CASE REPORT

Muscular tendinous junction rupture of the posterior tibial tendon after closed bimalleolar ankle fracture

Salomon Jasqui-Remba,¹ Ruy Ernesto Rodriguez-Corlay²

¹Department of Orthopedics, American British Cowdray Medical Center, Mexico City, Estado de México, Tecamachalco, Mexico
²ABC Medical Center, Mexico, Mexico

Correspondence to
 Dr Salomon Jasqui-Remba,
 drsjasqui@gmail.com

Accepted 21 January 2016

SUMMARY

In this case report, we present an acute rupture in the muscular tendinous junction of a posterior tibialis muscle in a bimalleolar closed ankle fracture after a high-energy trauma in a 30-year-old patient with no significant medical history. Fracture was confirmed by simple X-rays, and was treated with an open reduction in which both of the fractures were treated with osteosynthesis material and reparation of the syndesmosis. If left untreated, this uncommon finding can result in a bad postsurgical outcome; we believe this injury is more common but under-reported in the literature. The surgeon should be aware and look specifically for this type of lesion during the procedure. Finding and treating this injury requires special postoperative care, non-weight-bearing instructions and balanced physiotherapy.

BACKGROUND

Rupture of the posterior tibial tendon is an uncommon clinical condition,¹ and even more uncommon in the presence of a closed bimalleolar ankle fracture.² Only a few cases have been reported previously, with different injury mechanisms, and with the ruptures occurring at different anatomical sites of the tendon.^{1,3} Rupture in the muscular tendinous junction has been reported only once.⁴

The pain associated with the injury limits the clinical examination, making it difficult to diagnose the injury.³ This uncommon finding may be the reason for a bad postsurgical outcome such as pes planus, persistent pain or weakness; we believe this injury is more common than reported in the literature. The surgeon should be aware and evaluate specifically for this type of lesion whenever a high-energy mechanism of injury is present, evaluating intraoperatively and fluoroscopically all tendinous structures and ligaments. In the case of posterior tibial tendon repair, balanced physiotherapy with an emphasis on Posterior Tibialis (PT) muscle-tendon unit use is of great importance.

CASE PRESENTATION

A 30-year-old man with no medical history presented to the emergency department after sustaining an injury to his right ankle following a motorcycle accident. On initial clinical evaluation, he had deformity, oedema and local ecchymosis without evidence of an open or neurovascular injury. The patient was immobilised with a suropodalic splint.

The initial radiographs demonstrated a bimalleolar, Weber C, AO 44C2.2 and a subluxation of the talus (figure 1).

Figure 1 Simple anteroposterior and lateral ankle X-rays showing the bimalleolar fracture, Weber C, AO 44C2.2 and a subluxation of the talus.

After careful intraoperative evaluation of the medial perimalleolar soft tissue, medial instability was found with fluoroscopic analysis; all tendinous structures and ligaments were evaluated and medial ligament revision was performed finding a rupture of the tibialis posterior tendon in the muscular tendinous junction (figure 2).

TREATMENT

The patient was prepared for open reduction in the operating room; medial and lateral approaches were used. For the fixation of the medial malleolus, two lag screws were used and for the fibula fracture a bridging plate in conjunction with a fibulotibial positioning screw was used (figure 3). For the rupture of the tibialis posterior tendon in the

Figure 2 Transoperative posterior tibialis tendon rupture.

CrossMark

To cite: Jasqui-Remba S, Rodriguez-Corlay RE. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-214028

Figure 3 Simple anteroposterior ankle postoperative X-rays.

muscular tendinous juncture, a modified Kessler terminoterminal repair was used.

OUTCOME AND FOLLOW-UP

The patient was discharged the day after the surgery, with instructions to be non-weight-bearing and fitted with a suropodalic splint. The fibulotibial positioning screw was removed 8 weeks later, uneventfully, followed by balanced physiotherapy with emphasis on posterior tibial muscle-tendon recruitment for 10 sessions over a 1 month period; with a successful evolution, the patient was discharged 6 months later.

