

Periarticular soft tissue chondroma around the knee and shoulder joint – report of 2 cases

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Abstract— Soft tissue chondroma is a rare benign cartilaginous tumor with a typical localization in the hands and feet. The periarticular development of the tumor, combined with its non-specific radiographic manifestation, can lead to serious diagnostic difficulties. We present 2 clinical cases of periarticular soft tissue chondroma, diagnosed and treated in our clinic within the last 2 months.

Keywords— soft tissue tumors, chondroma, periarticular

1. Introduction

Soft tissue chondroma (STC) is a benign cartilaginous tumor that develops in soft tissues without any connection to bone or periosteum. The tumor is relatively rare with a frequency of about 1.5% of all soft tissue tumors, in contrast to conventional chondroma, which is the most common benign primary bone tumor^{1,9}. STC is prevalent in patients between 30-60 years of age, with typical localization of hands and feet^{2,9}. The periarticular location of the tumor is much rarer, especially around the shoulder and knee^{4,8,10,11}.

We present 2 clinical cases of soft tissue chondroma with localization around the knee and shoulder joint, treated in our clinic within the last 2 months. The aim of the article is to expand the differential diagnosis of soft tissue tumors found in these areas.

2. Clinical case № 1

In January 2022 a 19-year-old girl with complaints of a slowly growing formation in the right axillary fossa which she noticed 6 months ago, was admitted in our clinic at the University Orthopedic Hospital Boycho Boychev. Clinical examination revealed a well-defined, oval formation with a dense consistency, which was painless on palpation and immobile. The diameter of the lesion was about 10 cm. Peripheral vascular and neurological status of the right upper limb was normal. Restrictions in the volume of movements of the right shoulder joint were also established, mostly at the expense of adduction and internal rotation.

Conventional radiographs showed predominantly radiolucent formation with the presence of numerous annular and punctate calcifications in the right axillary fossa

(Fig.1). MRI was also performed which showed a well demarcated mostly homogeneous formation with low to medium intensity on T1 and T2 sequence relative to the skeletal musculature, adjacent to the anterior-inferior part of the joint capsule of the shoulder joint, without any connection with it.

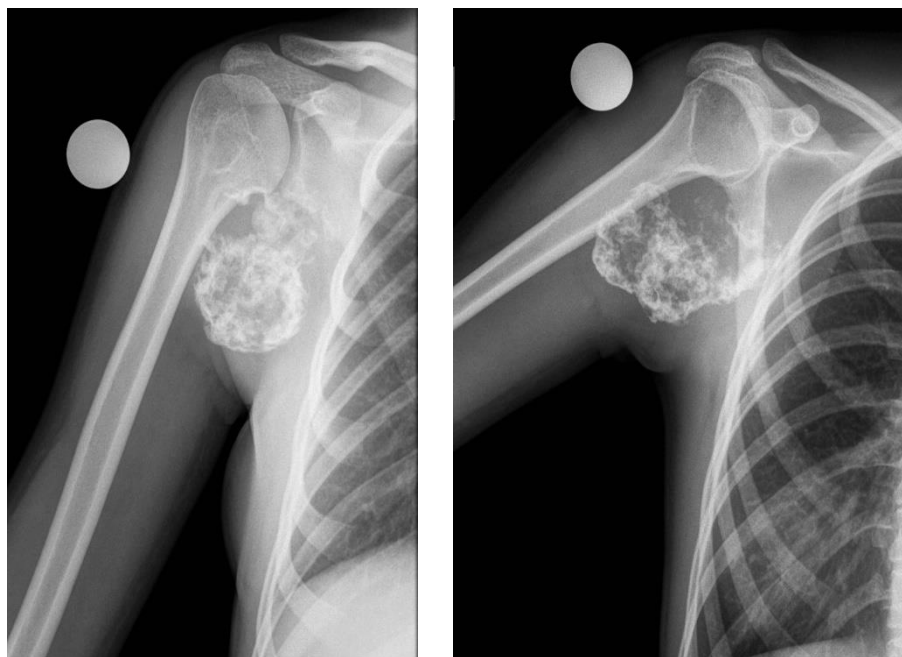


Figure. 1 - Conventional radiography revealed a calcified oval-shaped formation located in the right axillary fossa

Next an open biopsy was performed, after which a histological diagnosis of atypical chondroma was made. Due to the size of the formation and its location, a decision was made for definitive surgical treatment. Marginal excision of the formation was performed by axillary approach. Intraoperatively it was confirmed that the formation was adherent tightly to the anterior-inferior part of the joint capsule of the shoulder joint (Fig.2). A vascular surgeon was also involved in the operative team, as the main vascular bundle of the upper limb rested on the formation. The patient had a smooth post-operative period, without impaired neurological function of the limb, a normal range of movement and stability of the affected joint.



Figure 2. - Intraoperative photographs of the excised tumor formation and the operative wound, at the bottom of which the vascular-nervous bundle of the area can be seen.

3. Clinical case № 2

A 26-year-old patient was admitted in our clinic in February 2022, with complaints of a slowly growing formation around the left knee joint, which appeared more than 3 years ago. As the lesion got bigger the movements in the affected joint were severely restricted, which led to a violation in the gait. The clinical examination revealed an oval formation with a diameter of about 5 cm dense consistency, which was painless on palpation and immovable.

Conventional radiographs in several projections, showed a soft tissue formation in the right axillary area with the presence of numerous ring-like calcifications (Fig.3). No change in the bone structure of the underlying scapula or the presence of a periosteal reaction was found. The patient was additionally assigned an MRI, which showed a well-defined predominantly homogeneous, periarticular formation with an intermediate intensity of T1 and T2 signal (Fig.4). The definitive diagnosis of soft tissue chondroma was made after an open biopsy.

4. Discussion:

As a benign tumor, STC has slow and expansive growth. It is strongly implied that the tumor originates from the fibrous stroma of the soft tissues, without any connection with the mature bone and cartilage structures^{2,8,9,11}. As was already mentioned, more than 82% of lesions are found in the hands and feet⁹. Very rarely, STC grows larger than 3 cm in diameter^{2,9}. In our series, the smallest excised formation was 5 cm in diameter and the largest 10 cm in diameter. The clinical presentation of STC was mainly composed of the presence of slow-growing soft tissue mass, rarely causing local discomfort or pain^{2,3,4,5,6,8,9,10,11,13}.

When the tumor is located periarticularly, patients often report a limitation in the range of motion of the affected joint. In our patient with localization of STC around the



Figure 3. - On the posterior-medial surface of the left knee joint a soft tissue formation with the presence of cloudy and annular calcifications was noted

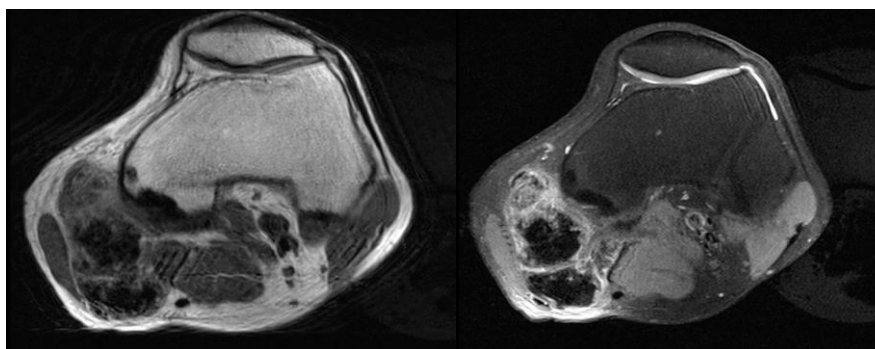


Figure 4. - MRI of the left knee joint showing predominantly homogeneous, lobulated formation with moderately increased intensity relative to skeletal musculature

