Solitary Osteochondromas of the Metatarsal and Cuneiform, in an Adolescent

Nikolaos Laliotis¹, Chrysanthos Chrysanthou¹, Panagiotis Konstandinidis¹, Elisavet Papadopoulou²

Learning Point of the Article:
Solitary osteochondroma can present in the bones of the foot and require surgical treatment.

Abstract

Introduction: Solitary osteochondromas are extremely rare in the bones of the foot. In the growing skeleton, few cases affecting the metatarsals and the talus have been reported. At present, there have been no reports of osteochondromas affecting the cuneiforms.

Case Report: We report the case of a 13-year-old male patient. He presented with marked prominences in the planter surface of his left foot and pain while participating in sporting activities. Radiological examination with X-rays, computed tomography (CT) scan, and magnetic resonance imaging revealed two solitary osteochondromas growing from the medial cuneiform and the head of the 1st metatarsal. The patient was treated surgically by excision of the osteochondromas. Histological examination confirmed the diagnosis of osteochondromas. He had an uneventful recovery and returned to his sporting activities.

Conclusion: Solitary osteochondroma can present in the cuneiform and metatarsal of a growing adolescent. CT scan is useful for the accurate diagnosis and surgical removal of the tumor.

Keywords: Osteochondroma, foot, metatarsal, cuneiform, child.
After a discussion with both the patient and his parents, surgery was recommended. During the operation, we first removed the osteochondroma located on the 1st metatarsal, with care to protect the flexor muscles and the sesamoids. A large osteochondroma 3 × 4 cm was removed. Then using a medial approach, we identified the borders of the cuneiforms and removed the second osteochondroma from the 1st cuneiform. The boundaries of the normal cuneiform were indistinguishable from the osteochondroma. The amount of osteochondroma removed was estimated so that the remaining cuneiform was resembling the normal cuneiform. We used fluoroscopy in an attempt to locate the edges of the normal cuneiform but it had limited success. The second osteochondroma was removed in pieces. The mass removed was a little larger than the osteochondroma of the metatarsal, measuring 4 × 4 cm.

Our patient had an uneventful recovery, with a 4-week period of partial weight-bearing. We performed radiological examination on the lower limbs, to exclude the possibility of multiple osteochondromas located elsewhere. No other osteochondromas were found.

Plain X-ray revealed two distinct well delineated tumors. They both had marked calcification, extending in the plantar surface. One was located in the head of the 1st metatarsal and the other in the area of the cuneiforms. The tumor of the 1st metatarsal was protruding plantar and lateral. It extended to the 1st MTF joint, with enlargement of the joint. The growth plate of the metatarsal and of the proximal phalanx was not affected. The other tumor found on the cuneiform appeared as an osteosclerotic lesion with minimal widening of the joints between the cuneiforms.

A computed tomography (CT) scan was performed confirming the presence of two giant osteochondromas. The first was arising from the 1st metatarsal, communicating with the metatarsal bone. The medial sesamoid was articulating with the osteochondroma, in the plantar area.

The second osteochondroma was found in the area of the cuneiforms, with clear borders. It was communicating with the medial cuneiform, distorting the normal relation of the cuneiforms with the navicular and the metatarsals.

Further investigation with magnetic resonance imaging (MRI) was used, to have more information of the cartilaginous portion of the osteochondromas.
cases with talar osteochondromas, reported by Kumar et al. [2].

A 15-year-old boy presented with tarsal tunnel syndrome, from the pressure of an osteochondroma of the talus [10]. The patient had a similar clinical presentation to one of the three authors reported in a literature review, cases of solitary osteochondromas of the talus, with only 10 cases diagnosed in skeletally immature patients [11]. A case of giant osteochondroma in the neck of the talus was reported in a 19-year-old athlete [12].

A 12-year-old girl presented with a rapidly progressing mass of the sinus tarsi. After an initial biopsy, the tumor was excised and the histological diagnosis of a solitary synovial osteochondroma was made [13].

Recently, a dorsal navicular osteochondroma found in an 11-year-old female, was reported. Investigation with X-rays, CT, 3D reconstruction, and MRI was performed before surgery. A small pedunculated tumor was excised and histology confirmed the diagnosis of osteochondroma [3].

A giant solitary osteochondroma of the 5th metatarsal with erosion of the adjacent metatarsal was found in a 20-year-old patient and treated with excision [14]. Osteochondromas of the metatarsal have been reported in adults [6, 7, 15].

We have not found any cases of solitary osteochondroma affecting the cuneiform.

Discussion

Osteochondromas affecting the foot are extremely rare. Osteochondromas usually are found in the foot in children with multiple exostoses. Solitary osteochondromas affecting the foot are sporadically reported, affecting the calcaneum, talus, or metatarsals [1, 2, 6, 7]. Despite that osteochondromas develop during childhood, they remain undiagnosed until adolescent or in adult life. Delayed diagnosis has also been reported for solitary osteochondromas located in the hand [8].

Symptoms are usually related with the disturbance of weight-bearing. In the foot, the lesions are palpable under the skin. They are not covered by muscle as in the femur so are easily identified. As they grow, they distort the alignment of the metatarsals. They may affect the normal growth, creating short rays. A solitary osteochondroma of the 4th metatarsal was reported in a 13-year-old girl, causing deformation of the adjacent metatarsal. After excision of the osteochondroma, the cosmetic result was satisfactory. The authors report few cases of osteochondromas located in the metatarsals in adolescents [5].

Giant solitary osteochondromas have been described in the calcaneum of adults, where they must be distinguished from sarcomas, in cases of recurrence or if they grow rapidly [4, 9].

