Case Report

Weber type C ankle fracture in a soccer player and the value of a critical analysis by ankle arthroscopy—a case report

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Abstract: A 32-year-old male professional soccer player was tackled during practice on the left ankle. Convectional radiography revealed supra-syndesmotic peroneal fracture (Weber type C) with indirect signs of ankle instability. This type of fractures are often associated with syndesmosis injuries and misdiagnose or malreduction may lead to a long delay in full recovery or even to post-traumatic ankle arthritis. Ankle arthroscopy is becoming a useful and widespread technique with multiple applications. Recently, several studies have supported ankle arthroscopy as the most reliable exam in the diagnose of syndesmosis injuries. In our case, we describe the advantage of complementing conventional open reduction and internal fixation approach of Weber type C ankle fracture with ankle arthroscopy. We were able to verify syndesmosis reduction as well as detect and treat an important talar osteochondral lesion.

Keywords: Ankle fracture; syndesmosis injury; sports

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Introduction

Acute ankle fractures are among the most common sports fractures affecting the lower limb (1,2). Syndesmotic injuries may be present and are often associated with Weber type C Ankle Fracture (3,4). In these cases, an accurate reduction of the fibula in the fibular notch and the assessment of the presence of chondral lesions are essential to obtain good clinical outcomes (4-7). Ankle arthroscopy is a recent tool in the treatment of these fractures as it is possible to simultaneous diagnose and treat lesions but also address the fracture and syndesmosis position after a classical open reduction and internal fixation (8,9). The direct visualization of the tibiofibular joint provided by the ankle arthroscopy may help to diminish the malreduction rate (10).

We report a case of a male professional soccer player with a Weber type C ankle fracture diagnosed and managed with ankle arthroscopy. This manuscript was written in accordance with the CARE Guidelines (11).

Case presentation

A 32-year-old male professional soccer player with no medical history suffered a direct trauma on the lateral side of the left ankle during practice. He immediately developed ankle pain and swelling with intolerable weight bearing on the left inferior limb. The clinical examination did not show any deformity or neurovascular impairment.

The findings from conventional radiography of the left ankle revealed supra-syndesmotic peroneal fracture with indirect signs of ankle instability (*Figure 1*).

The athlete was submitted to surgical treatment. Ankle arthroscopy (2.7-mm 30° arthroscope) under thigh tourniquet was performed using standard anteromedial and anterolateral portals before and after conventional open reduction and internal fixation of the lateral malleolus. The methodical arthroscopic evaluation was similar to the protocols described in the literature (12).

In the first arthroscopic approach we found and removed

Figure 1 Left ankle radiological images revealing a supra-syndesmotic peroneal fracture.

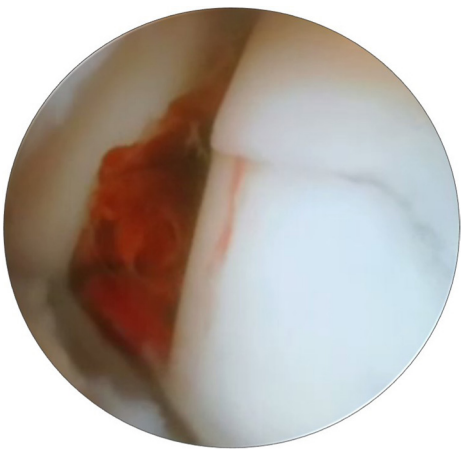

Figure 2 Arthroscopic view of the anterior-inferior tibiofibular tear between tibiotalar joint.

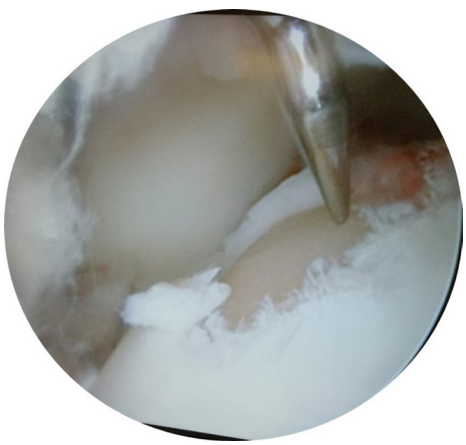

Figure 3 Arthroscopic view treating the talus's osteochondral lesion with microfractures.

articular loose bodies and identified an anterior-inferior tibiofibular tear between tibiotalar joint (*Figure 2*). The presence of osteochondral lesions was identified and these were properly debrided and treated with microfracture (*Figure 3*).

Secondly, through an incision over the lateral border of the lateral malleolus, the peroneal fracture was addressed and reduced with the standard technique: an interfragmentary lag screw and a neutralizing peroneal anatomical plate.

Then, we performed a second arthroscopy where we debrided the anterior-inferior tibiofibular ligament between the tibiotalar joint, tested and identified the syndesmosis instability (*Figure 4*). Finally, we reduced and fixed the syndesmosis opening with an endobutton by direct visualization with the arthroscope (*Figure 5*).

Serial radiographs were taken to assess fracture healing as well as syndesmosis stability during the short follow-up period (*Figure 6*).

Non weight bearing was allowed in the eight weeks after surgery. During this period, the rehabilitation program was based on strength maintenance and full range of motion recovery. At the ninth week, the athlete began protected weight-bearing with crutches and at the tenth and eleventh weeks he was already with full weight-bearing. At that time, the athlete was gradually increasing the muscle strengthening and proprioception exercises.

At the twelfth week, the athlete was back on the field doing running exercises and at the fourteenth week he was back to competition with complete mobility and no complaints, pain or swelling after practice.