DISCUSSION

The disruption of the posterior tibialis tendon is an uncommon injury, more frequently found in open injuries and direct laceration. It is associated with rheumatoid arthritis and non-specific tenosynovitis when it happens spontaneously.^{1 2} Few cases of closed ankle fractures with posterior tibial tendon rupture have been reported in the literature.^{3 5} It has been reported only once at a rupture of the muscular tendinous junction.⁴

Anatomically, the posterior tibialis tendon has a less vascularised zone when it passes posterior to the medial malleolus, becoming a frequent site of rupture.³ In our case, the rupture

presented in the muscular tendinous junction, reported only by Uzel *et al*⁴ in three different cases.

The injury mechanism was associated with a medial malleolus fracture, a laterally displaced talus and, in 80% of the cases, with a supra syndesmotic fracture with a pronation-external rotation mechanism. The site of the rupture most commonly occurred 2 cm above the site of the fracture.⁶

The disruption of the tendon is easily unnoticed because of the proximal retraction after the rupture. The rupture is often recognised only after the open procedure is performed; this is why, whenever a high-energy mechanism of injury is present, the surgeon should be aware of intraoperatively and fluoroscopically evaluating all tendinous structures and ligaments. Misdiagnosis and non-treatment of the injury may lead in the short-long term to medial instability, pes planus, as well as a chronic posterior tibialis tendon dysfunction.⁶

Irreducible cases of acute ankle fractures have been reported, associated with the interposition of the tibialis posterior tendon, broken or not, in the medial malleolus fracture or between the medial and lateral fracture.^{7 8}

It is important whenever these lesions are found to give non-weight-bearing instructions and balanced physiotherapy.

Learning points

- ▶ Misdiagnosis of an acute posterior tibial tendon can lead to catastrophic consequences in the natural mechanics of the foot.
- ▶ Flat foot, chronic instability and posterior tibial tendon dysfunction are common complications.
- ▶ Severe soft tissue damage on the medial side of the ankle, as well as a supra syndesmotic fibula fracture, medial malleolus fracture and a laterally displaced talus, should encourage the surgeon to evaluate the posterior tibial tendon in order to rule out a rupture.
- ▶ Whenever these lesions are found, non-weight-bearing instructions and balanced physiotherapy are indicated.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Anzell SH, Covey KW, Weiner AD, *et al*. Disruption of muscles and tendons; an analysis of 1,014 cases. *Surgery* 1959;45:406–14.
- 2 Kelbel M, Jardon OM. Rupture of tibialis posterior tendon in a closed ankle fracture. *J Trauma* 1982;22:1026–7.
- 3 West MA, Sangani C, Toh E. Tibialis posterior tendon rupture associated with a closed medial malleolar fracture: a case report and review of the literature. *J Foot Ankle Surg* 2010;49:565.e9–12.
- 4 Uzel AP, Massicot R, Delattre O, *et al*. [Traumatic rupture of the tibialis posterior tendon after ankle fractures: three cases and a review of the literature]. *Rev Chir Orthop Reparatrice Appar Mot* 2006;92:283–9.
- 5 Ceccarelli F, Faldini C, Pagkrati S, *et al*. Rupture of the tibialis posterior tendon in a closed ankle fracture: a case report. *Chir Organi Mov* 2008;91:167–70.
- 6 Bos M, Lusskin R. Acute disruption of the posterior tibial tendon associated with open-fracture dislocation of the ankle. *Foot Ankle Int* 1997;18:823–6.
- 7 Korovessis P, Spastris P, Katsardis T, *et al*. Simultaneous rupture of the tibialis posterior and flexor digitorum longus tendons in a closed tibial fracture. *J Orthop Trauma* 1991;5:89–92.
- 8 Ermis MN, Yagmurlu MF, Kilinc AS, *et al*. Irreducible fracture dislocation of the ankle caused by tibialis posterior tendon interposition. *J Foot Ankle Surg* 2010;49:166–71.

Copyright 2016 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow