CASE REPORT

Symptomatic anterior subtalar arthrosis after ankle arthrodesis

Tun Hing Lui

Department of Orthopaedics
and Traumatology, North
District Hospital, Hong Kong,
Hong Kong

Correspondence to

Dr Tun Hing Lui,
luithderek@yahoo.co.uk

Accepted 17 April 2014

SUMMARY

A 76-year-old man reported right lateral heel pain 11 years after ankle arthrodesis. Clinically, there was tenderness in the right sinus tarsi and over the junction point between the talonavicular and calcaneocuboid joints. Radiographs showed that the joint spaces of the posterior subtalar joint and the talonavicular joint were preserved although there were osteophytes at both joints. Arthroscopic findings showed degeneration of the anterior subtalar and talonavicular joints. The symptoms subsided after arthroscopic debridement.

BACKGROUND

Ankle arthrodesis is commonly performed in patients with end-stage osteoarthritis of the ankle.^{1 2} In the intermediate to long-term following an arthrodesis for the treatment of end-stage ankle arthritis, pain is reliably relieved and there is good patient satisfaction.^{3 4} However, there are persistent alterations in gait with the progressive development of ipsilateral midfoot and hindfoot arthritis.⁴⁻⁷ Degenerative change of the posterior subtalar joint is most commonly seen in patients following ankle fusion.^{1 2 8} Degenerative change is less commonly found in the talonavicular joint and only rarely

seen in the calcaneocuboid joint.⁸ The patient shall report the foot pain particularly over the posterior subtalar joint.^{3 4 6 9} We reported a case of symptomatic anterior subtalar osteoarthritis following ankle arthrodesis without significant degenerative changes of the posterior subtalar joint. The patient was successfully treated arthroscopically.

CASE PRESENTATION

A 76-year-old retired policeman had bilateral ankle arthrodesis in 2000 for ankle osteoarthritis. He was asymptomatic for 11 years and enjoyed hiking before he had right lateral heel pain on walking. The condition was deteriorating and affecting his hobby of hiking. Clinically, there was tenderness in the right sinus tarsi and over the junction point between the talonavicular and calcaneocuboid joints. There was no pain or tenderness over the midtarsal joint.

INVESTIGATIONS

Radiographs showed that the joint spaces of the posterior subtalar joint and the talonavicular joint were preserved although there were osteophytes at both joints (figure 1).

Figure 1 (A and B) Preoperative radiographs of the patient's right ankle showing varus osteoarthritis with multiple osseous loose bodies. (C and D) Radiographs showing solid fusion of the ankles with degenerative changes of the posterior subtalar and talonavicular joints.

To cite: Lui TH. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-203514

Figure 2 Intraoperative photos. (A) Posterior subtalar arthroscopy with anterolateral and middle subtalar portals. (B) Anterior subtalar arthroscopy with anterolateral subtalar portal and dorsolateral mid-tarsal portal (located at the junction point between the talonavicular and calcaneocuboid joints).

TREATMENT

The pain did not relieve by insole. Right anterior^{10 11} and posterior subtalar arthroscopy was performed (figure 2). Intraoperatively, the cartilage of the posterior subtalar joint was found to be intact. There was fibrosis at the sinus tarsi without any significant synovitis. The articular cartilage of the plantar surface of the talar head and the sustentaculum tali was all gone with exposure of the subchondral bone. There was patchy loss of articular cartilage of the lateral part of the talar head (figure 3). The anterior subtalar joint was surrounded by inflamed synovium. Arthroscopic synovectomy was performed.

OUTCOME AND FOLLOW-UP

The heel pain subsided after the operation. Even at 26 months after the operation, the pain did not recur and he enjoyed hiking again.

DISCUSSION

Several long-term studies of ankle arthrodesis note an increased incidence of radiographic evidence of ipsilateral arthritis of the hindfoot and midfoot.^{1 3–8} These degenerative changes are believed to be due to altered biomechanics following compensatory increase in movement of the surrounding joints of the foot to compensate for loss of ankle motion.^{4 6 8} The restricted ankle motion resulted in decreased forward progression of the tibia, causing early heel-rise and increased ground-reaction forces to the midtarsal joints.^{4 12 13} The total force transmitted through the subtalar joint as well as the contact pressure also increased.¹⁴ Hypermobility of the subtalar and medial column joints is then developed. The significantly increased subtalar range of movement appeared to cause impingement of the posterior part of the posterior facet of the subtalar joint which may account for the increased incidence of subtalar arthritis following arthrodesis.¹⁵ On the other hand, it is also possible that, in some cases, the biomechanics are altered before arthrodesis either as a direct result of the developing arthritis in the ankle

or secondary to the pathology which caused degeneration of the ankle joint.^{3 5} Prolonged immobilisation following ankle arthrodesis can also be implicated in the aetiology of the degeneration seen in ipsilateral foot joints.⁶ No matter the reason of development of subtalar and midtarsal arthritis, it is well-known that the radiographic changes are common following ankle arthrodesis. However, many of them are not symptomatic until the arthritic changes are very much advanced. This patient presented with heel pain 11 years after ankle arthrodesis and any association with the onset of radiographic changes can be a result of chance. This is supported by the fact that the radiographic changes of the subtalar and talonavicular joints were mild. The arthritic changes of the anterior subtalar joint may be secondary to the pathology which caused degeneration of the

Figure 3 Arthroscopic views showing that the cartilage of the posterior subtalar joint was intact. The articular cartilage of the plantar surface of the talar head and the sustentaculum tali were all gone with exposure of the subchondral bone. There was patchy loss of articular cartilage of the lateral part of the talar head.

ankle joint instead of a result of altered biomechanics following ankle arthrodesis.

