

Soft Tissue Chondroma: Two Cases Report and Literature Review

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Abstract

Introduction: Soft tissue chondroma is a very rare, slow progressing, benign tumor. It has a specific tendency for hands and feet. It can exhibit worrisome radiographic and histologic features mimicking chondrosarcomas. **Case 1:** A 54-year-old man was presented with a big mass in the left thigh. At magnetic resonance imaging (MRI), the lesion exhibited a heterogeneous pattern, localized in muscle without infiltration. Open biopsy was performed showed a soft tissue chondroma. **Case 2:** A 40 years old man presented with a hard mass on the right iliac fossa. TDM showed a well circumscribed soft tissue mass with a heterogeneous pattern. Histological assessment of the resected specimen confirmed a soft tissue chondroma. **Conclusion:** Soft tissue chondroma is a very rare benign tumor. In our case, the tumor presented with an unusual location and radiological appearance, suggesting a malignant process. The diagnosis was rectified thanks to pathological examination.

Keywords

Soft Tissue, Chondroma, Calcification, MRI, Thigh, The Right Iliac Fossa

1. Introduction

Soft tissue chondroma is a rare benign tumor. It refers to a tumor with well-defined nodules of cartilages developed in soft tissue and unattached to bone or periosteum. The principal sites of occurrence are hands and feet [1]. It affects both sexes equally and mainly occurs in patients aged 30 - 60 years [2]-[5]. Extraskelatal Chondroma

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probably arises from the fibrous stroma and not from mature cartilaginous or osseous tissue [5] [6]. It differs from juxtacortical or periosteal chondroma which is a benign tumor located between the bone and periosteum [5] [6].

MRI is the method of choice in the evaluation of this rare clinical entity. This tumor rarely evolves into a malignant tumor [7]-[9]. Positive diagnosis can only be provided by the histopathological examination. Surgical treatment is the only successful solution but recurrence is not uncommon [2] [10]-[12]. In this article, we report on two cases of soft tissue chondroma with an atypical sites and presentation.

2. Case Report

2.1. Case 1

A 54-year-old man was presented with slowly progressive mass in the inner face of the left thigh, of around 4 years' duration. Physical examination showed a solid painful and firm mass on the inner face of the left thigh, measuring 50cm in diameter. This mass was ill-defined and attached to the two muscle layers. General clinical assessment was normal. Hematological and biochemical tests were within normal limits. An X-ray of the front and lateral views showed a normal bony skeleton of the thigh with no evidence of calcifications.

At magnetic resonance imaging (MRI), the lesion exhibited a heterogeneous pattern, mostly in low signal on T1 and T2 weighted images (**Figure 1**). This tumor is localized in muscle without infiltration. The periosteum of the bones was intact. After administration of intravenous contrast material, a heterogeneous enhancement is seen (**Figure 2**).

Open biopsy was performed. Histologic examination revealed a heavily lobulated tumor. Chondrocytes were in hyaline matrix. The diagnosis of soft tissue chondroma was confirmed.

2.2. Case 2

A 40 years old man presented with a hard mass on the right iliac fossa. The mass had appeared about 3 years ago. It had enlarged slowly until reaching 11cm in diameter.

On physical examination, a hard, immobile and lobulated mass at the right iliac fossa was present. Radiographs of the right iliac fossa showed a 100 mm calcified mass developed in soft tissue, not attached to periosteum.

TDM showed a well circumscribed soft tissue mass with a heterogeneous pattern. The lesion showed well demarcated lobulated and fully calcified matrix. The patient underwent surgical resection. The gross pathological specimen showed a firm lobulated white calcified mass. Histological assessment of the resected specimen confirmed a soft tissue chondroma.

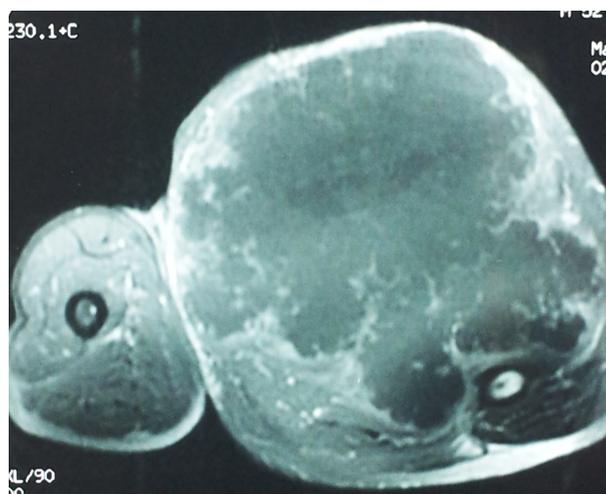


Figure 1. T1-weighted MR axial image show the lesion localized in muscle without infiltration. The lesion exhibited a heterogeneous pattern, mostly in low signal T1.

