

# FRACTURE OF THE BASE OF THE FIFTH METATARSAL BONE BY INDIRECT VIOLENCE.

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SOME months ago, whilst dancing, I trod on the outer side of my foot, my heel at the moment being off the ground. Something gave way midway down my foot, and I at once suspected a rupture of the peroneus longus tendon. By the help of a friend I managed to walk to my cab, a distance of over 300 or 400 yards. The following morning I carefully examined my foot and discovered that my tendon was intact. There was a slight swelling over the base of the fifth metatarsal bone. I endeavored to obtain crepitus and failed. A finger on the spot gave exquisite pain. Body pressure on the toes, even the slightest, was painful; but when the pressure was deviated to the outer side the pain was still greater. Extension of the ankle and flexion of the toes were immediately felt at the base of the fifth metatarsal.

I hobbled down-stairs to my colleague, Dr. David Morgan, and asked him to X-ray my foot. This was done, and the fifth metatarsal was found fractured about three-fourths of an inch from its base. (Fig. 1.)

I could recall many cases which had come to me with similar symptoms arising from the transmission of body weight to a foot during the position of equino varus. In most cases I had in robust fashion vainly searched for crepitus; in all, the disability lasted several weeks.

I had scarcely recovered, when I saw a young man of thirty years with Dr. Floyd, of Birkenhead. He had been away fishing, and stepping from stone to stone he placed the whole of his body weight upon an inverted foot. He felt, as he said, something

crack in his ankle, and he limped towards his house. The symptoms were identical with my own, and the radiograph showed a precisely similar picture. (Fig. 2.)

A week later, a man of fifty-four years was sent to me from Southport on account of an injury which befell him ten days earlier. He had run to catch his train, twisted the outside of his ankle, and almost fell. He struggled on, however, caught his train, and for some days transacted his business. He had considerable pain, and could scarcely walk by placing pressure on his heel and inner foot alternately. There were swelling and ecchymosis over the metatarsal base, most of which had shown itself some days after the accident. There was pain over the metatarsal base; no crepitus. By this time I could indulge in a positive diagnosis; and I confirmed its accuracy by an X-ray plate. (Fig. 3.)

A fortnight later a powerful looking man of fifty years called upon me. He told me that he had been walking up an inclined plank which yielded, and his foot twisted inward. The injury was painful, but he worked all day, and called on me the following morning. The symptoms closely resembled those I have previously described. I could feel no crepitus, but Dr. Morgan did when manipulating the foot for radiography. The lesion was again found to be just beyond the metatarsal base. (Fig. 4.)

During the same period, Dr. Holland has twice radiographed the same fracture. In one case a lady of fifty years slipped off a step and fell, but no adequate history has been supplied. The fracture, however, is in the same place. (Fig. 5.)

The other patient is one of Mr. Newbolt's, and occurred at the age of sixteen. This patient was submitted to direct violence of a very severe kind, sustaining many injuries to the foot. The only point in common between this and the other cases is that the fifth metatarsal fracture is almost identical. (Fig. 6.)

Now, it is obvious that this fracture is very common, otherwise one would not be able to meet so many cases in so short a time. There is, however, as far as I can find, no reference to it in surgical literature.

For many years I have heard the symptoms of this accident related to me, and, although I often suspected a fracture, it was quite impossible to demonstrate it. The symptoms are



FIG. 1.—Fracture near the base of the fifth metatarsal bone. Case 1.



FIG. 2.—Fracture near the base of the fifth metatarsal bone. Case 2.



FIG. 3.—Fracture near the base of the fifth metatarsal bone. Case 3.

