

Stress Fracture of the Body of the Talus in Athletes Demonstrated with Computer Tomography

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Abstract:

Purpose: This article describes a series of four previously unreported stress fractures of the body of the talus.

Case summary: The four patients presented with ankle pain of gradual onset for periods of three weeks to 12 months. Radioisotope scans in all four patients showed identical pictures of markedly increased uptake in the region of the body of the talus. Computed tomographic scan images were also similar showing a distinct fracture line through the posterolateral aspect of the body of the talus extending into the subtalar joint. All four patients were treated differently ranging from rest to surgery, but no treatment appears totally successful.

Discussion: A single case of stress fracture of the neck

of talus has previously been reported in a runner, but no previous cases of stress fracture of the body of the talus have been reported. The mechanism may be that in the presence of excessive subtalar pronation and plantar-flexion, the lateral process of the calcaneus impinges on the concave posterolateral corner of the talus. No treatment appeared totally successful but the authors would recommend a six week period of non-weight-bearing rest.

Relevance: The diagnosis of stress fracture of the body of the talus should be considered in the athlete who presents with gradual onset of ankle pain.

Key Words: Stress fractures—Talus—Athletics.

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Stress fracture of the body of the talus has to our knowledge not been reported previously, although reports of talar neck stress fractures have been published (1,4,5,7,8).

The clinical features of tarsal neck stress fractures are similar to those cases of tarsal body stress fractures reported herein. The two types of talar stress fractures, however, have differing radioisotope scan appearances. Four cases of this rare type of vertical lateral talar body fracture are presented, all of which would appear to be due to repeated stress rather than to acute injury.

CASE REPORTS

Case 1

A 30-year-old Australian Rules footballer presented with a 12-month history of left ankle pain with an increase in discomfort after increasing his training load. Radioisotope scan (Fig. 1) was reported as showing inflammation of the subtalar joint, but review of the scans revealed an area of increased uptake in the body of the talus. A computed tomography (CT) scan revealed a stress frac-

ture extending 5 mm in the coronal and 5 mm in the transverse plane through the posterolateral aspect of the body of the talus (Figs. 2 and 3). The fracture extended into the subtalar joint. The patient decided against the suggested treatment of 6 weeks non-weight-bearing cast immobilization and subsequently continued playing with significant discomfort. Biomechanical examination showed him to have excessive pronation at the subtalar joint, and he was fitted with an orthotic device. After a period of 6 months of limited activity, his symptoms improved. However, 2 years later he is still unable to run at top pace without considerable discomfort.

Case 2

A 37-year-old triathlete presented with a long history of left-sided groin pain and an insidious onset of right ankle pain over a period of 4-6 weeks. The ankle pain was localized to the lateral aspect of the ankle. On examination, there was tenderness along the subtalar joint margins, maximally at the opening to the sinus tarsi. He had been previously diagnosed on plain x-ray films as having a stress fracture of the distal fibula and had been prescribed 6 weeks of weight-bearing rest. However, his symptoms did not resolve over this time and a radioisotope bone scan was performed. This showed an increase in uptake over the posterolateral aspect of the talus. A subsequent CT scan showed a stress fracture ex-

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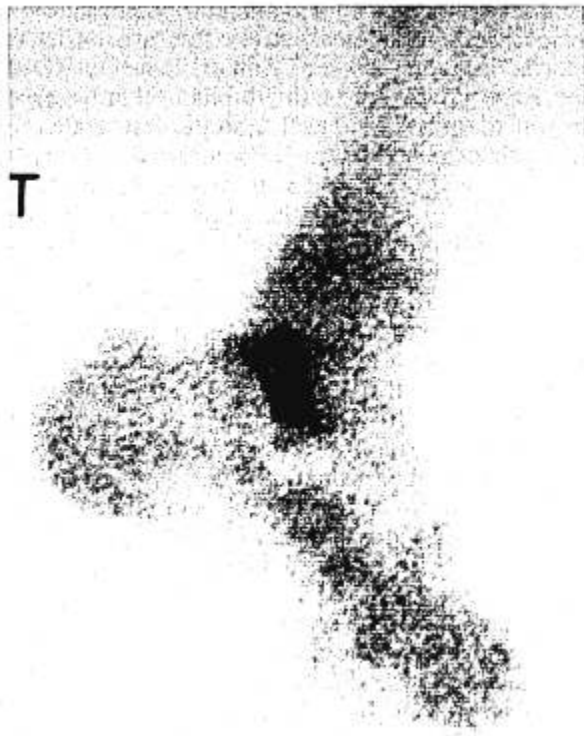


FIG. 1. Stress fracture of the talus shown as intense focal uptake on technetium bone scan.

tending 2–3 mm in the posterolateral talus, about midway between the lateral and posterior processes. This was associated with a great deal of sclerosis, and so it was decided to continue with a further period of weight-bearing rest. He returned slowly to running; however, subsequent CT scan showed slight extension of the fracture line.

