CASE REPORT

Arthroscopic reduction and fixation of a lateral inverted osteochondral fracture of the talus ('LIFT')

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SUMMARY

Some ankle sprains hide important lesions beyond the classic lateral ligament complex injuries. The lateral inverted osteochondral fracture of the talus (LIFT) represents a rare osteochondral lesion, whose diagnosis relies on a high clinical suspicion followed by correct image study interpretation. We present a successful arthroscopic fixation of a LIFT lesion in a 45-year-old active man. At 8 months follow-up, the patient was pain free and able to return to his daily activities without limitation. The imagiological study showed osteochondral fragment consolidation with no signs of hardware failure. This midterm results reassemble the need for early diagnosis and correct treatment to achieve a good outcome in these complex and rare osteochondral lesions.

BACKGROUND

Ankle sprains are one of the most common trauma events to deal with in a traumatologist's daily routine.¹ While most cases do not require any special treatment beside the famous RICE (rest, ice, contention and elevation), we must be aware that there are exceptions. In fact, osteochondral (OC) lesions are present in up to 50% of ankle sprains² and are misdiagnosed in 67% of the cases.³

To identify additional ankle lesions in apparent simple sprains, we must pay special attention to unproportioned pain or swelling and inability to walk. Ankle X-ray is the first examination to do in suspected cases, but only 50%–66% of the cases result in an accurate detection of osteochondral lesions.² Thus, if the suspicion remains high with a negative X-ray, it is imperative to perform more sensitive examinations like CT or MRI.^{2,4}

In 2013, Dunlap and Ferckel¹ defined a 'special' type of osteochondral lesion where the osteochondral loose body turns, during the traumatic event, in a flip coin-like mechanism and its cartilage become

Figure 2 Ankle CT shows a LIFT lesion. Note that the articular surface of the OC fragment is facing its donor subchondral bone, being thus inverted in relation to its original position. LIFT, lateral inverted osteochondral fracture of the talus ; OC, osteochondral.

facing the talus donor site, being thus described as 'lateral inverted osteochondral fracture of the talus (LIFT) lesion' or inverted OC fracture of the talus.

The LIFT lesion is uncommon representing 2% of all operative osteochondral lesions. The most common treatment is diagnostic arthroscopy to access the fragment viability for fixation (good dimensions with enough amount of attached cancellous bone), followed by open reduction and internal fixation.¹

The objective of this paper is to describe a successful arthroscopic reduction and fixation of a LIFT lesion based on a case report.

CASE PRESENTATION

A 45-year-old man, without any relevant medical history, reported at the trauma emergency room after an inversion ankle sprain in the sequence of an ~1.5 m fall. He was unable to walk due to weight bearing-related pain. At exploration, we noted a severe bimalleolar oedema, with pain reported in all degrees of range of motion, without signs of lateral instability. There were also no signs of neurovascular compromise.

INVESTIGATIONS

The first assessment was an ankle plain X-ray which was initially interpreted as normal. However, since the patient had a severe swollen and painful ankle, we reviewed this initial observation and noted some articular irregularity on the lateral talus articular contour (figure 1). An ankle CT was then performed to rule out additional lesions. It showed an anterolateral

Figure 1 Ankle plain X-ray (mortise+lateral view) shows superolateral talus articular irregular contour.

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Figure 3 Anterior ankle arthroscopy images. (A) Big OC anterolateral fragment (LIFT lesion already flipped to its natural position). (B) Provisional OC fragment fixation with a percutaneous Kirschner wire. (C) Percutaneous headless screw insertion. (D) Final control with the fragment held in place by the screw. LIFT, lateral inverted osteochondral fracture of the talus; OC, osteochondral.

osteochondral fracture of the talus, but it was also noted that it had an important particularity because the OC fragment cartilage surface was facing the talar subchondral bone, being thus inverted in relation to its natural position (figure 2).

Therefore, we assumed the diagnosis of a LIFT lesion since it met the criteria established by Dunlap and Ferkel.

TREATMENT

We referred the patient to anterior ankle diagnostic arthroscopy to assess the conditions to fix or remove the fragment. We used the standard anteromedial and anterolateral portals. The procedure was performed under controlled ischaemia achieved by a thigh tourniquet with 300 mm Hg pressure according to service protocol.

During the procedure, we were able to confirm the presence of a multifragmentary anterolateral OC talar lesion, with a very large OC fragment with maximal diameter >1 cm. After some manipulation, with the aid of a grasper and a small hook, we were able to turn the fragment into its 'natural' position (figure 3A).

Since the fragment was big enough and had a significant amount of attached subchondral bone, we considered it viable for fixation. Due to its anterolateral position, we managed to reduce and fix it through anterior arthroscopy.

First, we reduced the fragment to its natural position, with the help of a small hook and fixed it provisionally with a percutaneous small Kirschner wire (figure 3B). After confirming that it was in a good position, we used a 3.0 mm titanium headless screw (FRS screw—Biomet) for final fixation (figure 3C). Then we confirmed the stability and reduction quality of the fixed fragment (figure 3D). The passive ankle range of motion was similar to the contralateral side at the end of the procedure.

A posterior below knee cast was applied with the ankle in neutral position.

Figure 4 Six-month follow-up ankle CT shows complete fragment consolidation in a good position with no signs of hardware failure or impingement.

OUTCOME AND FOLLOW-UP

The patient used a non-weight bearing cast for 3 weeks and then changed it for a walking boot with partial weight bearing, during three more weeks. After this 6-week period, the patient began passive and active ankle movement and was encouraged to start progressive weight-bearing walk at 8 weeks postoperatively.

The clinical progress was notable with the patient being able to walk without crutches at 10 weeks after surgery.

At 6 months, the control plain X-ray and ankle CT and MRI showed apparent consolidation of the fragment, without any signs of hardware failure or impingement. The patient was able to return to normal daily activities without any complaints (figure 4 and figure 5).

DISCUSSION

LIFT lesion definition was introduced by Dunlap and Ferkel in 2013, but the original trauma mechanism had already been described by Berndt and Harty in 1959.⁵ This is a rare event, with less than 20 cases reported in the literature.¹ As all OC lesions, early identification and subsequent treatment are key for success.^{1 2 4 5} The early diagnosis of this type of lesion is mainly based on a high level of clinical suspicion. Although it can be identified in plain X-ray, the suspicion of this injury must be followed by a complementary investigation with CT and/or MRI that can be useful both in the diagnosis and in the definition of the surgical strategy. CT allows to identify the inverted OC fragment while MRI may also be useful in identifying additional chondral and soft-tissue lesions (particularly lateral ligament complex lesions).¹

Figure 5 Six-month follow-up MRI shows acceptable articular contour and some metal artefacts due to the titanium alloy screw.

This patient was 45 years old which is an unusual age for a LIFT lesion as it tends to be more common in younger adults.

Even though LIFT is a rare lesion, the treatment options and goals are consensual in the literature. The primary goal is to assess the fragment fixation viability. This decision should be based on the fragment size, amount of subchondral bone attached to the fragment and lesion chronicity.^{1,2,4} Although the CT and MRI can help in identifying these factors, the current literature considers arthroscopic findings to be more accurate.^{1,2,4}

The majority of the cases described in the literature are suitable for fixation, and the open approach was the elected method in all cases.¹⁻⁶ Dunlap and Ferkel described how they were able to reduce the fragment to its anatomical position in some arthroscopies but could not fix them arthroscopically because of the fragment size and difficult location. In our case, we were able to fix the main OC fragment arthroscopically because it was anterior enough to be accessible for percutaneous fixation (figure 3). We decided to use a titanium implant which guarantees good fixation and biocompatibility.

Learning points

- ▶ Ankle sprains are common lesions but often hide important complex lesions.
- ▶ Disproportionate ankle pain and oedema should raise suspicion for the presence of a hidden lesion.
- ▶ Subtle articular line alterations in the plain ankle X-ray can represent important osteochondral (OC) lesions.
- ▶ Early identification and acute treatment of lateral inverted OC fracture of the talus lesions is one of the keys for a successful treatment.

Since we did not find any arthroscopic lesions in the lateral ligament complex, or any signs of instability during physical examination, no additional procedures were necessary.

Despite the major impact of the trauma mechanism, this case shows that a good outcome in the short and midterm can be expected if the lesion is diagnosed and treated in the acute phase. However, in the long term, these major trauma events are likely to produce ankle osteoarthritis changes.¹

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