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The Bipartite Tarsal Scaphoid or Navicular Bone in Basketball Players: Presentation of Two Cases

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Abstract

Brailsford introduced the descriptive term "listhesis" of the tarsal scaphoid to describe the clinic pathological changes associated with congenital bipartition of this bone. This uncommon condition involves the separation and displacement of two scaphoid fragments, producing a fixed flat foot deformity. We report two cases with congenital bipartite tarsal scaphoid in young basketball players. The purpose of this article is to reiterate the features of this entity, and add a further two cases to the reported literature.

Keywords: The bipartite tarsal scaphoid or navicular bone; Congenital; Two cases

Introduction

In 1953 Brailsford [1] used the descriptive term "listhesis" of the tarsal scaphoid to describe an uncommon clinical entity associated with a flat foot. In 1927 and 1928 this lesion which is also called bipartite scaphoid was first described by Muller [2,3] and was initially thought to be the end-result of childhood Kohler's desease.

The purpose of this article is to reiterate the features of this entity, and add a further two cases to the reported literature.

Clinical Material

Two patients reviewed were male. The ages ranged from 5 to 12 years.

Both unilateral and bilateral involvement was noted. There was no proceding history of trauma in any of the patients. Table 1 shows the features of the two cases.

Case Reports

Case 1

A five-year-old boy and young basketball player presented to our department and ambulatory room with bilateral pes planus, minimally symptomatic, and genu valgum deformities of a minor degree. The patient had no history of trauma. The oblique radiographs of both feet revealed the typical features of a bipartite tarsal scaphoid (Figures 1,2). The symptoms disappeared spontaneously in a short time and returned to play to basket.

Case 2

A 12-year-old boy and young basketball player presented to our department and ambulatory room with a history over the previous year of intermittent pain in both feet, in particular on the left foot, associated with weight-bearing. Clinically, he demonstrated a left mild pes planus with no restriction of midtarsal and subtalar movement. The patient had no history of trauma. Oblique radiographs of feet revealed a bipartition on left tarsal scaphoid (Figures 3,4). At the age of 15 years lateral radiograph of left foot demonstrated that tarsal scaphoid was ossified in two portions (Figure 5). His symptoms have been relieved with a moulded arch support. Bone scintigram showed an area of the ipointensive radiotracer in lateral part of the left and right tarsal scaphoids (Figure 6). A particular of CT of left foot demonstrated a bipartition of tarsal scaphoid (Figure 7). The symptoms diseappeared spontaneously after 4 years and returned to play to basket.

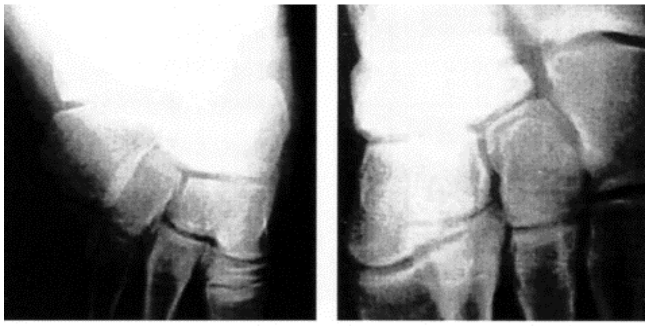

Figure 1&2: The Oblique Radiographs of left and right feet confirmed the features of a bipartite tarsal scaphoid.

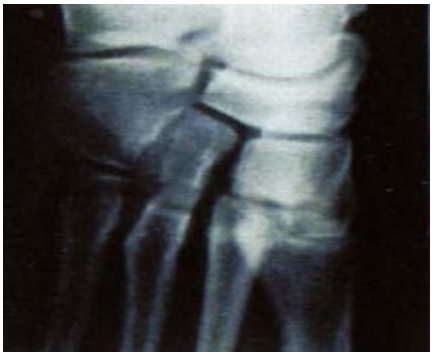

Figure 3: Oblique radiograph of right foot revealed a normal configuration of tarsal scaphoid.

Discussion

Two cases described in the literature involve in young adults. In

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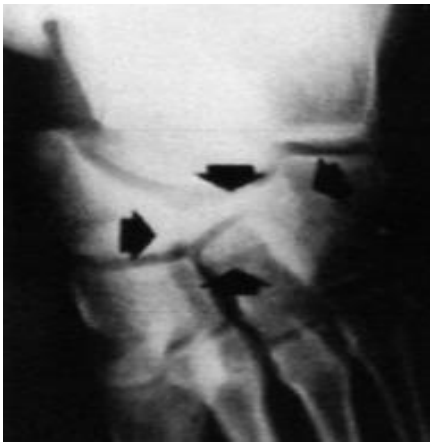

Figure 4: Oblique radiograph of left foot revealed a bipartition of scaphoid.

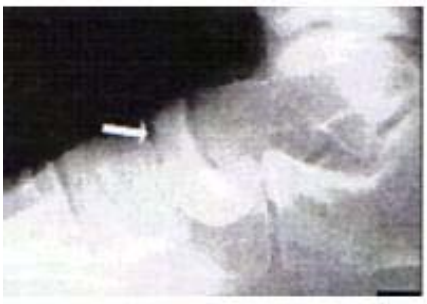

Figure 5: Lateral radiograph of the left foot demonstrated the bipartition of scaphoid (see radiograph).

Brailsford's series of 20 patients only two were under the age of 40 years in 1953 [1]. In 1927 Muller [2] described a case in an 18-year-old girl. In our own series two patients were under 14 years old. It is probable that the lesion exists in childhood but remains unrecognised until there are significant signs and symptoms. The deformity in the foot becomes apparent only after the bipartite fragments of the tarsal scaphoid separate, producing a rather large medial prominence simulating a pes planus deformity. Eventually there is stiffness and pain which occur with advancing degenerative changes in the joint; such changes begin early in life [4].

No active treatment was given. No treatment, other than conservative management of foot pain has been described. The exact cause remains unknown. According to us, the case 1 of bilateral pes planus or deformity was due to a bipartite tarsal scaphoid. The importance of this presentation lies in the fact that condition is common but not usually recognized by the physician ordinarily caring for children, particularly those children with refrectary flatfoot. The symptoms disappeared spontaneously in a short time in case 1. The exact cause remains unknown. We believed that

MRI or CT and scintigram bone were not necessary because the symptoms disappeared spontaneously in a short time.

The case 2 of unilateral pes planus or deformity was due to a bipartite scaphoid associated with weight-bearing. The oblique radiograph of right foot revealed a normal configuration of bipartite

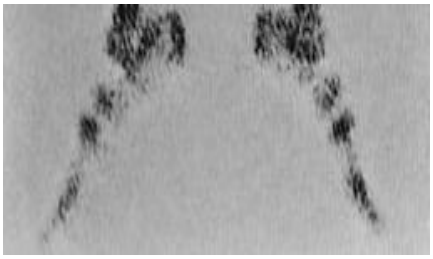

Figure 6: Bone scintigram showed an area of the ipointensive radiotracer in lateral parts of the both tarsal scaphoids.

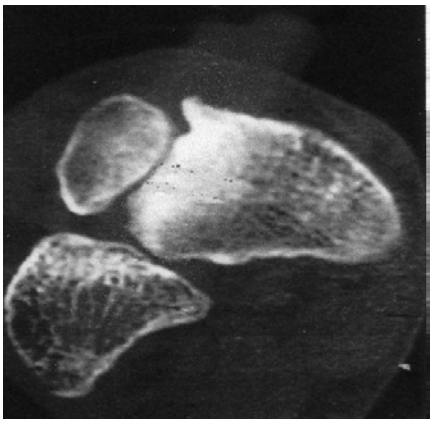

Figure 7: A particular of CT of left foot showed a bipartition of tarsal scaphoid.

scaphoid. We also used CT for mayor experience of radiologist and to make the diagnosis of left bipartite scaphoid. A particular of CT of left foot demonstrated the typical bipartition of tarsal scaphoid. Instead, Scintigram bone showed an area of the ipointensive radiotracer in lateral part of the right and left feet. The symptoms of left foot deseappeared spontaneously after 4 years. The exact cause remains unknown.