Case 3

A 30-year-old pole vaulter was running repetitive 300-m sprints on a rubberized bitumen track when he felt something “give” on the lateral side of his left ankle. He had previously been sore in this region for 3 weeks. He was unable to run or jog afterward and was initially treated with antiinflammatory medication and ice. Three weeks later his condition had not improved. He felt tenderness over the sinus tarsi and had pain on forced passive eversion. His condition was diagnosed as sinus tarsi syndrome, and his sinus tarsi was injected with local anesthetic and corticosteroid. He improved symptomatically after the injection with local anesthetic, but was unable to return to running without pain.

A radioisotope scan was performed, which showed an increased uptake in the posterolateral talus. A CT scan showed a stress fracture extending 1.5 mm in the coronal and 6 mm in the transverse plane in the posterolateral corner of the talus.

He was treated in a non-weight-bearing cast for 3 weeks, but pain persisted. He was referred to an

orthopedic surgeon and subsequently underwent surgery. The sinus tarsi was explored and the fracture drilled. He was then immobilized for a further 6 weeks. The patient returned to sport 12 months after the surgery, but not to his previous level of achievement. Biomechanical assessment showed this patient to have bilateral excessive subtalar pronation.

Case 4

A 35-year-old general practitioner, who enjoyed social basketball and jogging, presented with an insidious onset of right ankle pain over a period of 6–8 weeks. The pain was poorly localized to the posterolateral aspect of the ankle and was aggravated by exercise. On examination he was noted to have local tenderness over the lateral aspect of the subtalar joint, including the opening of the sinus tarsi. He was treated conservatively with rest and physical therapy, but his symptoms became progressively worse.



FIG. 2. Stress fracture of the talus (arrowheads). Computed tomography scan, coronal plane.



FIG. 3. Stress fracture of the talus (arrowheads). Computed tomography scan, transverse plane.

A radioisotope bone scan was then performed. This showed an increase in uptake over the posterolateral aspect of the talus. A CT scan was subsequently performed and demonstrated a distinct fracture extending 4 mm in the coronal plane and 9 mm long in the transverse plane in the posterolateral corner of the talus. He was treated for 6 weeks in a non-weight-bearing cast. On removal of the cast, he had persistent pain and had a further 3 weeks of non-weight-bearing on crutches. Eighteen months later, he had no pain on walking, but was unable to run without pain.

DISCUSSION

This article discusses four cases of stress fracture of the posterolateral aspect of the talus, a stress fracture that has previously not been reported in the literature.

Stress fractures of the neck of the talus have been reported primarily in military recruits (4,5,7,8,10). One of the cases involving a military recruit was

associated with a calcaneonavicular coalition (7). A single case of talar neck stress fracture has been reported in a long distance runner. Doury et al. (2) reported a military recruit with bilateral stress fractures of the talus. The radioisotope scan shown in their article appears similar to the cases we have presented, and their patient may have had a stress fracture of the body of the talus, although they failed to differentiate it from previously reported talar neck fractures.

Acute fractures of the lateral process of the talus are not uncommon. They are thought to occur with the foot dorsiflexed and inverted, with the calcaneus causing shearing of the lateral process (3,6,9). We postulate that the mechanism of development of the talar stress fracture is that in the presence of excessive subtalar pronation and plantar flexion, the lateral process of the calcaneus impinges on the concave posterolateral corner of the talus. All four patients presented here had bilateral excessive subtalar pronation.

All cases presented as a severe sinus tarsi syndrome, and two of the cases were initially treated with injection of the sinus tarsi with local anesthetic and corticosteroid. In both cases, complete resolution of symptoms occurred with local anesthetic injection, but this effect was temporary.

Plain radiographs did not demonstrate the fracture in any of the cases. An isotope bone scan was performed initially to determine if the cause of the patient's pain was soft tissue or bony. An alternative approach would be to proceed directly to CT scan.

The radioisotope bone scan in all cases was identical and showed a typical distinctive pattern of increased uptake in which the "hot" talus is contrasted against the convex "cold" posterolateral process of the calcaneus. No previous CT of this fracture has been published. The CT appearances were very similar in all four cases.

This stress fracture extends into the subtalar joint, which probably explains why the condition was originally mistaken for sinus tarsi syndrome and possibly explains the poor treatment outcome.

For various reasons, the four athletes had different forms of treatment. None of the athletes has made a completely satisfactory recovery in that they were unable to return to their previous level of activity or they had persistent pain with activity.

Despite a small number of cases, the authors would recommend a 6-week period of non-weight-bearing rest followed by a gradual, supervised rehabilitation program as the treatment of choice for these stress fractures. Correction of excessive subtalar pronation, present in all four cases, should also be performed. However, it should be noted that the results of all treatment options have been poor in this small series and the possibility of early surgical intervention should not be ruled out.

Practitioners should consider the possibility of

stress fracture of the talus in patients with postero-lateral ankle pain, especially in the absence of a history of acute trauma. We suggest that early diagnosis and treatment will improve the prognosis in this condition, although these cases would suggest that the natural history of the injury is a protracted one, with poor results seen thus far.

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