Conversion to total ankle arthroplasty and subtalar fusion has been proposed as the treatment of painful subtalar arthrosis with a fused ankle.¹⁶ It is a major operation with substantial potential complications and usually not justified by the severity of symptoms.^{3,8} Arthroscopy can provide an interim alternative treatment. Lesions associated with arthritis, such as synovitis, impinging osteophytes and loose bodies, can be treated effectively with arthroscopy. Arthroscopic debridement does not offer a cure but may alleviate the symptoms of degenerative arthritis and delay the need for a major operation.¹⁷ The key for success of arthroscopic debridement is to identify the causative joint accurately. Although the posterior subtalar joint is the most commonly degenerated joint seen on radiograph following ankle arthrodesis, it may not be symptomatic. The anterior subtalar joint is difficult to be assessed in standard radiographs of the foot and is frequently neglected. Careful examination of the location of tender spot is the key to detect problem of this joint. Anterior subtalar pathology usually presents with sinus tarsi pain and sometimes medial heel pain around the sustentaculum tali. Tenderness can be elicited by deep palpation of the soft spot between the talonavicular and calcaneocuboid joints and pointing posteromedially.¹⁸ The anterior subtalar joint and the talonavicular joint share the same synovial lining and capsule and they work together functionally. This explained why the anterior subtalar and talonavicular joints had similar degree of degeneration in this case. Therefore, degeneration of the anterior subtalar joint should be suspected if there is radiographic evidence of talonavicular arthritis.

Learning points

- ▶ Anterior subtalar joint can be the source of hindfoot pain following ankle arthrodesis.
- ▶ Clinical examination of the location of tender spot is the key to detect problem of this joint.
- ▶ Anterior subtalar arthroscopy is a useful tool to investigate and treat the pathology of this joint.

Contributors THL is responsible for all aspect of preparation of this manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Narayana G, Kumar M. Outcome of ankle arthrodesis in posttraumatic arthritis. *Ind J Orthop* 2012;46:317–20.
- 2 Strasser NL, Turner NS. Functional outcomes after ankle arthrodesis in elderly patients. *Foot Ankle Int* 2012;33:699–703.
- 3 Buchner M, Sabo D. Ankle fusion attributable to posttraumatic arthrosis: a long-term followup of 48 patients. *Clin Orthop Rel Res* 2003;406:155–64.
- 4 Thomas R, Daniels TR, Parker K. Gait analysis and functional outcomes following ankle arthrodesis for isolated ankle arthritis. *J Bone Joint Surg Am* 2006;88:526–35.
- 5 Sheridan BD, Robinson DE, Hubble MJ, et al. Ankle arthrodesis and its relationship to ipsilateral arthritis of the hind- and mid-foot. *J Bone Joint Surg Br* 2006;88:206–7.
- 6 Coester LM, Saltzman CL, Leupold J, et al. Long-term results following ankle arthrodesis for post-traumatic arthritis. *J Bone Joint Surg Am* 2001;83A:219–28.
- 7 Hendrickx RP, Stufkens SA, De Bruijn EE, et al. Medium- to long-term outcome of ankle arthrodesis. *Foot Ankle Int* 2011;32:940–7.
- 8 Winson IG, Robinson DE, Allen PE. Arthroscopic ankle arthrodesis. *J Bone Joint Surg Br* 2005;87B:343–7.
- 9 Fuentes-Sanz A, Moya-Angeler J, Lopez-Oliva F, et al. Clinical outcome and gait analysis of ankle arthrodesis. *Foot Ankle Int* 2012;33:819–27.
- 10 Lui TH, Chan KB, Chan LK. Portal safety and efficacy of anterior subtalar arthroscopy: a cadaveric study. *Knee Surg Sports Traumatol Arthrosc* 2010;18:233–7.
- 11 Lui TH. Clinical tips: anterior subtalar (talocalcaneonavicular) arthroscopy. *Foot Ankle Int* 2008;29:94–6.
- 12 Jung HG, Parks BG, Nguyen A, et al. Effect of tibiotalar joint arthrodesis on adjacent tarsal joint pressure in a cadaver model. *Foot Ankle Int* 2007;28:103–8.
- 13 Beyaert C, Sirveaux F, Paysant J, et al. The effect of tibio-talar arthrodesis on foot kinematics and ground reaction force progression during walking. *Gait Posture* 2004;20:84–91.
- 14 Wang CL, Cheng CK, Chen CW, et al. Contact areas and pressure distributions in the subtalar joint. *J Biomech* 1995;28:269–79.
- 15 Sealey RJ, Myerson MS, Molloy A, et al. Sagittal plane motion of the hindfoot following ankle arthrodesis: a prospective analysis. *Foot Ankle Int* 2009;30:187–96.
- 16 Greisberg J, Assal M, Flueckiger G, et al. Takedown of ankle fusion and conversion to total ankle replacement. *Clin Orthop Rel Res* 2004;424:80–8.
- 17 Cheng JC, Ferkel RD. The role of arthroscopy in ankle and subtalar degenerative joint disease. *Clin Orthop Rel Res* 1998;349:65–72.
- 18 Lui TH, Chan KB. Arthroscopic management of late complications of calcaneal fractures. *Knee Surg Sports Traumatol Arthrosc* 2013;21:1293–9.

Copyright 2014 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