



**CASE HISTORY:** A 50 year old man who is a runner (30km/week on roads) presents with pain and swelling in his right forefoot. The pain was initially activity related but now occurs at rest. He has had to stop running. He has noticed swelling in the forefoot but no redness or numbness. He is otherwise in extremely good health and gives no history of diabetes or gout. He is a non-smoker. He does not suffer from psoriasis, eye infections and has had no history of sexually transmitted diseases.

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**On examination:** His toes are in slightly abnormal alignment; his second toe is subtly deviated towards his great toe (Figures 3 and 4). He has swelling in the forefoot but no redness. He walks comfortably on heels but is unable to walk on his toes.

He has normal peripheral circulation and sensation. He is maximally tender at the second MTP joint, particularly on the plantar surface. He has a satisfactory range of movement in the second MTP joint. He has no stigmata of psoriasis.

**Investigations:** He brings with him a plain x-ray of the forefoot which is normal.

#### **Differential Diagnosis:**

- Stress fracture
- Arthropathy seronegative or gout
- Neuroma
- Plantar plate tear

#### **What are the clues??**

Fracture: The cardinal clinical sign of fracture is “**point tenderness over bone**”.....x-ray was invented in 1895 but fractures have been diagnosed for millennia by this simple readily elicited clinical sign. Is the patient tender over the distal shaft of the second metatarsal or the metatarsal head?

An arthropathy: will often present with redness and heat with swelling either in the joint or on occasion the whole toe...the so called “sausage digit” or dactylitis is pathognomic of an arthropathy. The finding of psoriasis, in this case in the scalp clinches the diagnosis of psoriatic arthritis. (Figures 1 and 2)

A neuroma: with a mechanically inflamed interdigital bursa will present with pain at the interspace rather than on the bone. Look for altered sensation at the adjacent borders of the second and third toes.

Plantar plate tears: are being increasingly recognised as a cause of forefoot pain in this situation. As per the image below, the second toe is deviated towards the great toe and no longer touches the ground. The patient complains of a “walking on a stone” sensation. The patient may also complain of numbness or paraesthesia in the second toe. This is a traction effect on the nerve and is a cause of confusion with neuroma.

**On examination:** The pain is at the base of the proximal phalanx on the plantar surface. The patient will frequently have a positive toe anterior drawer sign which reproduces their pain.

**Further investigations:** In medicine if you ask the wrong question you get the wrong answer! As plantar plate tears/stress fractures/arthropathies and neuroma/bursas are the likely diagnoses then an MRI with a surface coil and an experienced radiologist is the test likely to be most helpful.

**Treatment:** (depends on the diagnosis).

- Plantar plate tear: Tape the toe and metatarsal dome with rest from impact sport.
- Stress fracture: Rest in a walking boot.
- Acute neuroma/bursa: Ultrasound guided steroid injection.
- Arthropathy/Gout: Anti-inflammatory medication and rheumatological referral.



Figure 1: Dactylitis of second toe  
"sausage digit"



Figure 2: Psoriasis in the scalp



Figures 3 & 4: Typical findings in plantar plate tear – dorsal and medial deviation of the second toe

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