobilização e acompanhamento ambulatorial. Quatro meses após a lesão, o paciente não relatava dor, tinha arco de movimento satisfatório, sem instabilidade residual ou início de osteoartrite pós-traumática. O mecanismo do trauma, o tratamento imediato, a importância da redução fechada e estável e a mobilização precoce são discutidos neste caso.

Nível de Evidência V; Opinião de Especialista.

Descritores: Luxações articulares; Tornozelo; Fratura; Relatos de casos.

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INTRODUCTION

Isolated tibiotalar dislocation is an uncommon injury and is frequently associated with fractures (including of the malleoli, talus, calcaneus or metatarsals). Falls, motor vehicle accidents and sports traumas are the most frequent causes related to this type of injury. A review in the

literature⁽¹⁾ covering 16 cases of tibiotalar dislocation showed that only 25% of the considered cases were posterior dislocations and 50% were exposed injuries. In most of the reported cases, the injury was posteromedial. In general, the prognosis is good, with closed injuries, rapid reduction, immobilization and rehabilitation⁽²⁾. The objective of this

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study was to report the clinical and radiological results of an undiagnosed injury and to compare them with possibly similar studies through a bibliographic review of the subject.

CASE REPORT

The study was approved by the Research Ethics Committee and was registered in the Brazil Platform under the CAAE number 77239417.6.0000.5226.

The 24-year-old patient reported in the case suffered direct trauma to the right ankle in the axial direction against a fixed guardrail while practicing “street luge” (a street sports activity where the individual goes down steep roads supine on a skateboard), as shown in Figure 1. The patient presented to the immediate care unit complaining of pain and presenting with discreet edema and visible deformity of the ankle (Figure 2). Prior to the injury, the patient had no history of hospitalizations, musculoskeletal diseases, fractures, trauma or ankle pain. At physical examination, the joint was incongruent with a posterior deformity. There was no lesion on the skin, but the range of motion of the tibiotarsal joint was blocked and associated with severe pain. The patient presented a rhythmic, symmetrical full pulse with warm extremities and a capillary filling time of less than two seconds and without alterations in sensitivity to the neurological evaluation (thermal, tactile and painful guided by dermatomes). Radiographic examinations illustrated a posterior pure tibiotalar dislocation without associated fractures (Figure 3).



Figure 1. Visible deformity at the trauma site
Source: Author's personal archive.

A closed reduction of dislocation was performed in the emergency room with the patient in a supine position. The assistant held the leg and stabilized the tibia and fibula, and a maneuver of axial traction was performed on the ankle; the first attempt of reduction was successful. After the maneuver, the patient reported moderate pain relief and maintenance of joint congruence in a plaster cast. Postoperative control radiographs were performed, which confirmed joint congruence, followed by immobilization with a plaster cast (Figure 4). The patient was monitored in outpatient follow-up with the foot and ankle team of the orthopedic and traumatology department.

During the follow-up, the patient used immobilization in a neutral position and load restriction for six weeks. Seven



Figure 2. Ankle deformity in hospital care
Source: Author's personal archive.



Figure 3. Radiographic study showing posterior pure tibiotalar dislocation
Source: Author's personal archive.

weeks after the injury, the patient started using partial support with a brace (Robofoot) and crutches for another 4 weeks and then started full support without using a brace, in conjunction with gait training and active and passive mobilization to gain/maintain a range of motion during physical therapy. At this stage, a control X-ray and MRI were obtained to investigate the associated injuries. The examination conducted three months after the injury (Figure 5) illustrated diffuse subchondral periarticular effusions in the ankle bones with a mottled aspect, which is compatible with reflex dystrophy, and a complete rupture of the anterior and calcaneofibular talofibular ligaments as well as the deep tibiotalar section of the deltoid ligament complex and a small anterior tibiotalar articular effusion and posterior subtalar effusion, with signs of synovitis. In the physical examination performed 14 weeks after the injury,

the patient presented 10° dorsiflexion, 30° plantar flexion, 5° eversion and 10° inversion.

After 8 months, the patient was evaluated. The patient presented no pain, exercised (ju-jitsu and "street luge") and had a good range of motion, with 15° dorsiflexion, 45° plantar flexion, 10° inversion and 8° eversion. There was still no residual instability at the physical examination (anterior and posterior drawer tests and varus and valgus stress tests). The patient was also evaluated using the American Orthopedic Foot and Ankle Society's (AOFAS) Ankle Hindfoot Scale and the 36-Item Short Form Health Survey (SF-36). The patient presented a good cultural level and had no difficulty answering the questionnaires. The health questionnaire SF-36 takes into account 8 domains (functional capacity, limitation by physical aspects, pain, general health, vitality, social aspects, emotional aspects and mental health), and the score ranges from 0 to 100, where zero corresponds to the worst state of health and 100 to the best state of health. In the analysis of the results, the patient reached the maximum score in functional capacity, vitality, social and emotional aspects, 97 points in mental health, 90 points in limitation by physical aspects and 95 points in pain. In the evaluation of the AOFAS scale for the back and ankle, the maximum score was reached. The AOFAS scale is a questionnaire that consists of nine items divided into three categories: pain (40 points), functional aspects (50 points) and alignment (10 points); its total score is 100 points, which indicates normal functionality. After evaluating the questionnaires and the physical examination results, normal ankle function was characterized.