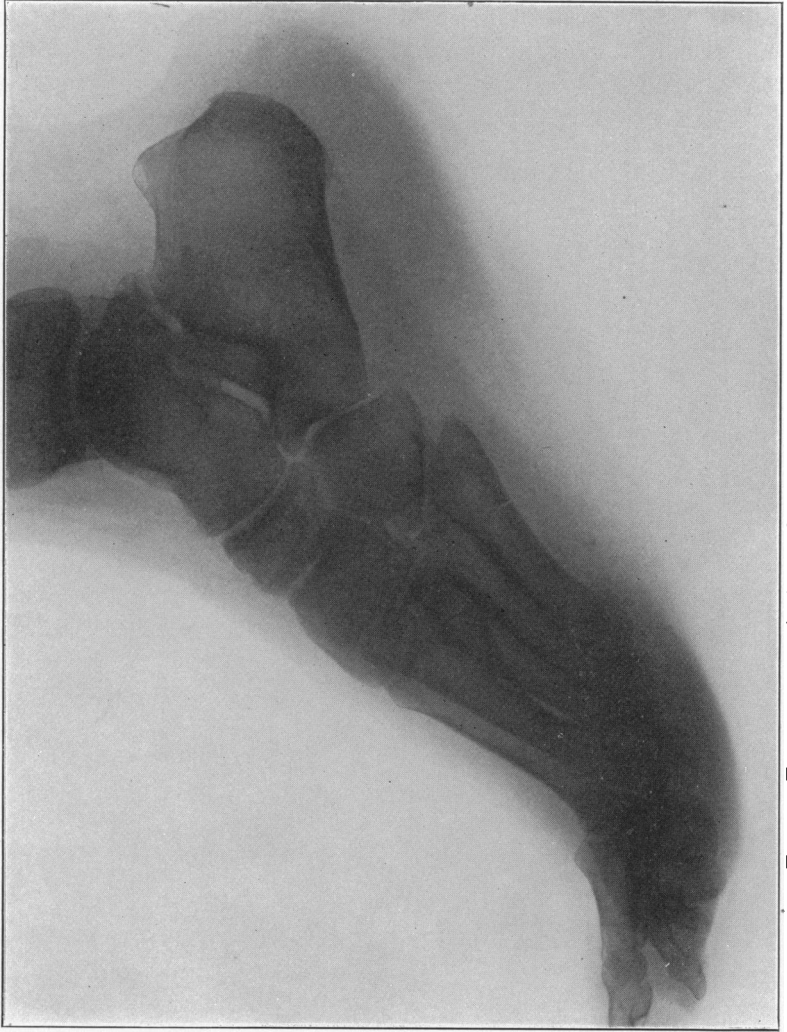


FIG. 4.—Fracture near the base of the fifth metatarsal bone. Case 4.

pain when the patient endeavors to put pressure on toes or inner side of foot, when he fixes the toes, or attempts to invert. The swelling is generally localized over the fractures, and pain is sharp. There is generally no crepitus, no deformity, no yielding on manipulation. The history of the accident is important because it is sufficiently constant to form a factor in the diagnosis. It is a cross-breaking strain directed anteriorly to the metatarsal base and caused by body pressure on an inverted foot while the heel is raised. The fracture is therefore an indirect one. I emphasize this because H. Morris states, "Fractures of the metatarsals are always the result of direct violence." Hamilton, who does not record an instance of this fracture, states, "The metatarsal can scarcely be broken except by a direct blow." Scudder, in his new work, states, "This fracture is caused by direct violence," and Gould and Warren refer only to severe crushing injuries as a cause of metatarsal fracture.

If we briefly look at the anatomy of the bone, more light will be thrown upon the mechanism of its fracture. The prominent base of the fifth metatarsal is closely bound to the cuboid and to the fourth metatarsal by strong ligaments on every side. So powerful are these ligaments that dislocation of the base is the rarest of accidents. It is obviously easier to break the bone than to dislocate it. When the heel, therefore, is off the ground, the body weight expends itself upon the fifth metatarsal, rotating it slightly inward. The opposition to this force takes place at its base, where the strongly attached ligaments resist its displacement. A fracture occurs, therefore, exactly where one would expect it to occur, and where our skiagrams illustrate.

Cremitus is not felt, probably because the line of fracture runs towards the interosseous ligament and the fragments are therefore fixed, or because impaction may occur. As reference to the skiagrams will show, all the lines of fracture cannot be traced quite through the bone, but there can be but little doubt that the fracture is complete. The difficulty in tracing the

fracture line, added to the fact that, like a wedge, it is wider to the outer side, is suggestive of impaction.

There are doubtless mechanical laws which render it easy to localize its site, as is the case in a Colles's or a Pott's fracture, or even in the interesting one of the outer end of the clavicle, governed as it is by the conoid and trapezoid ligaments.





FIG. 5.—Fracture near the base of the fifth metatarsal bone. Case 5.



FIG. 6.—Fracture near the base of the fifth metatarsal bone. Case 6.