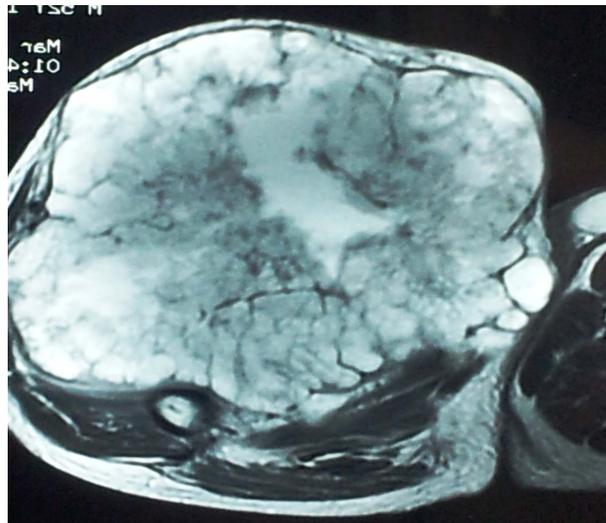


Figure 2. MRI of the lesion in axial plane. After administration of intravenous contrast material. Heterogeneous enhancement is seen.

3. Discussion

Soft tissue chondromas represent approximately 1.5% of all benign soft tissue tumors [1] [13]. The tumor mainly affects 30 - 60 years old adults. There is no gender predilection. Almost all lesions are found in the extremities, frequently in hands [1] [14]. Soft tissue chondromas seem to appear *de novo* without any precursor lesion. They occur typically in the extremities, often near tendon or tendon sheath, joint capsule, or periosteum. In our cases, the mass was far of extremities. Soft tissue chondromas are well-defined nodules, rarely exceeding 2 cm in diameter. But, in our cases, the tumors were very large.

The typical clinical presentation is that a pain less, slowly enlarging nodular soft tissue mass that is usually present for variable time prior to diagnosis. In approximately 20% of the patients, the lesion is painful and tender, as in our cases, especially if located in the planter aspect of the foot [5] [15] [16]. Almost all of these tumors are solitary, but Dellon *et al.* [17] [18], reported bilateral chondromas in the right index and left ring fingers in a patient with renal failure. Multiple extraosseous chondromas are more likely examples of synovial chondromatosis. The association of pulmonary chondroma, gastric epithelial stromal tumor, and extra-adrenal paraganglioma is known as Carney's triad [5] [19].

The imaging features of soft tissue chondromas depend on the amount of calcification and the response of the surrounding tissues. The pattern of mineralization seems variable. Older lesions may contain focal or extensive calcifications, which predominantly occur at the center of the mass. Often, mineralization has a ringlike, punctate, or granular appearance, suggesting the presence of hyaline cartilage. Sometimes, mineralization is lacking or has an unusual form. In nearly 30% the cases [1] [20], diffuse calcification may obscure the cartilaginous nature of the lesion [1] [21] and mimic tumoral calcinosis.

Soft tissue chondromas usually show peripheral enhancement on post-contrast MR images, with normal adjacent soft tissues. MRI showed high signal intensity mass on T2-weighted images. A homogeneous, predominantly high signal intensity lesion on T2-weighted images is a features encountered in most neoplasms. This finding has no specificity and it is not especially suggestive of a benign cartilaginous mass [5] [15] [19] [21].

Macroscopically extraskeletal chondromas are usually lobulated, well-encapsulated, rubbery tumors [5] [19]. The lesions are firm on palpation. However, if cystic degeneration has occurred, they may be soft and friable.

Microscopically, soft tissue chondromas vary considerably in appearance. Most consist of hyaline cartilage arranged in lobular pattern (Figure 3, Figure 4), and may focal fibrosis (fibrochondromas), ossification (osteochondromas), or myxoid change (myxoidchondromas). Vascular fibrous capsules may be observed occasionally [5] [22]-[24]. The chondrocytes are small, lying in lacunae with rond and regular nuclei (Figure 5). Diffuse calcifications may occur, completely obscuring the cartilaginous nature of the lesion [5]. In some variants, the cartilage matrix becomes extensively mineralized, often associated with necrosis of chondrocytes, causing the tumor

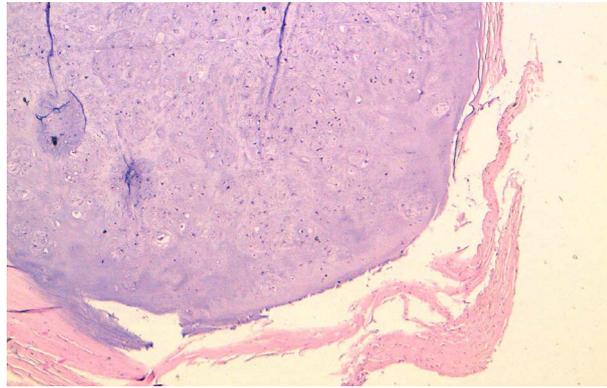


Figure 3. Well-demarcated lesion with no tendency to permeation (HES $\times 4$).

