World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

Soft-tissue osteochondroma of the elbow: A case report

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World Journal of Advanced Research and Reviews, 2026, 29(03), 1809-1814

Publication history: Received on 30 November 2025; revised on 05 January 2026; accepted on 07 January 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.29.3.0037

Abstract

Extraskeletal osteochondromas (ESCs) are rare benign tumors distinguished from conventional osteochondromas by their discontinuity from underlying bone. Their diagnosis can be challenging due to nonspecific clinical and radiological findings, as well as the need to exclude more aggressive soft-tissue tumors, particularly sarcomas. Imaging modalities, including conventional radiographs, CT, and MRI, play a critical role in diagnosis and provide complementary, valuable features.

We report a case of an eighteen-year-old male presenting with a five-year history of slow-growing swelling on the lateral aspect of the right elbow, treated with surgical excision. We discuss the clinical, radiological, and histopathological features of the mass, which was confirmed as a soft-tissue osteochondroma by histopathological analysis of the surgical specimen. We aim to underscore the importance of considering ESCs in the differential diagnosis of ossified soft-tissue masses in young patients.

Keywords: Extraskeletal osteochondroma; Osteochondroma; Cartilaginous matrix; Elbow joint

1. Introduction

Extra-skeletal soft tissue osteochondroma, or para-articular osteochondroma, is a sporadic, slow-progressing benign tumor. Its diagnosis may be challenging, as the clinical and radiological findings often overlap with other, more aggressive soft tissue tumors. The recognition of this entity is essential to avoid overtreatment.

Here, we present a case of histopathologically proven soft-tissue osteochondroma of the elbow joint, along with clinical and radiologic findings.

2. Case report

We present a case of an eighteen-year-old male who presented to the orthopedic department with a slow-developing swelling of the right elbow persisting for five years, accompanied by restricted joint motion and intermittent pain. There was no history of trauma, fever, joint effusion, or swelling in other joints. Clinical examination revealed a spherical-shaped, hard, non-adherent, and non-tender swelling on the lateral aspect of the right elbow. The swelling became more pronounced during wrist flexion, with wrist extension limited to 50° (normal: 0°–70°).

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The swelling was particularly prominent in flexion, with a slight impairment of wrist extension of 10 °- 20 °. No signs of inflammation were observed. Sensation, muscle force, and peripheral nerve testing were normal.

Plain X-ray revealed a well-demarcated soft tissue mass along the lateral aspect of the elbow, with dense inhomogeneous calcification, well-defined curvilinear calcified border (figure 1). The mass was entirely extra-articular, with no apparent bone continuity on the lateral views. There was no bone erosion or periosteal reaction. The structure and mineralization of the bones were normal.

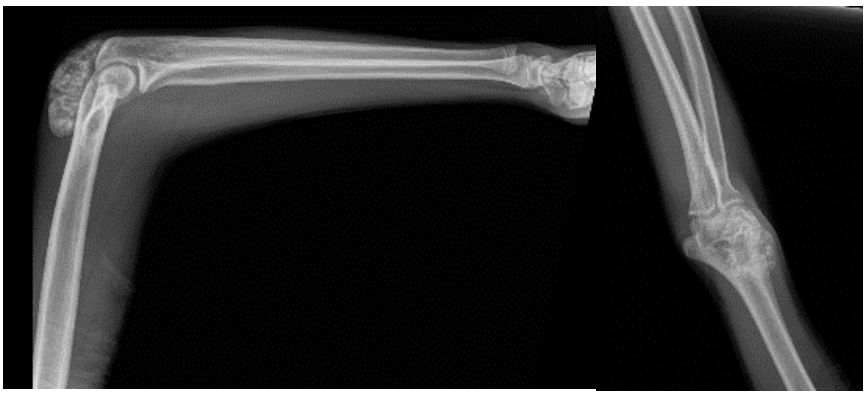

Figure 1 Plain radiographs show a well-demarcated soft tissue mass along the lateral aspect of the elbow, with dense inhomogeneous calcification and a well-defined curvilinear calcified border. Note the absence of any apparent connection between the tumor and the bones on the lateral views, bone erosion or periosteal reaction

An MRI of the elbow was then performed before and after IV contrast administration to improve characterization (Figures 2 and 3). It revealed a well-circumscribed soft tissue mass along the lateral aspect of the elbow, abutting the proximal radius and ulna, with a lobulated surface and no evidence of continuity to the adjacent bones. The mass displaced the triceps brachii muscle, with mild edematous infiltration of the latter. It showed low heterogeneous signal on T1 images and high heterogeneous signal on T2 STIR images, with ring-like calcifications (low signal intensity on T1- and T2-weighted images), a central intralesional high signal on T2, and heterogeneous enhancement after contrast administration, suggesting a cartilaginous matrix. The periosteum of the bones was intact. No imaging feature suggestive of malignant transformation was identified.

