CASE REPORT

Traction apophysitis of the fifth metatarsal base in a child: Iselin's disease

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SUMMARY

Although Iselin's disease, apophysitis of the fifth metatarsal base, is not infrequent in clinical practice, it is accepted as a rare cause of lateral foot pain in young adolescents. Usually a simple clinical examination and radiographs are sufficient for diagnosis. We present a patient with Iselin's disease and discuss its clinical and radiographic characteristics, differential diagnosis, aetiopathogenesis and treatment.

BACKGROUND

Iselin's disease (ID) refers to traction apophysitis of the tuberosity of the fifth metatarsal. This condition was first described by Iselin,[1] a German physician, as a form of osteochondrosis in children in 1912. ID is accepted as a rare osteochondrosis of the foot, because there are few cases reported to date.[2–5] However, in routine clinical practice it is not uncommon. Probably, it is underdiagnosed by many physicians due to lack of recognition and lack of suspicion. We aimed to present a case of ID and to discuss its clinical and radiographic characteristics, differential diagnosis, aetiopathogenesis and treatment.

CASE PRESENTATION

A 10-year-old girl presented to our outpatient clinic with the symptoms of intermittent limping, pain and swelling at the base of the fifth metatarsal. Although her symptoms had been present for 6 months, the intensity of the pain had increased markedly during the last month. The pain was aggravated with physical activity, particularly running and jumping. There was no history of antecedent trauma, injury or infection and her medical history was unremarkable.

INVESTIGATIONS

On physical examination, the fifth metatarsal base was prominent, however there was no oedema, ecchymosis, effusion or increased local heat. Ankle range of motion was within normal limits without instability. Neurovascular examination was normal. Direct pressure to the base of the fifth metatarsal base elicited intense pain. Plain radiographic examination showed the fragmentation of the fifth metatarsal apophysis and irregular apophyseal line (figure 1).

DIFFERENTIAL DIAGNOSIS

The differential diagnosis list in the presented case includes ID, avulsion fracture of the fifth metatarsal base, Jones fracture, metatarsal stress fracture, os vesalianum pedis and normal apophysis.

TREATMENT

On the basis of the clinical and imaging findings we made a diagnosis of ID. Non-steroid anti-inflammatory drugs (NSAIDs) were prescribed and strenuous physical activity was restricted.

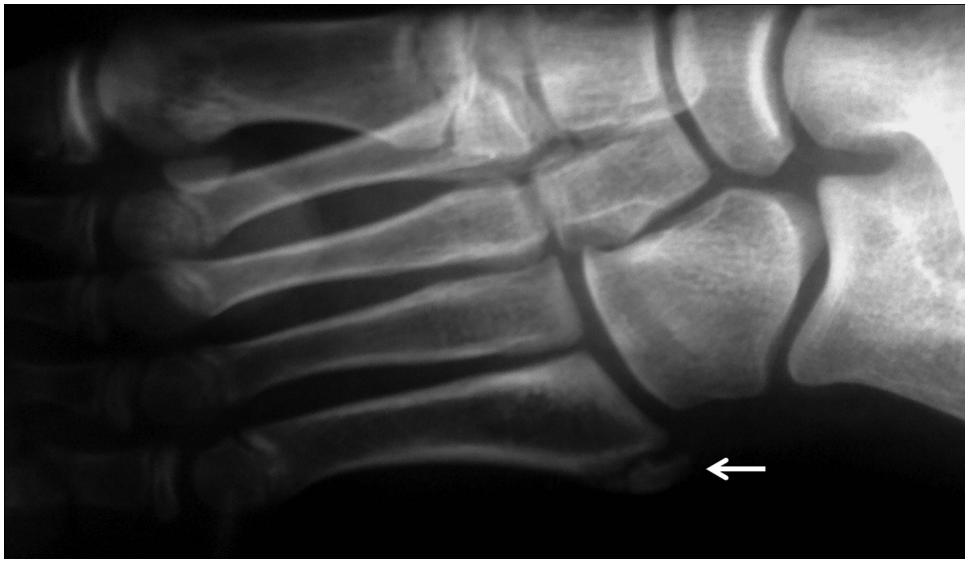

Figure 1 Lateral oblique radiograph of the patient.

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OUTCOME AND FOLLOW-UP

During the course of treatment, the pain subsided within 3 weeks, however the fifth metatarsal base prominence remained. At the final follow-up 6 months after the presentation, the patient was painless and returned to her previous level of activity.