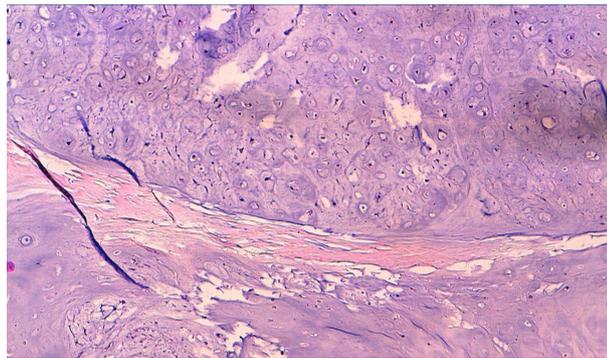


Figure 4. The lobules are separated by fibrous septae (HES $\times 10$).

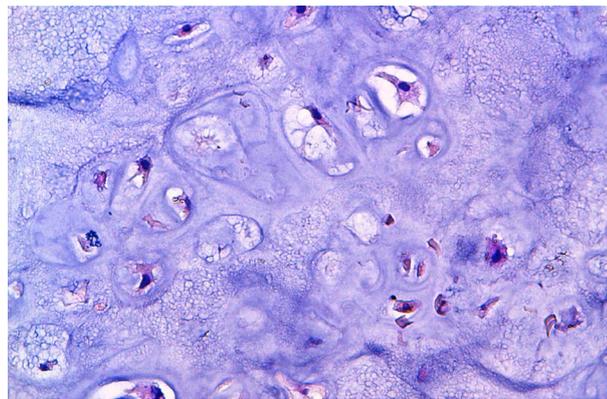


Figure 5. Small chondrocytes lying in lacunae with round and regular nuclei (HES $\times 40$).

to resemble tumoral calcinosis. Hyaline cartilage may also undergo enchondral ossification, mimicking an osteogenic neoplasm or a reactive lesion. Myxoid degeneration may create confusion with extraskeletal myxoid chondrosarcoma [25]. Chondroblastic variants, with immature cells, hyperchromatic nuclei, binucleated cells and mitotic figures can also occur [5].

Similar to normal chondrocytes, the cells of the soft tissue chondroma are positive for vimentin and S-100 protein [5] [19]. Electron microscopy studies show chondrocytes with larger indented nuclei, abundant rough endoplasmic reticulum and intermittent membrane-bound vacuoles. Short microvilli processes or filopodia, extend from the cytoplasmic surfaces into the surrounding intercellular matrix. In Calcified lesions, the latter con-

tain variously sized aggregates of hydroxyapatite crystals [5] [19].

Cytogenetic studies of chondromas are scarce. A total of 16 cases with abnormal karyotypes have been reported: 6 enchondromas, 4 periosteal chondromas, and 6 soft part chondromas. No consistent abnormality has been detected, although chromosome or chromosomal region 4, 5, 6, 7 and 12q13-15 seems to be non randomly involved in changes [25].

The differential diagnosis of soft tissue chondroma includes synovial chondromatosis (usually multifocal), chondrosarcomas, periosteal or juxtacortical chondrosarcomas, synovial cell sarcomas, mature myositis ossificans, foreign body granulomas, angioliomyomas, calcified lipomas, and occasionally juxtacortical chondromyxoid fibromas, periosteal desmoid tumors, tumoralcalcinosis and calcifyingaponeurotic fibroma [5] [15] [19].

Extraskelatal chondromas and synovial chondromatosis have a similar anatomic distribution and tendency to present as a mass lesion overlying or adherent to tendon. However, extraskelatal chondromas tend to form a well-demarcated solitary mass, and have a somewhat younger age distribution with 58% of cases occurring between the ages of 10 and 39 years [5]. Marginal surgical excision is usually the treatment of choice with preservation of adjacent bone and soft tissue structures. Local recurrence is not rare despite the benign nature of the lesion with a rate between 15% and 25% [1]. Recurrent tumors are best treated with re-excision [5].

4. Conclusions

In conclusion, soft tissue chondroma is a very rare benign tumor most commonly affecting the extremities like hands and feet. In our cases, the tumor was localized at atypical sites (thigh and the right iliac fossa). It has a slowly progressive benign course, rarely exceeding 2 cm in diameter. These cases may also be considered as a typical and noteworthy due to the diameter exceeding 10 cm and 50 cm. Soft tissue chondroma can be misdiagnosed as a malignant tumor, but we must think to this lesion in the presence the following characteristic features:

- 1) Benign clinical course.
- 2) Not attached to the underlying bone.
- 3) Slow growth.
- 4) The absence of age and sex predominance.
- 5) The histological picture.

Consent from the Patient

Written informed consent was obtained from patients for publication of this case report.

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