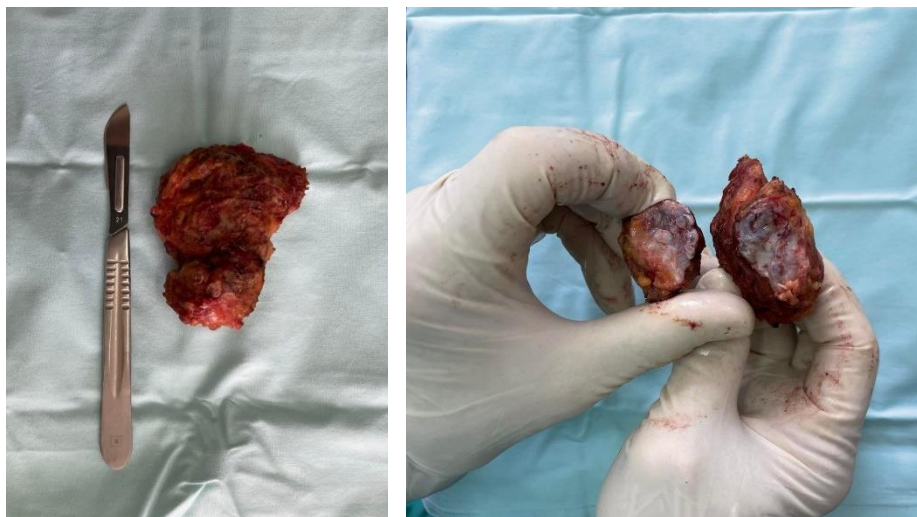


Figure 5. - Intraoperative images of the tumor after excision

shoulder joint, a restriction in adduction and internal rotation was found, and in the patient with involvement of the knee joint - a restriction in flexion.

Unfortunately, the image-diagnostic characteristic of STC is nonspecific. Conventional radiographs most often reveal mostly a radiolucent formation with centrally located annular calcifications, which are characteristic of cartilaginous tumors^{2,5,9}. Calcifications are an almost constant finding in STC and are present in 33 to 70% of cases. CT can confirm the extraosseous location of the tumor, which may aid in the differential diagnosis. On MRI, the tumor presents as a well-defined, lobulated lesion with low to medium signal intensity of T1 and T2 sequence^{2,5,9}. The lack of specific clinical and imaging characteristics requires a biopsy in all cases, due to the inability to rule out a malignant tumor. Marginal surgical excision is sufficient for the definitive treatment of STC. The tumor may recur, with a frequency between 15-25% reported in the literature⁹.

The differential diagnosis of periarticular STC in the shoulder and knee joint is broad. First the tumor must be distinguished from some of the malignant soft tissue tumors that can be found in these areas, such as extraosseous chondro- and osteosarcoma, synovial sarcoma and angiosarcoma^{1,12}. In most cases, patients are aware of the presence of the formation for many years, which in combination with the scarce clinical symptoms supports the benign biology of the tumor. Conventional radiography and CT do not provide enough specific information and can hardly contribute to a correct diagnosis. When it comes to soft tissue tumors, MRI provides the most sensitive and specific information about the infiltration and destruction of adjacent to the lesion structures, properties that STC does not present with. However, the diagnostic process almost always ends with a biopsy, and when it is an open biopsy in most cases macroscopically, the sarcomatous structure of the tumor can be easily identified. Differential diagnosis

should also be made with myositis ossificans, a benign disease that is a normal process of tissue regeneration after trauma that is out of control¹³. The radiographic changes in ossifying myositis are divided in stages and are zonal in nature. In the final stages of the disease the already mature ossification may merge with the adjacent bone¹³. It is possible to make a mistake in the diagnosis during histological examination in the early stages of the development of ossifying myositis, due to the large amount of immature cartilage tissue^{1,13}. Another disease that is worth mentioning in the differential diagnosis is synovial chondromatosis. It is characterized by metaplasia of the synovium of the joints and tendons in cartilage tissue, which at a later stage separates in the form of loose bodies⁷. The main difference here is mainly the intra-articular location of the synovial chondromatosis and the completely extrasynovial development of STC, which can be confirmed by MRI and histological examination.

5. Conclusion:

Soft tissue chondroma should be present in the differential diagnosis when discussing soft tissue periarticular formations around large joints, despite its rarity.

6. References

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