Radiology Case Reports 18 (2023) 2637–2640

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

# Recurrent chondroblastoma of the acetabulum in an adult ☆

*Christopher Lan, BS*[a,*], *Cyrus Bateni, MD*[b], *Raminta Theriault, MD*[c], *Michelle Scott, MD*[c], *Robert Lawrence Randall, MD*[c], *Jasjeet Bindra, MD*[b]

[a] *School of Medicine, University of California, Davis, 4610 X St, Sacramento, CA 95817, USA*
[b] *Department of Radiology, University of California Davis School of Medicine, 4860 Y St. Suite 3100 Sacramento, CA 95817, USA*
[c] *Department of Orthopaedic Surgery, University of California Davis School of Medicine, 4860 Y St. Suite 3800 Sacramento, CA 95817, USA*

ARTICLE INFO

*Article history:*
Received 19 March 2023
Revised 22 April 2023
Accepted 27 April 2023

*Keywords:*
Chondroblastoma
Acetabulum
Recurrent
Musculoskeletal
Pelvis

ABSTRACT

Chondroblastoma is a rare, benign neoplasm of chondroblast cell origin, accounting for less than 1% of primary bone tumors. It is usually diagnosed in the second decade of life with most of the cases involving the long bones such as the femur and humerus. Furthermore, over 90% of cases are in individuals under 30 years of age. In older adults, chondroblastomas are typically found in bones in the foot, such as the talus and calcaneus. Treatment is usually local curettage of the lesion with a relatively low rate of recurrence. In this case report, we present a patient with an atypical age of initial presentation at 49 years, a rare location of the chondroblastoma in the acetabulum, and a recurrence 14 years after surgical resection in the same location. The lesion's radiographic findings of intralesional calcifications alongside the high-signal, heterogeneous composition on T2-weighted MRI were supportive of the atypical diagnosis of chondroblastoma in this patient.



## Introduction

Chondroblastoma is a rare, benign neoplasm of chondroblasts, accounting for less than 1% of primary bone tumors [1]. It is usually diagnosed in the second decade of life with over 80% of the cases involving the long bones such as the femur and humerus, and about 90% of cases are in individuals under 30 years of age [2,3]. Typically, chondroblastoma involves the epiphyses of the long bones; however, in adults, these tumors more commonly involve the flat and short tubular bones of the foot, especially the talus and calcaneus. The most common presenting symptom is pain, which can be accompanied by interference with joint function. Surgery is the mainstay of treatment for chondroblastoma with most patients remaining disease-free after resection. However, there is a substan-

☆ Competing Interests: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

* Corresponding author.
E-mail address: lanchristopher@outlook.com (C. Lan).

https://doi.org/10.1016/j.radcr.2023.04.049

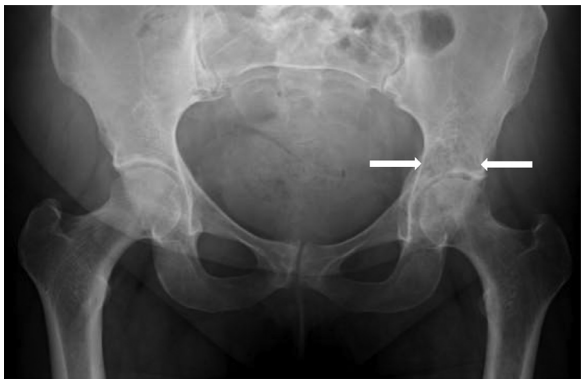

**Fig. 1 – Frontal pelvic radiograph from initial presentation in 2008 demonstrating a primarily lucent, but mixed lytic and sclerotic lesion with internal mineralization involving the left acetabulum (white arrows).**

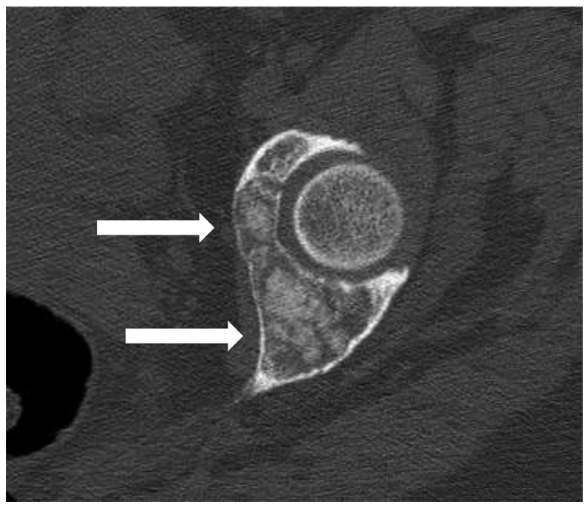

**Fig. 2 – Axial noncontrast CT image of the left acetabulum in bone window soon after initial presentation demonstrating a 5.1 × 4.8 cm mixed lytic and sclerotic lesion (white arrows) with internal matrix calcification.**

tial rate of recurrence that varies between 8% and 35% [4]. In this case report, we describe a patient with an atypical age of initial presentation at 49 years, a rare location of chondroblastoma in the acetabulum, and a recurrence 14 years after surgical resection in the same location.

## Case report

A 49-year-old woman first presented to the spine clinic for chronic back pain radiating to the left lower extremity. She reported that her low back pain had progressively worsened over 2 years prior to initial presentation. Her pain also radiated down the left L5 and S1 distribution with intermittent numbness and tingling sensation. On physical exam, she also had a limp.

Imaging of the spine and pelvis were performed in 2008 based upon the patient's symptoms and a pelvic radiograph showed a lucent lesion of the left acetabulum with internal mineralization (Fig. 1). Because of the lesion, she underwent MRI of the pelvis which showed a 6 × 3 × 5 cm expansile lesion in the left acetabulum. A subsequent CT scan showed the lytic expansile lesion within the left acetabulum with internal amorphous mineralization (Fig. 2).

Based upon the imaging, several diagnostic possibilities were considered, including fibrous dysplasia, chondrosarcoma, or metastasis. Therefore, the patient was referred to orthopedic oncology and an intraoperative biopsy of the pelvic lesion was performed 2 months after the initial MRI. The tissue was analyzed by both our university pathologists and outside pathologists specialized in bone and soft tissue, who interpreted the lesion as showing epithelioid to spindle cells with abundant eosinophilic cytoplasm, chicken-wire calcifications, and giant cells consistent with chondroblastoma. She underwent curettage, and after the surgery, she had significant improvement in her pain and ability to ambulate. The patient was followed by orthopedics and remained asymptomatic, though she did unfortunately suffer a distal left femur fracture in December of 2009 after a fall. After several years, she returned to routine follow up with her primary care physician without orthopedic follow up.

However, she presented again in February 2022 to the emergency department for acute flank pain, concerning for nephrolithiasis. A CT abdomen and pelvis at the time confirmed nephrolithiasis but incidentally found an expansile lesion involving the left acetabulum, expanding medially into the left pelvic side wall and involving the superomedial acetabular cortex (Fig. 3). The lesion showed internal mineralization, similar to the prior tumor. The patient was again referred to orthopedic oncology, who evaluated her and noted that she has had increasing pain at her left hip, with physical exam suggesting her symptoms may be related to intra-articular pathology.

An MRI pelvis was performed in April 2022, which showed a 5.1 × 5.3 × 5 cm left acetabular lesion, at the same location of her initial chondroblastoma (Fig. 4). The same month, she underwent a CT-guided core biopsy of the lesion. The pathology results showed that the lesion was recurrent chondroblastoma.

The patient continued to have debilitating pain with activities of daily living and elected to undergo further treatment. Given she had previously failed curettage and grafting of the lesion and the extent of the lesion in the acetabulum on CT and MRI, a complex reconstruction with custom implants was planned. A surgical planning platform was used to plan both the resection and the custom acetabular implant. A utilitarian approach to the pelvis was performed with both anterior and posterior exposure of the acetabulum. The lesion was resected en bloc and a total hip arthroplasty with custom acetabular implant was placed (Fig. 5). Pathology of the specimen demonstrated complete resection of the lesion with clear margins.

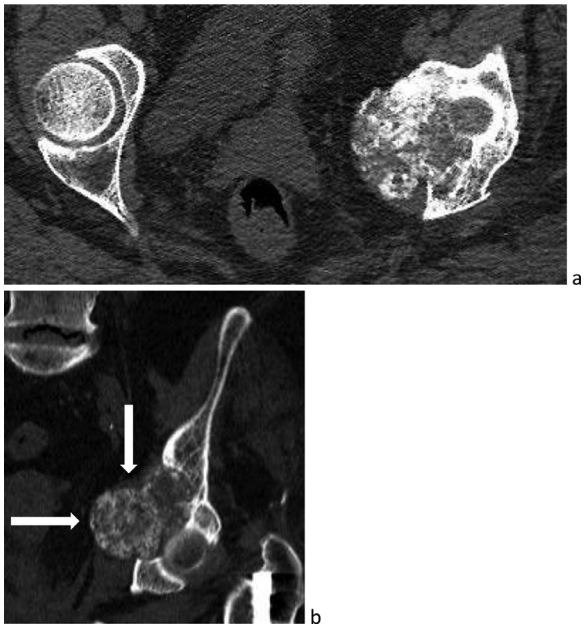

**Fig. 3 – Axial (A) and coronal (B) images in soft tissue and bone window, respectively, from a noncontrast CT scan of the pelvis at the level of the acetabulum from 2022, shortly after the patient was found to have biopsy-proven recurrent disease.**

## Discussion

Chondroblastoma is a rare benign tumor of immature cartilage cells that generally occurs in an epiphyseal location of skeletally immature individuals. A few studies have reported cases in older patients [3,5]. In adults, most lesions occur in the short bones of the hands and feet. Chondroblastoma is usually diagnosed at an average age of 19-23 years with a male predominance of 2:1 [1]. The patient in this case report presented at the age of 49 with an initial diagnosis of chondroblastoma. Furthermore, our patient did not have the typical location of a chondroblastoma in an older adult reported in other studies. The pelvic acetabulum is a very atypical location for a chondroblastoma at any age. From a literature review, there have been few case reports of chondroblastoma in the acetabulum. One was a 60-year-old male patient published in 1991 [6].

Radiographic and CT findings (Figs. 1 and 2) showed the intralesional calcifications which can be seen in chondroid lesions. However, given the age of the patient and pelvic location, chondrosarcoma, fibrous dysplasia and a metastatic lesion were also in the differential diagnosis based on radiologic evaluation. Chondrosarcoma is the most common primary sarcoma of bone in adults and is most seen in the pelvis or long bones as a lytic lesion with internal calcifications. This lesion had central mineralizations, though not the typical "ring and arc" calcifications seen in chondroid lesions. Fibrous dysplasia was another consideration as it is classically intramedullary, lytic, expansile and can be seen in pelvis. The hazy mineralizations in the initial lesion of this case appeared more ground-glass as seen in fibrous dysplasia. Metastatic lesions are also an important differential for neoplastic lesions of the pelvis, especially in older patients. The pelvis is the second most common location for osseous metastases following the vertebrae. Intratumoral mineralizations can be seen in some metastatic lesions such as from certain mucinous adenocarcinomas. However, metastatic lesions often have a less homogenous density. Furthermore, our patient had no known primary malignancy and no other sites of neoplastic involvement. MRI imaging of chondroblastoma can vary depending on the histopathologic composition of the tumor [7]. The chondroblastoma we present showed the classic high-signal, heterogeneous composition on T2-weighted imaging. While MRI cannot always provide a definitive diagnosis, it is valuable in evaluating the extent of disease, guiding biopsy to avoid necrotic tissue, planning surgery, and assessing response to therapy. Post-therapeutic follow up can also be performed with MRI. [8]