DISCUSSION

Although the exact aetiology of ID is not known, it has been classified under the title of osteochondrosis when seen in growing children, and widely accepted as an overuse injury caused by repetitive microtrauma. Thus, it is usually seen in children engaged in sporting activities which require running and jumping in particular.[6] Repetitive traction of tendons inserted to the base of the fifth metatarsal, namely peroneus brevis and peroneus tertius tendons has been proposed in the aetiology, mimicking the mechanistic relationship between the Osgood Schaltter disease and the patellar tendon.

Patients with ID usually present with lateral foot pain, and difficulty in wearing shoes. Similar to other type of osteochondrosis in the foot, pain is aggravated with strenuous physical activities and relieved with rest. Intermittent limping may also be a presenting symptom similar to our patient. Prominence at the base of the fifth metatarsal and local swelling is frequently noted. The most important physical examination finding is pain with palpation over the tuberosity of the fifth metatarsal.[7] Direct radiographic imaging is sufficient for the diagnosis of ID. However, anteroposterior and lateral projections may not demonstrate the lesion in detail. Lateral oblique radiographs delineate the apophysis clearly due to its inferolateral location. Typically, apophysis shows fragmentation and the physeal line shows irregularities or ondulation different from a normal apophysis (figure 2). The diagnosis of the ID should be made after the exclusion of other possible reasons for pain and swelling at the base of fifth metatarsal. A thorough history should be obtained to exclude prior trauma, penetrating injury and infection, along with a clinical examination in which joint crepitus, instability, deformity or loss of motion is specifically noted.[3 6]

The differential diagnosis of lateral foot pain in a young adolescent patient includes a variety of clinical entities other than ID, namely avulsion fracture of the fifth metatarsal base, Jones fracture, metatarsal stress fracture and os vesalianum pedis. Fifth metatarsal base fractures are common fractures usually seen after acute inversion ankle injuries. Two types of fractures can occur at this area. The first is an avulsion fracture where a small piece of bone is pulled of the metaphysis by peroneus brevis tendon. The second is the Jones fracture, in which the fracture occurs at the metaphyseal-diaphyseal junction, distal to the avulsion fractures. Both of these fractures can be diagnosed simply with direct radiographic examination. However, normal apopyhsis may be mistakenly interpreted as an avulsion fracture in skeletally immature patients.[8] The orientation of the fracture line and apophyseal line is quite different and almost always perpendicular to each other (figure 3). Radiographically, the apophysis appears as longitudinal line parallel to the long axis of the fifth metatarsal, whereas avulsion fractures usually have a transverse orientation. Furthermore, a history of a recent traumatic event, presence of oedema or ecchymosis is helpful in differentiating these two distinct entities on clinical grounds. Apophysis of the fifth metatarsal base appears on radiographs at age 10 for girls, and age 12 for boys. Fusion of the apophysis and the fifth metatarsal base usually takes place within the following 2–4 years.[3 4] Besides acute fifth metatarsal base fractures, stress fractures can occur at the fifth metatarsal base as a result of chronic repetitive trauma. These fractures usually occur at the level of the metatphseal–diaphyseal junction similar to Jones fractures, or at metatarsal diaphysis in young athletes. Finally, symptomatic os vesalianum pedis should be suspected in patients with lateral foot pain. Os vesalianum pedis is a rare

