Chondroma of the Subcutaneous Bursa of the Achilles Tendon

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Abstract
A 46-year-old female presented a six-month history of posterior heel pain. Clinical and radiographical examination revealed a nodular calcified mass into the subcutaneous tissue of the Achilles tendon bursa. Following excision, histopathology showed an extraskeletal soft-tissue chondroma. Follow up at 24 months showed no recurrence. To our knowledge, this is the first description of a soft tissue chondroma at this site: some soft tissue tumors develop at unusual anatomic location.

Extraskeletal chondromas occur as multiple nodules of synovial chondromatosis within a joint, as a solitary lesion within or adjacent to joint, or as an isolated cartilagenous lesion in the soft tissues, mostly of the hands and feet. The latter two groups of extraskeletal chondromas are rare, and frequently exhibit areas of immature cartilage with histological features which could mislead the pathologist to a diagnosis of chondrosarcoma. Histological features do not differentiate articular from para-articular and soft tissue chondromas.1

Posterior heel pain can be caused by pathology of the Achilles tendon, its tendon sheath, the retrocalcaneal and subcutaneous bursae, by osteophytes or stress fracture of the os calcis, and by rheumatoid or metabolic diseases.2 We report a patient in whom a chondroma affected the subcutaneous Achilles tendon bursa.

Case Report
A 46-year-old female presented with a six-month history of posterior heel pain. She was unable to wear closed shoes. She could not remember any trauma, and serology did not reveal any metabolic or rheumatic conditions. Clinical history was negative for neoplasm.

Clinical examination revealed a firm nodular mass 2 cm in diameter, directly under the skin over the calcaneal insertion of the Achilles tendon. The area was reddened and

Figure 1 Lateral soft tissue radiographs at presentation.
tender. The range of motion of the ankle and subtalar joints was normal, as was the neurovascular examination. Soft tissue radiographs showed a calcification of the subcutaneous Achilles bursa with no bone involvement (Fig. 1).

Excision of the mass was performed under regional anaesthesia with the patient prone in a bloodless field furnished by a calf tourniquet; a 3 cm longitudinal incision was made along the course of the Achilles bursa. The mass was located on the posterior aspect of the Achilles tendon and was dissected and excised. The subcutaneous calcaneal bursa was absent. The Achilles tendon was not involved in the process. Weight bearing was allowed in the immediate postoperative period.

Postoperative recovery was uneventful. The patient returned to her activities of daily living four weeks after the procedure. When last reviewed 24 months after the excision, she was asymptomatic with no clinical and radiographic signs of recurrence of the mass (Fig. 2). She was able to weight bear fully while wearing normal shoes.

Pathological Findings

The firm mass showed a nodular appearance with a diameter of 2 cm and sharply demarcated edges (Fig. 3). Under light microscopy, the nodule showed mature hyaline cartilaginous tissue arranged in a lobular pattern with rare hypercellular areas without features of infiltration of the surrounding fibrous tissue. At higher magnification, some chondrocytes showed foci of slight nuclear hyperchromatism. There was no evidence of malignant features and absence of mitotic activity (Fig. 4). The final diagnosis was soft tissue chondroma.

Discussion

Our patient presented an extraskeletal chondroma over the posterior aspect of the Achilles tendon that developed into the subcutaneous tissue of the Achilles bursa producing posterior heel pain. Posterior heel pain can be caused by several conditions, including calcaneal bursitis, pathologies of the Achilles tendon, its tendon sheath, the retrocalcaneal bursae, osteophytes or stress fracture of the os calcis, and by rheumatoid, metabolic, and neoplastic diseases. The retrocalcaneal bursa is more commonly affected than the subcutaneous bursa.

One hundred and four cases of extraskeletal chondroma, 25 of which occurred in the lower limb, were reported by Chung and Enzinger. However, these investigators did not report any cases involving the Achilles bursae, and stressed the need to differentiate extraskeletal soft-tissue chondromas from soft synovial bursae and tenosynovial chondromatosis, giant cell tumors of the tendon sheath, myxomas, and chondrosarcomas. The tumor, then named “chondromas of the soft tissues,” appeared around the small joints of the hands in 64% and of the feet in 20% of the cases. These slow-growing tumors can develop at any age, although they are more frequent in the third and fourth decades of life. Symptoms are generally not specific; these tumors produce tenderness, swelling, pain and limited motion of the adjacent joint, warmth, and erythema. Radiographs often show a lobular appearance on the volar or dorsal side of the small joints, with various calcifications and ossifications. Histologically, the lesions are generally composed of mature hyaline cartilage, with the possible occurrence of calcification as well as metaplastic ossification. Occasionally, some binucleated...
chondrocytes and a slight nuclear hyperchromasia can be present and may mimic malignancy.\textsuperscript{4,8}

The principal clinical differential diagnosis are extraskeletal mesenchimal chondrosarcoma, giant cell tumor of the tendon sheath with foci of cartilaginous metaplasia, calcifying aponeurotic fibroma, synovial chondromatosis, and nodular chondrometaplasia. After excision, benign extraskeletal chondroma can recur in 15\% to 20\% of the cases.\textsuperscript{4}

In the present case of soft tissue chondroma, some atypical condrocytes and rare foci of hypercellularity were observed, but the neoplasm retained a lobular architecture and showed no features of infiltration of surrounding tissues. These histological features distinguished it from mesenchimal chondrosarcoma, which is not normally found at this site and shows more obvious malignant characteristics. A chondro-metaplastic nature of the lesion can be excluded when there is no history of trauma and from the absence of a transitional area between peripheral fibroblasts and chondrocytes at histology.\textsuperscript{4,6}

Synovial chondromatosis can be histologically similar to soft tissue chondroma, but it shows multiple nodules arising in the synovium. It is usually an intra-articular condition, can involve the bone\textsuperscript{9} with a high local recurrence rate, and it is very rare in the hands and feet.\textsuperscript{10} Giant cell tumors of tendon sheath and calcifying aponeurotic fibromas are easily diagnosed through histologic evaluation. In our patient, the absence of recurrence at follow-up after 24 months confirms the benign nature of the lesion.

In conclusion, an integrated clinical-pathologic diagnosis helps to clarify the nature of extraskeletal cartilaginous tumors that can arise at an unusual anatomic site. Complete local surgical excision is the treatment of choice.

References