Figure 4. Post-reduction control radiography
Source: Author's personal archive.

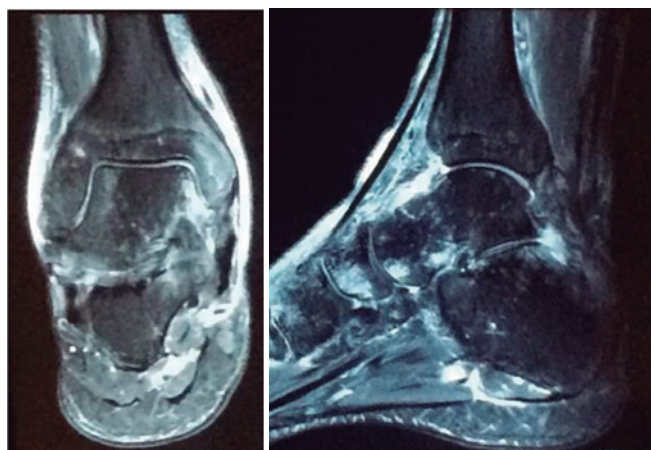


Figure 5. Magnetic resonance imaging showing injuries
Source: Author's personal archive.

DISCUSSION

Most tibiotalar dislocations are exposed and/or accompanied by fractures, with pure dislocations being closed infrequently. In a study of 123 patients published in 2012 in São Paulo regarding foot and ankle injuries in recreational sports, dislocations accounted for only 2% of ankle injuries, with sprains being the most common injury, representing 49% of the cases⁽³⁾. According to a systematic review conducted in 2017, the estimated incidence of pure ankle dislocation was 0.065% in patients presenting to the emergency room with ankle injuries⁽⁴⁾. The rarity of this injury can be explained by the strong ligament and capsular complex around the ankle. In addition, the injury depends on both the direction of the displacement and the energy of the trauma. Open posteromedial dislocations are more commonly reported and are related to high-energy injuries.

When searching for pure tibiotalar dislocation in the MEDLINE database, 18 cases were detected, with the majority being subtalar dislocations and open dislocations in patients with a predisposition to the injury (such as hypoplasia of the talus and malleoli, muscular weakness and repetitive sprains). There were cases of dislocation without fractures associated with tendon interposition, anterior pure tibiotalar dislocation and posteromedial pure tibiotalar luxation⁽⁵⁾.

The mechanism of trauma that is most associated with tibiotalar luxation is a combination of inversion and maximal plantar flexion together with the axial load⁽⁶⁾. In our report, the trauma mechanism was described as axial, with the patient in the dorsal decubitus position.

The diagnosis is easily performed through simple radiography. However, a tomographic study may be necessary after reduction to better evaluate the non-diagnosed osteocartilaginous injuries that cannot be diagnosed by standard radiography. MRI has gained prominence in increasing the evaluation of musculoligament injuries⁽⁷⁾ because it shows, in detail, the major changes found in a case of pure dislocation, such as cartilage and ligament injury.

Regarding the follow-up for this type of injury, a review of 19 cases⁽⁸⁾ indicated that closed injuries usually have functionally insignificant instability, loss of movement and no radiographic evidence of degenerative changes. There are divergences in the international literature regarding immobilization time. In the series evaluated by à la Denise

et al.⁽⁹⁾, an immobilization time between 6 and 9 weeks was observed. In our report, the patient used full-time immobilization for 10 weeks, with good recovery and evolution after this period.

Analyzing the results and relating them to the literature, we understand that the reduction of the dislocation in a short time, immobilization time and adequate physiotherapy were the predominant factors for good functional recovery^(1, 6).

Concerning complications, differences were also observed in the literature. In their review, Wight et al.⁽⁴⁾ reported that most patients evolved without any complications. Among the symptomatic patients, after treatment, the most common associated complication was joint stiffness, followed by post-traumatic ankle arthritis. Sayit et al.⁽¹⁰⁾ reported degenerative changes of the ankle as the most common associated complication.

CONCLUSION

Closed posterior pure tibiotalar dislocation is rare and little reported in the literature. Upon relating the literature to this study, we verified that with a rapid and satisfactory orthopedic treatment performed in an emergency (closed reduction and immobilization), combined with specialized outpatient orthopedic care and rehabilitation with physical therapy, are crucial factors for an evolution with good clinical results.

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