CASE REPORT

Dislocated ankle fracture complicated by near total distal ischaemia

Fatih Duygun, Omer Sertkaya, Cengiz Aldemir, Ali Dogan

Department of Orthopaedics and Traumatology, Antalya Education and Research Hospital, Antalya, Turkey

Correspondence to

Dr Fatih Duygun,
fduygun2000@yahoo.com

SUMMARY

Total arterial ischaemia is rarely seen following a dislocated ankle fracture but if it does and intervention is not made, it can lead to serious morbidity. We present a 39-year-old woman with almost total occlusion in the arteria tibialis and arteria dorsalis pedis following a dislocated ankle fracture as a result of a bicycle fall.

BACKGROUND

Ankle fracture dislocations are a frequently encountered problem in daily orthopaedic practice. However, the development of blockage in the arteries feeding the foot and insufficient circulation in the foot is a rarely seen event.

CASE PRESENTATION

A 39-year-old female patient was referred to our hospital emergency department from an external centre with pain, swelling and deformity in the left ankle following a fall from a bicycle. At the external centre, reduction had not been made but a splint had been applied and 2.5 h later the patient was brought to our hospital. The patient history revealed that apart from D-thyroxin given following goitre surgery at the age of 17, no other medication was in use. The patient had undergone three caesarean section births. There was no history of any other diseases (figures 1 and 2).

In the physical examination made in the emergency department, it was determined that there was deformity in the ankle. The dislocation of the ankle was reduced. In the examination made after reduction, there was distal capillary circulation but the distal pulse could not be taken. The vascular surgeon was consulted and the patient was immediately admitted for surgery. Fixation with plate and screw was applied to the lateral malleolar fracture and two interfragmentary screws were used for the posteromedial fracture. Checking was made under fluoroscopy and there was not seen to be any problem as there was capillary circulation in the foot but the distal foot was cold and the pulse could not be taken from the dorsalis pedis. The vascular surgeon was consulted and an emergency angiograph was applied. In the angiograph it was observed that there was total blockage in the dorsalis pedis and almost total blockage in the arteria tibialis posterior but collateral flow was seen from the proximal (figure 3). Therefore, working together with the vascular surgeon, exploration was made of the arteria tibialis posterior and the dorsalis pedis. During the exploration, the integrity of the arteria tibialis posterior was seen to be intact

Figure 1 Preoperative anteroposterior and lateral radiographs.

but there was a blockage. A segment of approximately 1 cm, which was damaged and blocked, was excised and end-to-end anastomosis was applied. The arteria dorsalis pedis was then explored and again was seen to have anatomical integrity but no free flow was observed. The thrombus was removed through a Fogarty catheter and the repair was made. In both arteries, there was seen to be distal circulation and the circulation in the foot was seen to have been corrected.

TREATMENT

Internal fixation with plate and screw was applied to the dislocated fracture and both the damaged arteries were repaired.

OUTCOME AND FOLLOW-UP

The patient was hospitalised for 10 days with routine follow-up of circulation. There were no postoperative complications. The sutures were removed on postoperative day 15. The splint was removed on day 45 and movements were

CrossMark

To cite: Duygun F, Sertkaya O, Aldemir C, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-201390

Figure 2 Postoperative anteroposterior and lateral radiographs.

started. There were no problems throughout the subsequent follow-up.

DISCUSSION

Although popliteal artery damage has been reported at a high rate following knee dislocation,¹ arterial damage following ankle dislocation is rarely seen. Tremain *et al*¹ applied arteriography to 115 cases of knee dislocation and popliteal artery damage was determined in 27 cases (23%). There are many other reports of popliteal artery damage following knee dislocation.²⁻⁴ However, to the best of our knowledge there are no such studies following dislocated ankle fracture. It is therefore difficult to know the incidence.

In these kinds of patients where there is initially no pulse, reduction should be made and when checked again after reduction, if there is still no pulse, arteriography should be applied.² In the case presented here, the ankle was dislocated on arrival at the emergency department and the distal pulse could not be taken. The ankle was reduced. As circulation had not improved, the patient was taken to the operating room and fixation was made as primary intervention for the fracture. Despite fixation of the fracture, as there was still no correction of the circulation, angiography was applied. Arterial blockage was determined on the angiography and the arterial occlusion was removed by the vascular surgeon.

Figure 3 In the angiography taken after fracture fixation total blockage is seen in the arteria dorsalis pedis and almost total blockage in the arteria tibialis posterior.

Learning points

- ▶ Even though it is a rare development, care is required in respect of arterial ischaemia following a dislocated ankle fracture.
- ▶ For these kinds of patients there should be preoperative and early postoperative period follow-up in the form of simple physical examinations.
- ▶ When there is any doubt, the vascular surgeon must certainly be consulted and if necessary, arteriography should be applied.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Treiman GS, Yellin AE, Weaver FA, *et al.* Examination of the patient with a knee dislocation. The case for selective arteriography. *Arch Surg* 1992;127:1056–62; discussion 1062–3.
- 2 Bonneville P, Chaufour X, Loustau O, *et al.* [Traumatic knee dislocation with popliteal vascular disruption: retrospective study of 14 cases]. *Rev Chir Orthop Reparatrice Appar Mot* 2006;92:768–77.
- 3 Green NE, Allen BL. Vascular injuries associated with dislocation of the knee. *J Bone Joint Surg Am* 1977;59:236–9.
- 4 Kaufman SL, Martin LG. Arterial injuries associated with complete dislocation of the knee. *Radiology* 1992;184:153–5.

Contributors All the authors contributed to intellectual concept of this manuscript.

Copyright 2013 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