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Case Report

Trimalleolar fracture and associated Achilles tendon rupture: Ten year follow up of an unusual water-skiing injury

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SUMMARY

A 49 year old professional fitness instructor sustained a high velocity rotational injury to his right ankle while waterski-ing. The ski bindings did not release, exacerbating the injury. This resulted in a trimalleolar fracture and a rupture of his Achilles tendon.

A trimalleolar fracture in association with a rupture of the Achilles tendon has not been previously reported.

This combination of injuries posed a dilemma in treatment options and postoperative management.

The authors felt that ensuring that the Achilles tendon healed with no shortening was the priority for future function in this professional athlete.

It was decided to treat the Achilles tendon rupture by open repair and to place the ankle in equinus postoperatively.

It was also decided to openly reduce and internally fix the medial and lateral malleolar fractures before immobilising the ankle in equinus.

Any residual stiffness in the ankle, subtalar and midtarsal joints would be treated with aggressive physiotherapy.

It was felt that the rotational forces may have resulted in a degree of degloving around the ankle. Care was therefore taken in the choice and placement of the surgical incisions.

In spite of this, the lateral surgical wound broke down postoperatively, needing treatment with a fasciocutaneous flap.

When reviewed at ten years following the injury, the patient was continuing to work as a fitness instructor with a view to continuing to retirement in five years at the age of 65.

There was a slight decrease in dorsiflexion of the right ankle but flexion was full and movement of the subtalar and midtarsal joints were also full.

There remained 1 cm of wasting of the right calf.

Radiology of the ankle showed no joint space narrowing or evidence of degenerative change at ten years following the injury.

Introduction

The combination of a tri-malleolar fracture and associated rupture of the Achilles tendon is unusual and has not previously been reported.

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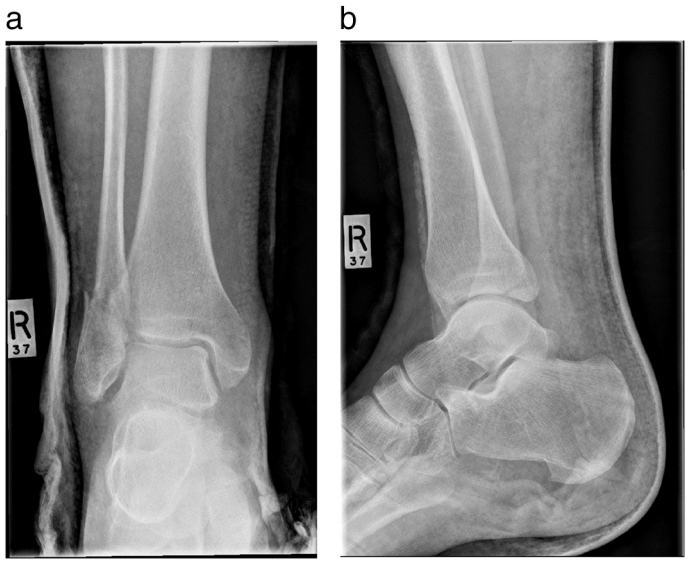

Fig. 1. a: Anteroposterior radiograph of the right ankle dated 5 August 2006 showing a trimalleolar fracture.
b: Lateral radiograph of the right ankle dated 5 August 2006 showing a trimalleolar fracture.

Ankle injuries involving a fracture of the medial malleolus and associated rupture of the Achilles tendon have been described [1–7].

In two instances, the rupture of the Achilles tendon was diagnosed but the medial malleolar fracture was initially missed [3,7].

In two instances, the medial malleolar fracture was diagnosed but the Achilles tendon rupture was initially missed [1,6].

Case report

A 49 year old fitness instructor sustained a high velocity twisting injury to his right ankle on 5th August 2006 while waterski-ing on a slalom ski. He was travelling at 30mph, although he reached 40 mph at the turns.

He said that he clipped a buoy, causing him to fall. The binding of the ski did not release and had to be unscrewed subsequently to free the patient's foot.

Clinically, there was bruising and swelling of the right ankle and a gap could be palpated in the Achilles tendon. The Simmonds test was positive. Dorsalis pedis and posterior tibial pulses were present and neurology was normal.

AP and lateral radiographs showed there to be a tri-malleolar fracture (Fig. 1a and b).

An MRI scan carried out on 9 August 2018 confirmed the trimalleolar fracture and demonstrated a rupture of the Achilles tendon together with a complete tear of the anterior tibio-fibular ligament and a partial tear of the anterior talo-fibular ligament. (Fig. 2a, b and c).

The foot was elevated to reduce the swelling.

Taking into account the patient's job as a professional fitness instructor, it was decided to carry out an open repair of the Achilles tendon to avoid any shortening. The ankle would have to be placed in equinus post-operatively and it was decided to openly reduce and internally fix the medial and lateral malleolar fractures to avoid their displacement. It was explained to the patient that there would be post-operative stiffness of the ankle and subtalar joints at the expense of restoring the correct length of the Achilles tendon.

On 18th August 2006, through a posterior incision medial to the Achilles tendon, the tendon was seen to be completely ruptured 2 cm proximal to its insertion into the calcaneum and was repaired with a Bunnell suture using “1” Ethibond.

Through a lateral incision over the lateral malleolus, the fibular fracture was reduced and held with an interfragmentary screw and a two third semitubular six hole plate.

Through a medial incision, the medial malleolus was reduced and held with a 45 mm cortical screw.

A backslab was applied with the foot in equinus.

Post-operative radiographs on 21 August 2006 showed that the fractures had been anatomically reduced (Fig. 3a and b).

After six days of elevation, the patient was discharged non weight bearing in an equinus cast.

The lateral wound subsequently broke down. The Plastic Surgeons carried out a distally based fasciocutaneous flap on 21 September 2006, that healed uneventfully.

When reviewed on 29 November 2006, he was fully weight bearing with 10° dorsiflexion and 20° plantarflexion of the right ankle.

He returned to work as a fitness instructor and continued with physiotherapy two or three times a week over the next year.

He complained of discomfort related to the fibular plate and the metalwork was removed on 23 February 2009 under general anaesthetic.

The patient was reviewed ten years after the injury, on 22 March 2017.