Discussion

Ankle fractures account for 10% of acute sport-related fractures with the most participated sport likely representing the main risk (2). The epidemiology of sport ankle fracture patterns is similar to that of standard ankle fracture patterns. However, professional athletes may have a longer rehabilitation period due to the higher level of physical demand. Restoring the articular congruency is a key factor to achieve an optimal outcome in sporting ability (2,13).

Although it may become a lifetime problem, the first goal to recover from an ankle fracture is to diminish at short-term the impact of this injury on the player and to reduce as safely as possible the return to competition. In athletes, these fractures are usually surgically addressed so that early

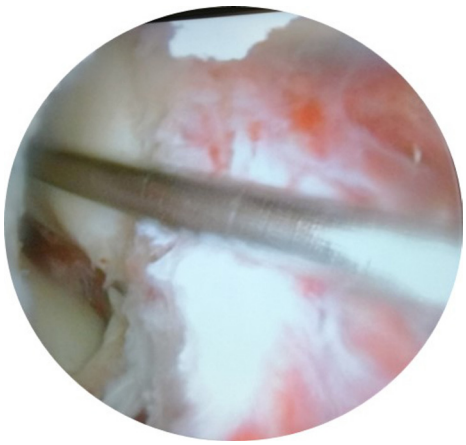

Figure 4 Arthroscopic view identifying the syndesmotic disruption and opening with a probe.

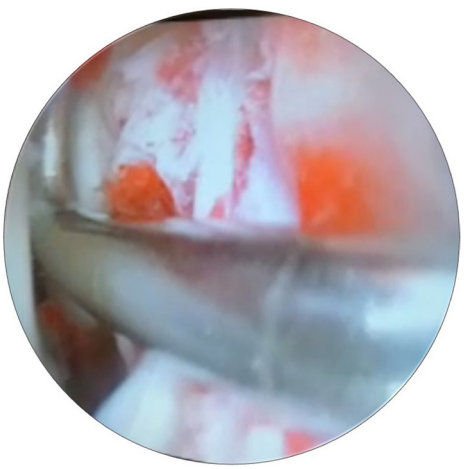

Figure 5 Arthroscopic view testing the stability and closure of the syndesmosis with a probe.

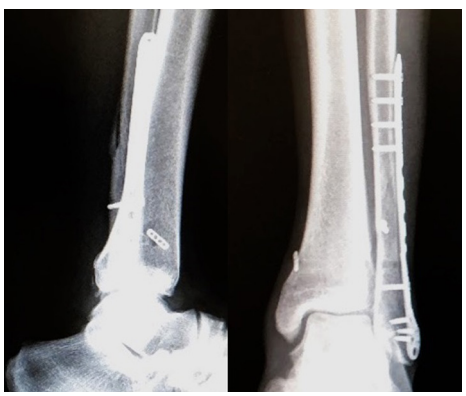

Figure 6 Left ankle radiological images at 3 months of follow-up.

articular mobility is possible and the previous articular function may be achieved sooner.

Weber type-C malleoli fractures are usually associated to syndesmosis disruption and lesions of the cartilage (8,12). Nevertheless, diagnosis and reduction of syndesmosis disruption may be very challenging and its negligence harmful. Its malreduction or improper positioning during ankle fractures is associated with detrimental effects on the articular recovery (14). Osteochondral defects are frequent and occur as a result of the high-energy impact of bony structures in the talar articular surface (15). Preoperative and intraoperative radiographs are very limited in diagnosing syndesmosis disruptions or lesions of the cartilage (14). Computed Tomography (CT) may have a role in diagnosing subtle bony injuries and in pre-operative planning. However, it is not useful in diagnosing syndesmotic instability (4). Kellett *et al.* described Magnetic Resonance Imaging (MRI) as the benchmark imaging standard for syndesmosis injuries diagnose. Unfortunately, besides being an extremely expensive exam, MRI does not provide a dynamic assessment to the distal tibiofibular ligament complex (4,16).

Ankle arthroscopy is spreading fast around the world and several authors believe that it is the most reliable method to detect syndesmosis disruption and intra-articular defects (4,8,10,17). Hintermann *et al.* evaluated prospectively the arthroscopic findings in acute fractures of the ankle in 288 consecutive patients. Lesions of cartilage where found in 79% of patients and the frequency and severity of the lesions increased from Weber type-B to type-C fractures. The authors concluded that arthroscopic could not only find intra-articular lesions but also debride them so that hypothetically the postoperative range of movement would improve more quickly (8).

With ankle arthroscopy it is possible to diagnose, control reduction and treat intra-articular defects in the same surgical time (18,19). We believe that this could also prevent the execution of additional preoperative imaging studies and avoid unnecessary costs. This practice could provide better functional outcomes avoiding the negative impact of missed intra-articular injuries in the outcome (17,18).

Our case reveals the positive impact from ankle arthroscopy, despite the lack of evidence in its usefulness in the treatment of the general malleoli fracture (9). At 3 months of follow-up, the athlete showed no complications and had already achieved full playing function after the rehabilitation program.

Conclusions

Weber C peroneal malleolar fracture is often associated with syndesmosis injuries and misdiagnose or malreduction may lead to catastrophic outcomes, specially on professional soccer players. With ankle arthroscopy we were able to verify syndesmosis reduction as well as detect and treat an important talar osteochondral lesion. We believe arthroscopic-assisted ankle fixation should be a routine procedure in this specific population in order to achieve the best functional outcomes.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/aoj.2019.12.02). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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