Chondroblastoma of the metatarsal bone and its 17-year follow-up

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Chondroblastoma (CB) is a fairly uncommon, benign, cartilaginous tumor, that usually affects the epiphysis of long bones in children and adolescents.1,2 It is first described as a distinctive clinicopathologic entity most likely arising from chondroblasts by Jaffe and Lichtenstein, as benign chondroblastoma of bone. It has a predilection for long bones most commonly distal femur and proximal tibia. It also occurs in small bones of hand and feet such as talus, calcaneus, cuboid and metatarsal bones.1-3 Metatarsal bone is an uncommon location for CB.2,3,5

This is the report of a case with CB located in the proximal region of the fourth metatarsal, treated with curettage and packing with cancellous bone and followed up for 16 years without any signs of local recurrence.

Case report

A 23-year-old male patient was referred by his primary care physician to our center with an eight-month history of persistent pain on the lateral side of his right foot developed after an inversion type ankle sprain.

Initial examination revealed mild swelling on the dorsolateral aspect of the middle part of the foot with normal alignment and gait, also tenderness on palpation. Rest of the physical examination was unremarkable. Active and passive ROM of both feet and ankle were full unrestricted and symmetric. There was no fever, chills, or weight loss. Laboratory tests including complete...
blood cell count, alkaline phosphatase, calcium levels, C-reactive Protein, erythrocyte sedimentation rate were normal. There was no lung metastasis investigated by computerized tomography.

Imaging studies including plain radiographs of the right foot were obtained (Fig I). The radiographs demonstrated a large lucent, osteolytic lesion with thin sclerotic borders within the medulla of the fourth metatarsal. There was thinning and expanding on the cortical bone surrounding the lesion. The lesion appeared to involve the proximal half of the fourth metatarsal. The lobulated, expanding, osteolytic lesion had sclerotic margins and was 30 x 20 x 45 mm in dimensions. Computerized tomography scans (Fig II) showed a large defect with scalloped, sclerotic and well-defined margins. There was no evidence of fracture, cortical destruction and soft tissue extension. Intraleional calcification was not present.

The fine needle aspiration biopsy revealed the immature chonrocytes without any signs of malignancy. Curettage and packing with cancellous autogenous bone grafting obtained from the iliac crest were performed. Post operative radiographs demonstrated good consolidation of bone graft at 4 months follow up. Microscopic examination of the curettage material revealed uniform, polygonal and round cells with oval or slightly indented nuclei and also multinucleated giant cells in immature chondroid material which supported the diagnosis of CB (Fig III). The patient was called to follow-up at second and sixth weeks, third, sixth and twelweth months and every six months till third year after operation. No complaint was noted after the third month follow-up. There was no clinical and radiological evidence of local tumor recurrence at the sixteen years follow-up (Fig IV).

**Discussion**

Chondroblastoma, also known as Codman’s Tumor, is a fairly uncommon bone tumor that arises from immature chondroblasts.\cite{3,6,7} It accounts for approximately 1% of all primary bone tumors.\cite{2,3,6,7} Cl...
nically, CB is relatively non-aggressive and is usually readily curable with curettage and bone grafting.\[^7\] Metastasis, malignant transformation and local aggressive behavior have been reported but are extremely rare.\[^8,9\] Approximately 50% of all CB occur in skeletally immature patients with a peak incidence in the second decade. There is a male preponderance ranging from 60% to 81%.\[^5,10\] The cases involving the flat bones tend to occur in slightly older patients.\[^5\] The age and gender of our patient was no exception.

Chondroblastoma has been reported in numerous locations, predominantly in the secondary ossification centers of long bones, with the distal femur, proximal tibia and proximal humerus.\[^3,9\] Chondroblastoma is also reported in talus, calcaneus, patella, cuboid, metacarpal bones, triquetrum, and acromion.\[^1,3,4\] Metatarsal bone is an uncommon location for CB with a few number of cases reported up to authors knowledge.\[^2,3,5\]

The most common clinical presentation is localized pain and occasional swelling.\[^6,9\] Limited range of motion, effusion of the adjacent joint, local warmth and tenderness may be present.\[^11\] Pathological fracture may be present in 1% to 13% of the cases.\[^9\] In our case pain was the main presenting symptom in the absence of swelling, effusion and pathological fracture.

Radiologically, CB frequently has an oval or round configuration at an eccentric epiphyseal location. Chondroblastoma appear as ill-defined, osteolytic lesion with a thin sclerotic margin. The tumor size may range from 1 to 10 cm in diameter. The surrounding cortical bone is usually expanded and cortical destruction with adjacent soft tissue mass may be present. Punctuate calcification may be present.\[^9,10\] In the present study, radiological features of the tumor are parallel to the previous reports.

Gross examination of the tumor usually reveals grayish-pink material with occasional foci of calcifications, hemorrhages, or necrosis. Microscopic examination reveals oval mononuclear cells, osteoclast like multinucleated giant cells, calcified cartilaginous intra cellular matrix with chicken wire appearance.\[^6,10\]

The mainstay of the treatment for CB is removal of the lesion and filling the lesion cavity with bone grafting or synthetic materials.\[^9,12\] Recurrences were reported in 10 to 45% of cases after surgical treatment.\[^9\] Other adjuvant treatment modalities have been used such as cryosurgery and phenol application, however recurrences may also be seen with these techniques.\[^17\] Chemotherapy has no place in the treatment of CB.\[^6\] Some authors suggest radiotherapy in the treatment of CB, but there is considerable controversy because of the risk of malignant transformation after irradiation.\[^9,13\] We did not prefer radiotherapy because of the probable risk of malignant transformation. In our case, treated with curettage and bone grafting, at the 16 years follow-up visit there is no evidence of local recurrence or metastasis.

**References**