The quality of images is enaugh. THESE figures are hystoric in Altamura and Laterza cities in south of Italy. The radiographs and a particular of CT demonstrated a bipartitism of tarsal scaphoid.

Kohler's Disease

There is no reported evidence either clinically, or radio logically to suggest that this condition results in anything else but a normal configuration of tarsal scaphoid [5,6].

Accessory Bones

Two accessory bones related to the tarsal scaphoid are similar in location to the dorsal fragment of the bipartite scaphoid. The os supranaviculare, sometimes called the trochlear process of the astragalus, is a rare accessory bone located dorsally between the talus and the scaphoid. It is usually triangular in shape, of normal osseous structure, and generally coalesces with the scaphoid. The os infranaviculare is situated between the scaphoid and the first and the first cuneiform, usually overriding the latter. The normal shape or structure of the tarsal scaphoid is rarely distorted (Kohler and Zimmer, 1968) [7].

Table 1: The presenting features of the two cases.

Case	Sex	Age (years)	Involvement	Pain	Flat Feet
1	M	5	Bilateral	Bilateral	++
2	M	12	Left	Left	+

Fracture

In 1935 Brailsford [8] attributed the bipartite scaphoid to trauma, occurring as isolated or repeated episodes. Fractures of the scaphoid in a sagittal plane combined with vascular injury may in fact produce a radiographic picture quite similar to the congenital bipartite scaphoid.

Although certain fractures can produce a radiographic and clinical picture of a congenital bipartite scaphoid, it is unlikely that a traumatic incident could produce such similar, consistent deformities.

Fragmentation

Fragmentation of the primary ossific nucleous of the tarsal scaphoid is not uncommon although no cases are known in which such fragmentation evolved into the classical bipartite scaphoid deformity.

The so-called accessory scaphoid, or os tibiale externum is considered the usual result of persistent fragmentation of the primary centre.

Yamaguchi S et al [9] report the cases of 2 adolescent soccer players who underwent internal fixation of the painful bipartite fragments, resulting in nonunion. After failure of conservative management, the patients underwent surgery. Curettage of the junction between the 2 bone fragments was performed, and autologous cancellous bone was grafted. Next, the fragments were fixed with variable-threaded screws. Bone union of the bipartite fragments was once achieved on computed tomography in both cases at 3 and 5 months after surgery, respectively. However, separation of the fragment occurred in both cases after the patients had returned to sports. Although the patients were able to return to sports activities, they still had mild midfoot pain 3 and 2 years after surgery, respectively. Internal fixation using screws and an autologous bone graft for painful bipartite navicular bone in adolescent athletes is not recommended, and other surgeries should be considered to achieve bony union [10].

Avascular Necrosis of the Lateral Third of the Tarsal Scaphoid

This has been previously reported together with a description of the precarious vascular supply of the lateral portion of the tarsal scaphoid [6]. The resulting lesion, usually seen in adults, is a true avascular necrosis with extensive collapse of the involved part of scaphoid.

Although remotely similar radiologically, this lesion is not the classical bipartite scaphoid in which normal viable bone has been noted when the fragment was excised [8,9].

Congenital

Phylogenetically, two tarsal ossification centres, comparable in site to the tarsal scaphoid, can be found in certain primitive reptiles. In mammarian development, however, this particular bone appears as a single centre. It is possible that bipartition may arise from heterogeneous ossification centers. In 1948 this development theory has been argued by Trolle [11] who states that a true bipartition would equal the total size of a normal scaphoid, and two fragments would be in relatively normal anatomical location. In fact our cases may confirm at least part of this theory. The bipartite fragments are not equal in size and with dynamic loading of a foot with weight-bearing the loose scaphoid fragments do not remain in the normal anatomical position.

Conclusion

Two cases in particular lend support to possibility of heterogeneous ossification centres which may be phylogenetic, neogenetic or anomalous in origin.

The diagnosis can most often be made based on radiographs, bone scintigram and computed tomography.

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