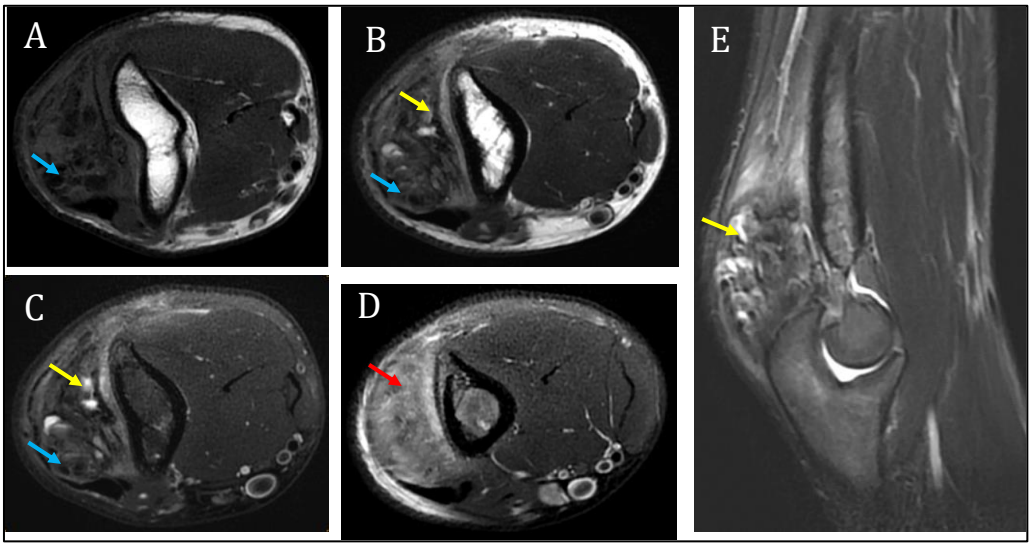

Figure 2 Right elbow MRI: Axial T1 (A); Axial (B, C, D) and Sagittal (E) T2 Short Tau Inversion Recovery (STIR): Well-demarcated extraosseous soft tissue mass along the lateral aspect of the elbow, abutting the proximal radius and ulna, with heterogeneous intensity, showing ring-like calcifications (low signal intensity on T1- and T2- weighted images, blue arrows). There is a central intralesional high signal on T2 related to chondral matrix (yellow arrow). Note the absence of continuity of the mass with bone structures. There is T2 intermediate high-intensity among the triceps brachii muscle, consisting of oedema (red arrow)

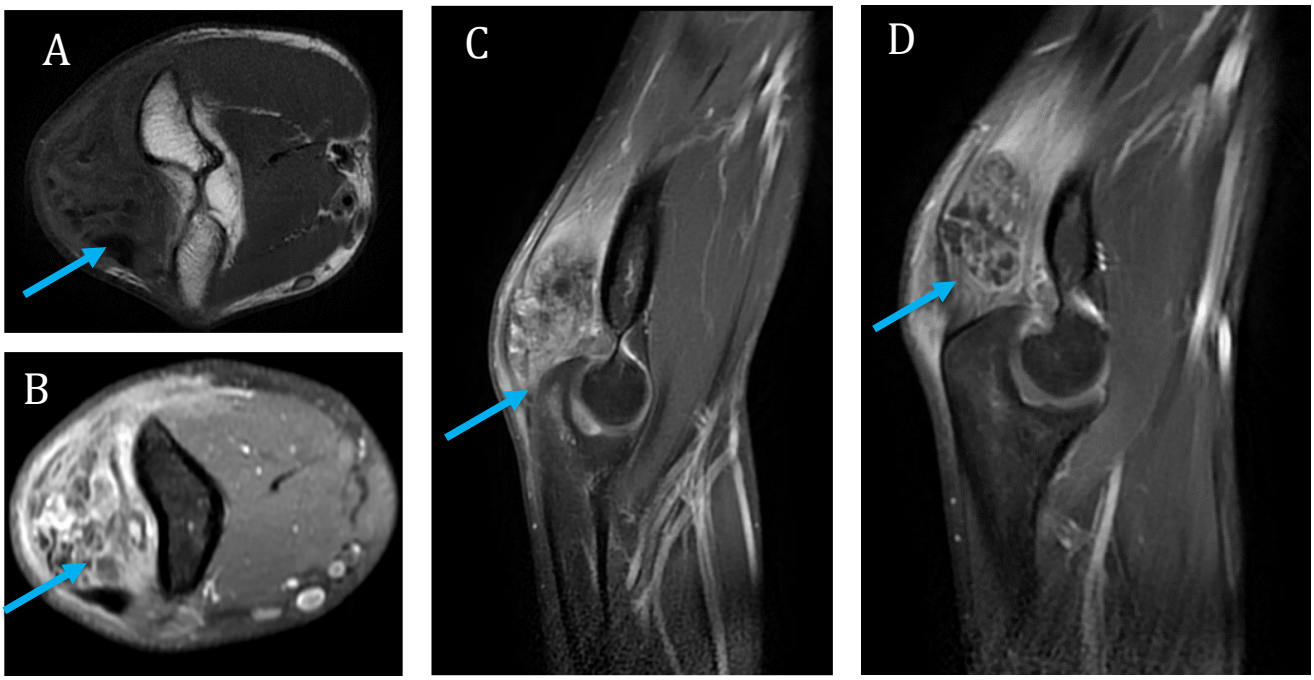

Figure 3 Right elbow MRI: Axial T1 (A); Axial (B) and Sagittal (C, D) T1 fat-saturated contrast MRI showing heterogeneous contrast enhancement of the soft-tissue elbow mass

Surgical resection of the mass was indicated because of the functional impairment. The histopathological examination showed cortical and trabecular bone fragments covered by mature cartilaginous fragments, confirming the diagnosis of patellar osteochondroma, without signs of malignant transformation. The patient responded to excision and was relieved of all symptoms. At six months follow-up, the patient regained normal elbow function without neurovascular complications and showed no clinical or radiographic evidence of recurrence.

3. Discussion

Conventional osteochondroma is the most common primary bone tumor. It is a bone exostosis in which a continuous cortical layer projects from the underlying bone and is covered by cartilaginous tissue [1]. Extraskeletal osteochondromas (ESCs) are a distinct and uncommon entity, characterized by their discontinuity from the underlying bone, with multiple postulated theories of origin. Most of these arise from the synovium, with the majority located in the hands, followed by the feet. They have also been reported in various limb tissues, as well as in unusual localizations such as the kidney, liver, tongue, and posterior neck [2].

ESCs are very slow-progressing tumors, typically occurring between 30 and 60 years of age, with equal sex predilection [3]. They produce no striking or characteristic clinical manifestations, which may suggest several differential diagnoses. The most common clinical complaints among patients include local discomfort, moderate pain, a slowly enlarging mass, tenderness or pain, and some degree of limited joint motion [1]. Our patient expressed these same complaints. There are also rare reports of ESCs causing neurogenic compression [4] or bone compression deformity [5].

Radiographic findings of ESCs include a well-demarcated extraosseous soft-tissue mass near a joint, typically with calcifications. The appearance of these calcifications is variable, potentially curvilinear, punctate, amorphous, or ring-like, with the latter being more characteristic of a cartilaginous matrix [6, 7]. Less common findings include ossification within the matrix, bone erosion, or sclerosis [7]. CT does not provide significant additional information beyond conventional X-ray; however, calcifications may be better demonstrated with CT. Our patient did not undergo CT examination, as the calcifications within the mass were adequately characterized on plain radiographs. MR imaging is considered the imaging method of choice for diagnosis and local staging of musculoskeletal soft-tissue masses. It is more specific than plain radiographs in assessing the tumor matrix and margins, as well as its relationship to the bone, muscular fascia, and neurovascular bundle. MRI better delineates the mass border, an important criterion to distinguish it from a sarcoma, and demonstrates the absence of osseous continuity with the underlying bone. The characteristic MRI appearance of soft tissue chondroma is a well-demarcated lobulated mass showing low- to intermediate signal intensity relative to muscle on T1-weighted images, and a mixture of intermediate-to-high signals in the cartilaginous areas on

T2-weighted images. An intermediate T2 signal intensity is observed in areas of mature ossification, except in densely calcified regions, which exhibit low signal intensity. Various patterns of enhancement may be observed following IV administration of contrast medium [8].

The diagnosis of soft-tissue chondroma is based on histological examination. The histopathologic appearance of this neoplasm varies, ranging from an immature pattern dominated by chondroblasts to a mature profile with chondrocytes [9]. Some tumors may exhibit atypical features due to their cellularity and the immature appearance of tumor cells, which could mislead the pathologist into a malignant interpretation. These features underscore the importance of the correlation among the clinical, radiological, and cytological triad for ensuring prompt diagnosis [7]. Reith et al. defined three diagnostic criteria for soft-tissue osteochondroma, including: radiologic or clinical detection of a single lesion, bone and cartilaginous histologic composition, and presentation as an extra-synovial lesion [10].

The main differential diagnoses, such as myositis ossificans, synovial osteochondromatosis, tenosynovial giant cell tumors, ossifying fibromyxoid tumor, tumoral calcinosis, synovial chondromatosis, synovial sarcoma, periosteal chondrosarcoma, and extraskeletal osteosarcoma, should be considered for discrete soft tissue masses with mature ossification. Most importantly, attention should be directed toward identifying malignant features suggestive of sarcomatous origin, including irregular contours, bone fixation, bone destruction, an aggressive periosteal reaction, and synovial extension. However, the elbow is involved in fewer than 1% of cases of soft-tissue sarcomas of the upper extremity [11].

MRI of the elbow is the diagnostic method of choice, but biopsy is always required as a confirmatory test when malignancy is suspected. Benign soft-tissue tumors are approximately 10 times more common at this location than malignant tumors [11]. The imaging characteristics, correlated with clinical and histological features, allow the distinction (Table 1). The clinicopathological and radiological features of our case excluded these lesions.

Table 1 Differential diagnosis of extraskeletal osteochondroma

Diagnosis	**Number of lesions**	**Location**	**Radiographic features**	**Histopathology**
Myositis ossificans	Solitary	Away from joint	Circumferential calcification with a lucent center and a radiolucent cleft (egg-shell calcifications) that separates the lesion from the cortex of the adjacent bone [13].	Zonal organization, consisting of peripheral, well-organized mature lamellar bone, intermediate osteoid region and central immature non-ossified cellular focus [14].
Tumoral calcinosis	Solitary/ Multiple	Away from joint	Amorphous and multilobulated ("cloud-like") calcification located in a periarticular distribution.	Large amorphous calcifications that surround joints, separated into lobules by fibrous septa, May demonstrate fluid/calcium levels [15]
Synovial chondromatosis	Multiple	Involves joint/near the joint [1] (subsynovial tissue of a joint, tendon sheath, or bursa)	Multiple intraarticular calcifications of similar size and shape, distributed throughout the joint, with typical "ring-and-arc" chondroid mineralization, known as loose bodies [16].	Hyperplastic synovium covering bluish white, multilobulated, nodular projections of hyaline cartilage diffusely involving the entire joint surface +/- calcifications [1][16].
Periosteal chondrosarcoma	Solitary	On the surface of bone, away from joint [1]	Juxtacortical mass with lobulated margins. Altered underlying bony cortex (can be thinned or thickened) [17]	Increased cellularity and atypia of chondrocytes [18]

Synovial sarcoma	Solitary	Deep soft tissues adjacent to large joints	Soft tissue mass near but not in a joint, with dystrophic calcification [19]	Biphasic tumor composed of epithelial and spindle shaped cells along with calcification [18][1]

The treatment of choice - and the only successful one - for all ESCs is radical surgical excision, with preservation of adjacent bone and soft tissue structures. Recurrence is not uncommon, with reported rates up to 18% [12], and such recurrence is best managed with re-excision.

4. Conclusion

ESCs are rare pathologic entities that should be considered when a discrete, ossified mass is localized in the soft tissues of the distal extremities. Differential diagnosis should encompass a wide variety of other pathologic conditions. Imaging is fundamental for diagnosis and surgical planning. However, radiographic findings may be misleading, underscoring the importance of integrating clinical, radiologic, and pathologic findings to ensure prompt diagnosis. Marginal excision is the recommended treatment of choice for all ESCs, with a significant rate of local recurrence.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] « KANWAT, Manish, JANGIRA, Vivek, SHARMA, Bhavna, et al. Can an exostosis be free floating without any continuity to the underlying bone: a diagnostic dilemma. Journal of clinical orthopaedics and trauma, 2017, vol. 8, p. S87-S89. »

[2] « NARULA, R., ARYA, A., VERMA, L. R., et al. Soft tissue osteochondroma in elbow joint: a case report. Malaysian Orthopaedic Journal, 2012, vol. 6, no 1, p. 53. »

[3] « WATANABE, Futoshi, SAIKI, Tadahiko, et OCHOCHI, Yoshihisa. Extraskeletal chondroma of the preauricular region: a case report and literature review. Case Reports in Medicine, 2012, vol. 2012, no 1, p. 121743. »

[4] « DE SMET, Luc. Posterior interosseous neuropathy due to compression by a soft tissue chondroma of the elbow. Acta neurologica belgica, 2005, vol. 105, no 2, p. 86. »

[5] « CHUNG, E. B. et ENZINGER, Franz M. Chondroma of soft parts. Cancer, 1978, vol. 41, no 4, p. 1414-1424. »

[6] « Fnini, S., Sennoune, B., Zamiati, S., Ouarab, M., Largab, A., & Trafeh, M. (2004). Soft-tissue chondroma of the hand. A new case. Chirurgie de la Main, 23(3), 153-156. »

[7] « BAHNASSY, Moosa et ABDUL-KHALIK, Hala. Soft tissue chondroma: a case report and literature review. Oman medical journal, 2009, vol. 24, no 4, p. 296. »

[8] « ENZINGER, F. M. Cartilaginous tumors and tumor-like lesions of soft tissue. Soft-tissue tumors, 1988, p. 861-881. »

[9] « WOERTLER, Klaus, BLASIUS, Sebastian, BRINKSCHMIDT, Christian, et al. Periosteal chondroma: MR characteristics. Journal of computer assisted tomography, 2001, vol. 25, no 3, p. 425-430. »

[10] ZLATKIN, M. B., LANDER, Philip H., BEGIN, Louis R., et al. Soft-tissue chondromas. American journal of roentgenology, 1985, vol. 144, no 6, p. 1263-1267. »

[11] REITH, John D., BAUER, Thomas W., et JOYCE, Michael J. Paraarticular Osteochondroma of the Knee; Report of 2 Cases and Review of the Literature. Clinical Orthopaedics and Related Research (1976-2007), 1997, vol. 334, p. 225-232. »

[12] SAVVIDOU, Olga D., KOUTSOURADIS, Panagiotis, BOLIA, Ioanna K., et al. Soft tissue tumours of the elbow: current concepts. EFORT Open Reviews, 2019, vol. 4, no 12, p. 668-677. »

[13] LACOUT, Alexis, JARRAYA, Mohamed, MARCY, Pierre-Yves, et al. Myositis ossificans imaging: keys to successful diagnosis. Indian journal of radiology and imaging, 2012, vol. 22, no 01, p. 35-39. »

[14] KRANSDORF, M. J. et MEIS, J. M. From the archives of the AFIP. Extraskeletal osseous and cartilaginous tumors of the extremities. Radiographics, 1993, vol. 13, no 4, p. 853-884. »

[15] LARSSON, Tobias, DAVIS, Siobhan I., GARRINGER, Holly J., et al. Fibroblast growth factor-23 mutants causing familial tumoral calcinosis are differentially processed. Endocrinology, 2005, vol. 146, no 9, p. 3883-3891. »

[16] MURPHEY, Mark D., VIDAL, Jorge A., FANBURG-SMITH, Julie C., et al. Imaging of synovial chondromatosis with radiologic-pathologic correlation. Radiographics, 2007, vol. 27, no 5, p. 1465-1488. »

[17] NAKAGAWA, Makoto, ENDO, Makoto, SUSUKI, Yosuke, et al. Clinical, radiological, and histopathological characteristics of Periosteal Chondrosarcoma with a focus on the frequency of Medullary Invasion. Journal of Clinical Medicine, 2022, vol. 11, no 7, p. 2062. »

[18] RATCLIFF, J. Robyn, NAQVI, Asghar, DE LA ROZA, Gustavo, et al. Soft tissue osteochondroma: case report and immunohistochemistry for parathyroid hormone–related protein. Annals of Diagnostic Pathology, 2006, vol. 10, no 4, p. 222-229. »

[19] O'SULLIVAN, P. J., HARRIS, A. C., et MUNK, P. L. Radiological features of synovial cell sarcoma. The British journal of radiology, 2008, vol. 81, no 964, p. 346-356. »

[20] KHO, Victor Ka-Siong et CHEN, Wen-Chih. Extraskeletal osteochondroma of the foot. Journal of the Chinese Medical Association, 2010, vol. 73, no 1, p. 52-55. »