A 15-year-old boy presented with tarsal tunnel syndrome, from the pressure of an osteochondroma of the talus [10]. The patient had a similar clinical presentation to one of the three cases with talar osteochondromas, reported by Kumar et al. [2].

An 8-year-old boy presented with a history of repeated ankle sprains and limited movements of the subtalar joint. A solitary osteochondroma of the talus at the sinus tarsi was found. The surgical treatment is the method of choice when treating a giant osteochondroma. It is easy to remove an osteochondroma that is pedunculated, but difficult when it grows from a small rectangular shaped bone, like the cuneiform. In the metatarsal,

Figure 8: (a, b, c) Post-operative CT scan of the cuneiform and metatarsal, with coronal, axial, and sagittal images. There is normal appearance of the metatarsal head and the sesamoid is in normal position. The cuneiform still has remaining elements of the osteochondroma, in the plantar surface. The articulation between the navicular metatarsal and cuneiforms has been restored.

activities, playing for his city team. A post-operative X-ray and CT scan were performed showing restoration of the shape of the 1st metatarsal with normal position of the sesamoids. In the area of the cuneiforms, remnants of the osteochondroma were found in the plantar surface.

The young patient was very happy with the cosmetic appearance of his feet. There is minimal enlargement of the foot. We will continue to follow up the boy, to ensure that there is no recurrence or other disability in his foot.
we tried to protect the flexor muscles and the sesamoids, to minimize further discomfort of our patient.

Recurrence is an exception in the surgical treatment of osteochondromas and when it appears, we must evaluate the patient for the accurate diagnosis [9].

**Conclusion**

We report on a skeletally immature patient with two distinct osteochondromas of the metatarsal and the cuneiform. We describe the clinical and radiological examination. Surgical excision of the osteochondromas relieved the symptoms.

**Declaration of patient consent**: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient’s parents have given their consent for patient images and other clinical information to be reported in the journal. The patient’s parents understand that his names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Conflict of interest**: Nil  
**Source of support**: None

---

**Conflict of Interest**: Nil  
**Source of Support**: Nil

---

**Consent**: The authors confirm that informed consent was obtained from the patient for publication of this case report

---

**How to Cite this Article**

Laliotis N, Chrysanthou C, Konstandinidis P, Papadopoulou E. Solitary Osteochondromas of the Metatarsal and Cuneiform, in an Adolescent. Journal of Orthopaedic Case Reports 2021 July;11(7): 90-93.

---

**References**

1. Fuselier CO, Binning T, Kushner D, Kirchwehm WW, Rice JR, Hetherington V, et al. Solitary osteochondroma of the foot: An in-depth study with case reports. J Foot Surg 1984;23:3-24.

2. Kumar S, Dhammi IK, Jain AK, Shahi P. Osteochondroma of the talus: Three varying cases. BMJ Case Rep 2020;13:e237670.

3. Turati M, Bigoni M, Oreljaniuk RJ, Griffet J, Zatti G, Courvoisier A. Pediatric navicular dorsal osteochondroma: A rare case of navicular-cuneiform impingement. J Pediatr Orthop B 2019;28:602-6.

4. Blitz N, Lopez K. Giant solitary osteochondroma of the inferior medial calcaneal tubercle: A case report and review of the literature. J Foot Ankle Surg 2008;47:206-12.

5. Patil SD, Patil VD, Khan A, Khanore C. Correction of a forefoot deformity caused by a large, solitary metatarsal osteochondroma in an adolescent: A case report. J Foot Ankle Surg 2016;55:427-33.

6. Jadhav PU, Banshelikar SN, Seth BA, Goregaonkar AB. Osteochondromas at Unusual Sites-case series with review of literature. J Orthop Case Reports 2016;6:52-4.

7. Molitor PJ, Myint S. An unusual solitary osteochondroma arising from the first metatarsal bone. Foot 1997;7:37-9.

8. Laliotis NA, Chrysanthou CK, Konstandinidis PA. Solitary osteochondroma of the capitate, in a child. J Clin Orthop Trauma 2018;9:S136-9.

9. Koplay M, Toker S, Sahin L, Kilincoglu V. A calcaneal osteochondroma with recurrence in a skeletally mature patient: A case report. Cases J 2009;2:7013.

10. Won SH, Kim J, Min TH, Chun DI, Yi Y, Han SH, et al. Tarsal tunnel syndrome secondary to osteochondroma of the calcaneus: A case report. BMC Musculoskelet Disord 2020;21:491.

11. Andreacchio A, Marengo L, Canavese F. Solitary osteochondroma of the sinus tarsi. J Pediatr Orthop B 2018;27:88-91.

12. Galanis V, Georgiadi K, Balomenos V, Tsoucalas G, Thomaidis V, Fiska A. Osteochondroma of the talus in a 19-year-old female: A case report and review of the literature. Foot (Edinb) 2020;42:101635.

13. Lui TH. Giant solitary synovial osteochondroma of the subtalar joint. J Foot Ankle Surg 2016;55:183-7.

14. Yildirim C, Rodop O, Kuşkucu M, Sahin O, Gamsizkan M. Giant solitary osteochondroma arising from the fifth metatarsal bone: A case report. J Foot Ankle Surg 2010;49:298.e9-15.

15. Shtofmakher G, Kaufman MA, Bhoola PH, Patel AA, Rice SM, Cohen RE. Multiple osteocartilaginous exostoses of the lower extremity: A case report. Foot (Edinb) 2015;25:62-5.