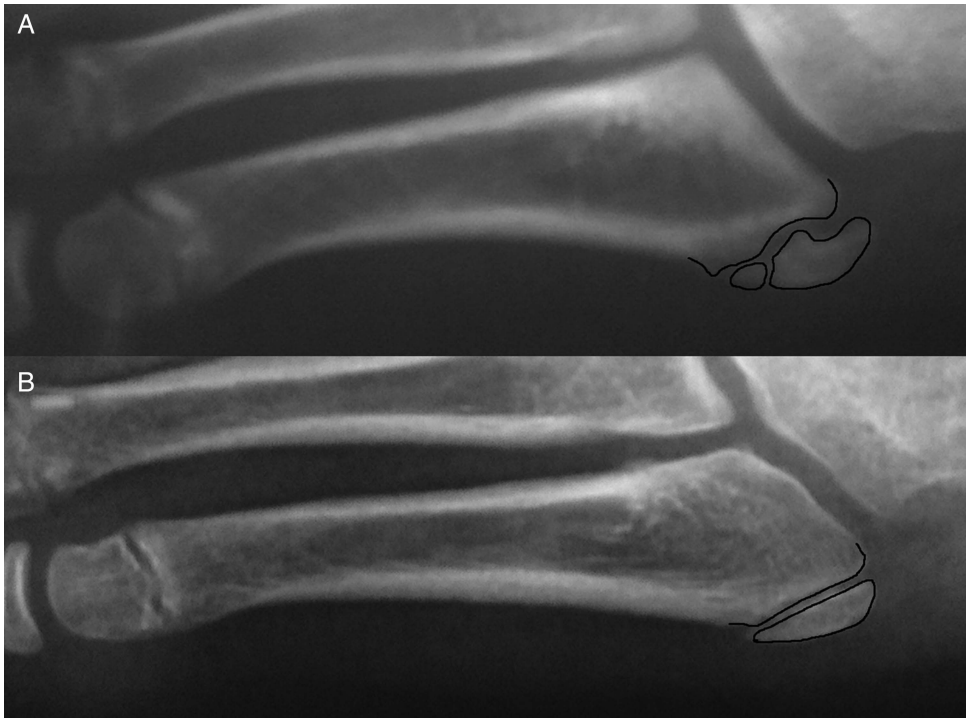

Figure 2 (A) Apophysis in Iselin's disease, black lines showing the apophyseal fragmentation and ondulation. (B) Apophysis in a normal healthy child.

Figure 3 A 9-year-old girl with an avulsion fracture of the fifth metatarsal base. Black arrows showing the fracture line, and white line showing the apopysis. Note their perpendicular orientation.

accessory bone located adjacent to the fifth metatarsal base, embedded in the peroneus brevis tendon. It is usually detected incidentally during radiographic examination due to other reasons; however, it may be a source of pain. Os vesalianum pedis is seen as a well-corticated rounded ossicle that articulates with adjacent cuboid on radiographs.[9] In our patient, clinical radiographic findings were consistent with ID, however all aforementioned clinical entities should be ruled out carefully.

ID is a self-limiting disorder and symptoms usually respond well to NSAIDs and resting. Similarly, in our patient, pain was relieved within 3 weeks after restriction of physical activity. However, it is crucially important to inform the patient and the parents about the aetiopathogenesis of the disease and ensure the parents about the natural course of the disease.[6 7] Some patients with ID may be participants of regular sporting activities or little athletes. In that case, change in the exercising schedule and intensity may be necessary. Shoe modification and padding may be helpful for patients with difficulty in wearing shoes. In recalcitrant cases, short-leg casting can be necessary.

In conclusion, ID should be suspected in children around 10–15 years of age who present with lateral foot pain, particularly on the tuberosity of the fifth metatarsal. A careful history, physical examination findings and a simple lateral oblique foot radiograph are usually diagnostic. Conservative treatment in the form of activity modification, rest and pain control is sufficient for most of the cases.

Learning points

- Iselin's disease (ID), apophysitis of the fifth metatarsal base, should be considered in young adolescent patients with lateral-sided foot pain.
- Apophysis shows fragmentation and physeal line shows irregularities or ondulation different from a normal apohysis in patients with ID.
- In all types of fractures, including avulsion fractures, Jones fracture and stress fractures, the orientation of the fracture line and apophyseal line is quite different and almost always perpendicular to each other.
- Os vesalianum pedis, an accessory ossicle, is seen as a well-corticated rounded bone at the tip of fifth metatarsal base.

Competing interests None.

Patient consent None.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

1 Iselin H. Wachstumbeschwerden zer zeit der knockern entwicklung metatarsi quinti. *Deut Z Chir* 1912;117:529.
2 Ralph BG, Barrett J, Kenyhercz C, *et al*. Iselin's disease: a case presentation of nonunion and review of the differential diagnosis. *J Foot Ankle Surg* 1999;38:409–16.
3 Canale ST, Williams KD. Iselin's disease. *J Pediatr Orthop* 1992;12:90–3.
4 Lehman RC, Gregg JR, Torg E. Iselin's disease. *Am J Sports Med* 1986;14:494–6.
5 Schwartz B, Jay RM, Schoenhaus HD. Apophysitis of the fifth metatarsal base. Iselin's disease. J Am Podiatr Med Assoc 1991;81:128–30.
6 Gillespie H. Osteochondroses and apophyseal injuries of the foot in the young athlete. *Curr Sports Med Rep* 2010;9:265–8.
7 Hoang QB, Mortazavi M. Pediatric overuse injuries in sports. *Adv Pediatr* 2012;59:359–83.
8 Riccardi G, Riccardi D, Marcarelli M, *et al*. Extremely proximal fractures of the fifth metatarsal in the developmental age. *Foot Ankle Int* 2011;32:S526–32.
9 Kose O. The accessory ossicles of the foot and ankle; a diagnostic pitfall in emergency department in context of foot and ankle trauma. *JAEM* 2012;11:106–14.