CASE REPORT

Symptomatic Os Subtibiale Associated with Chronic Pain Around the Medial Malleolus in a Young Athlete

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An os subtibiale is a rare accessory bone located below or behind the medial malleolus. Herein we present a rare case of a painful os subtibiale in a young triathlete who presented with pain, redness and swelling below his left medial malleolus. Plain radiographs and three-dimensional computed tomography revealed a well-defined oval bone distal to the left medial malleolus. After conservative treatment failed, the ossicle was excised in an open surgery with complete resolution of symptoms. This case report emphasizes the need for clinical awareness of different anatomical variations of the bones of the foot.

INTRODUCTION

A large number of accessory bones are located in the foot and ankle. Os subtibiale is a rare accessory bone located distally or dorsally to the medial malleolus.¹ It is considered a normal variant of the medial malleolus where an articulating portion of the medial malleolus is a separate ossicle.² It is thought that the os subtibiale originates as a failure of fusion of a secondary ossification center to the medial malleolus or as a result of an avulsion fracture. Most commonly it presents as a rounded ossicle of variable size and is often found bilaterally. Most of the accessory ossicles are asymptomatic and are therefore found incidentally when assessing an injury or fracture to the ankle or foot.³ Although the os subtibiale does not often cause symptoms such as pain or limitation of motion at the ankle joint,

after trauma or overuse it can become symptomatic and some patients might require treatment.

In the present case report, we describe a young triathlete with a symptomatic os subtibiale who underwent open surgery. We discuss its characteristics from anatomical and clinical point of view.

CASE REPORT

An 18-year-old male triathlete presented with a several months' history of localized pain, redness and swelling on the medial side of the left ankle after strenuous training. He trained intensively, three/four times a week and had no history of ankle sprains on either side. Initially pain and swelling appeared only during physical exercise but gradually these were present even during everyday activities.

On physical examination, we noted redness,

Figure 1. **a.** Preoperative plain radiograph showing an os subtibiale of the medial malleolus; **b.** A three-dimensional computed tomography scan showed more accurately the characteristics of the ossicle and its dimensions; **c.** Postoperative plain radiograph confirmed the excision of the os subtibiale.

slight swelling, tenderness and pain on palpation in the distal portion of the medial side of the left ankle. The point where pain was felt corresponded to the location of the ossicle, but mobility of the ossicle was not clear on palpation. There was a slight difference in the range of motion between the right and the left ankle.

Plain radiographs visualized an oval bone below the left medial malleolus on the anterior view (Fig. 1a) and a smaller oval bone below the right medial malleolus. Three-dimensional CT confirmed the radiographic findings and revealed a more accurate location and shape of the ossicles (Fig. 1b). The os subtibiale in the left ankle was 6 mm long and 4 mm wide. The patient initially underwent conservative treatment which included rest, non-steroidal anti-inflammatory drugs and physical therapy. Conservative treatment had a good effect and pain was relieved initially. However, after the patient resumed intensive training,

the symptoms recurred and surgical treatment was therefore indicated.

Surgery was performed through a direct medial approach. The ossicle was dissected free from its soft-tissue attachments and was excised entirely. The deltoid ligament was preserved. The wound was closed in the usual manner over a drain. The excision was confirmed on a postoperative radiograph (Fig. 1c). The histological findings revealed a chronic inflammatory reaction, with multiple lymphocytes, fibroblasts, fibrocytes and formation of new blood vessels. A process of organization, with formation of excessive fibrous tissue, especially around the vessels and partial calcification were observed (Fig. 2). Brace immobilization was used postoperatively for 3 weeks. The patient was allowed to bear weight and to carry out muscle-stimulating physiotherapy. About 7-8 weeks postoperatively, the patient was allowed to engage in sports activities. Follow-up after 8 months revealed normal clinical findings and return to full function and level of competitiveness.

Figure 2. The histological findings, revealing a chronic inflammatory reaction (HE x 200).

DISCUSSION

Accessory bones are often found in the foot. Apart from os subtibiale, these include the os trigonum⁴, the accessory navicular bone⁵, the os peroneum, the os supratalare⁶, etc.

There is very little literature available on the accessory bone of the medial malleolus, the os subtibiale. The distal epiphyseal center of the tibia appears in the first year of life and merges with the shaft at about the age of fifteen in females and seventeen in males. The medial malleolus generally develops from the distal epiphysis, and ossifies in the seventh year.⁷ Sometimes a separate

ossification center can be observed. An accessory bone is formed when the separate epiphysis of the medial malleolus fails to fuse with the distal tibia.⁸ A review of the literature showed that the average size of the ossicle in symptomatic patients is about 7 mm.¹ We therefore think that it would be appropriate to differentiate the following two groups: type I os subtibiale with average size less than 7 mm and type II more than 7 mm, with most symptomatic cases being associated with the latter group. Although the size of the additional ossicle in our case is less than 7 mm, the explanation for the presented symptomatic os subtibiale is a result of the abnormal mechanical load of the ankle in active athletes.

Accessory ossicles of the medial malleolus can form not only as a result of a secondary ossification center but due to avulsion injuries as well. The secondary ossification center normally fuses with the distal portion of the tibia at the age of fourteen at latest.⁹ The presence of ossicles after this age is associated with avulsion injuries or repetitive trauma caused by the increased mechanical load due to intensive physical activity. Also, calcifications in the deltoid ligament due to repetitive microtrauma are often found in patients with a history of multiple ankle sprains. However, in our case, os subtibiale was present bilaterally, leading to the conclusion that it developed as a result of an unfused ossification center rather than an avulsion injury, as the patient did not report history of such trauma. Due to the nature of the sport he practiced, the intense physical activity led to the symptoms observed in our case (after the age of 14 years). The symptoms affect the left ankle, most probably because of the bigger size of the ossicle.

Initial treatment is usually non-operative and includes rest, immobilization, anti-inflammatory medication, and muscle stretching/strengthening. Surgery should be performed for patients who do not improve after non-operative treatment or desire an early return to physical activities.¹⁰ An often-used technique to treat the symptomatic os subtibiale is arthroscopic surgery, which is considered to be

minimally invasive.⁹

In conclusion, the present case report demonstrates the occurrence of the accessory os subtibiale in an 18-year-old male athlete. The presence of additional ossicles should be part of the differential diagnosis when assessing a patient presenting with symptoms of pain, redness and swelling below the medial malleolus, not only as a result of acute trauma but also as a result of chronic intensive physical activity.

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Симптоматическая os subtibiale, связанная с хронической болью в области медиальной лодыжки у молодого спортсмена

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Os subtibiale – редко встречающаяся добавочная кость, расположенная ниже или позади медиальной лодыжки. Здесь мы представляем редкий случай болезненной os subtibiale у молодого триатлета с болью, покраснением и припухлостью под левой лодыжкой. Обычные рентгенограммы и трехмерная компьютерная томография показали хорошо выраженную овальную кость в дистальной части левой

медиальной лодыжки. После неуспешного консервативного лечения, косточка была вырезана с помощью открытого оперативного вмешательства с полной регрессией симптомов. Настоящее описание клинического случая подчеркивает необходимость клинической осведомленности о различных анатомических вариациях костей стопы.

Ключевые слова: os subtibiale, боль в лодыжке, хирургия