CASE REPORT

Avulsion fracture of peroneus longus at the first metatarsal insertion: a case report

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Reports of isolated avulsion fracture at the planter lateral base of the first metatarsal without injury of the tarsometatarsal joint are very rare. A 24 year old man sustained an avulsion fracture at the planter lateral base of the first metatarsal. Normal alignment of metatarsal bones and tarsometatarsal joint was maintained. In this paper, we describe internal fixation of the displaced fragment using x ray and minimally invasive surgery with good results.

Many papers have reported first metatarsal fracture with accompanying injury of the tarsometatarsal joint,¹⁻⁴ but reports of isolated avulsion fracture at the planter lateral base of the first metatarsal without injury of the tarsometatarsal joint are very rare.⁵⁻⁶ Similar to general avulsion fracture, this type of injury is caused by the strong tension exerted by the peroneus longus tendon. Previous surgical reports indicate excision or open reduction for fixation and confirmation of an intact tarsometatarsal joint. In this paper, we describe internal fixation using x ray and minimally invasive surgery with good results.

CASE REPORTS

During a rugby match, a 24 year old man fell on his knees in a toe out position, and another player stepped on the planter lateral side of his right foot towards the dorsal medial side. The subject heard a cracking sound and was unable to continue playing. He consulted our clinic regarding his foot 2 days later. The planter area presented with swelling, bleeding, and pain along the first metatarsal. He had pain on walking and at eversion or planter flexion of the ankle.

Radiography and computed tomography showed an avulsion fracture at the planter lateral base of the first metatarsal which displaced plantarlaterally by about 10 mm while normal alignment of the metatarsal bones and tarsometatarsal joint was maintained (fig 1).

Internal fixation was performed under x ray control 10 days after injury. Preoperatively, no pathologic laxity at the tarsometatarsal joint was indicated by stress x ray imaging under lumbar anaesthesia. Just below the fracture lesion, a 2.5 cm skin incision was made along the planter crease. Though we could not directly observe the avulsion fragment, retracting the planter aponeurosis, inner muscle, and other soft tissue by forceps caused reduction of the displaced fragment to an acceptable position. The fragment was then fixed firmly using a 30 mm cannulated cortical screw with a washer (fig 2).

Postoperatively, the patient was immediately allowed to walk with a heel touch gait, with partial weight bearing after 2 weeks, and full weight bearing after 3 weeks. There were no neurovascular symptoms. At 4 month follow up, the patient had no difficulty with daily living activities, working as clerk, or undertaking light exercise such as jogging.

Radiography and computed tomography of the right foot showed no displacement of the fracture fragment and bone union at proximal lesion.

Figure 1 (A) Left: Anteroposterior radiograph of the right foot demonstrating normal alignment of each metatarsal bone and tarsometatarsal joint. The fracture fragment was unclear. Right: Medial oblique radiograph of the right foot also demonstrating normal alignment. Outline indicates plantarlaterally displaced fracture fragment. (B) Direct coronal section clearly showing fragment plantarlaterally displaced by about 10 mm.

Figure 2 (A) Left: Postoperative anteroposterior radiograph of the right foot is similar to the preoperative radiograph except for the screw. Right: Postoperative medial oblique radiograph of the right foot. Reduction was incomplete but the fragment was fixed firmly by a cannulated cortical screw with a washer. (B) Postoperative direct coronal section indicated the fragment distance was reduced.

DISCUSSION

As described in Myerson's classification of the tarsometatarsal joint, partial incongruity-medial dislocation (type B-1) or divergent injuries (type C)¹ are often accompanied by avulsion fracture visible as a fleck.^{1,2} However, only three cases of isolated avulsion fracture at the plantar lateral base of the first metatarsal have been previously reported.^{5,6} According to the patient's account of his foot being stepped on on the plantar lateral side toward the dorsal medial side, it is conceivable that his ankle was dorsiflexed and strongly inverted. Therefore, this injury was caused by strong tension

Take home message

Following isolated avulsion fracture at the plantar lateral base of the first metatarsal, internal fixation using x ray and minimally invasive surgery provided good results.

exerted by the peroneus longus tendon similar to that in a previously report.⁶

Since radiography and computed tomography showed normal alignment of the metatarsal bones and no laterality of the tarsometatarsal joint, and stress x ray imaging demonstrated no laxity of the tarsometatarsal joint,⁷ we evaluated the ligaments and articular surface around the first metatarsal and cuneiform as being intact similar to previous reports.^{5,6} Kwak and Bae described an intact tarsometatarsal joint capsular ligament investigated by open surgery, where the fracture fragment was reduced and pinned with Kirschner wires.⁶ However, we operated under x ray control without invasive exposure of the tarsometatarsal joint. Although we could not observe the lesion or minimise anatomical reduction, we obtained firm fixation and bone union of the fragment at the proximal lesion. As Hodor *et al* described for bone union after 4 mm displacement,⁵ we considered complete reduction unnecessary if firm fixation and partial bone contact are obtained for early weight bearing and social rehabilitation. We also considered that using forceps to gently retract the plantar muscle and other soft tissue would avoid neurovascular injury.

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