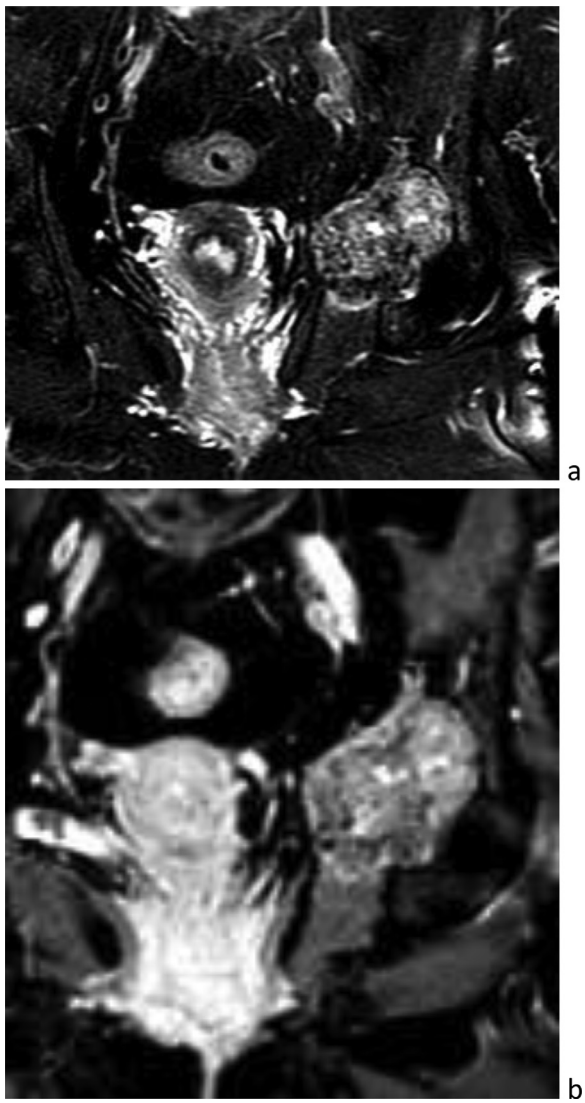

**Fig. 4 – A and B: Coronal precontrast T2 fat saturated (A) and postcontrast T1 fat saturation MRI (B) in April 2022 demonstrating 5.3 x 5 cm left acetabular lesion, extending into the medial pelvic side wall, similar in location to the initial chondroblastoma.**

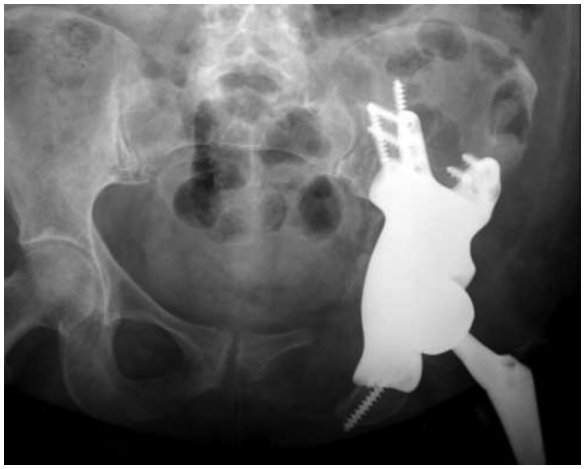

**Fig. 5 – Postoperative frontal radiograph after left pelvic mass excision and left hip arthroplasty with custom acetabular reconstruction.**

The recommended treatment is extended intralesional curettage and filling the defect with graft [9]. Local adjuvants including burring, liquid nitrogen, phenol and cement are also useful if incomplete curettage is achieved to protect the adjacent physis or joint cartilage. Despite local curettage, this patient's chondroblastoma recurred after 14 years in the same location of the left acetabulum. A retrospective cohort study of 82 patients showed that chondroblastomas involving the pelvis tend to be biologically more aggressive and have a higher rate of recurrence [10]. While the total number of pelvic chondroblastomas reported in the literature are rare, this case report supports the study's discussion that chondroblastomas in the pelvis are more likely to recur.

## Patient consent

Patient consent to publish her medical record pertinent to this case report has been obtained both verbally and documented through DocuSign. We may provide legal proof of this consent if requested by any authority or Radiology Case Reports.

## REFERENCES


[1] Chen W, DiFrancesco LM. Chondroblastoma: an update. Arch Pathol Lab Med 2017;141(6):867–71. doi:10.5858/arpa.2016-0281-RS.

[2] Bloem JL, Mulder JD. Chondroblastoma: a clinical and radiological study of 104 cases. Skeletal Radiol 1985;14(1):1–9. doi:10.1007/BF00361187.

[3] Angelini A, Hassani M, Mavrogenis AF, Trovarelli G, Romagnoli C, Berizzi A, et al. Chondroblastoma in adult age. Eur J Orthop Surg Traumatol 2017;27(6):843–9. doi:10.1007/s00590-017-1996-7.

[4] Özer D, Arıkan Y, Gür V, Gök C, Akman YE. Chondroblastoma: an evaluation of the recurrences and functional outcomes following treatment. Acta Orthop Traumatol Turc 2018;52(6):415–18. doi:10.1016/j.aott.2018.07.004.

[5] Negri S, Wangsiricharoen S, Chang L, Gross J, Levin AS, Morris CD, et al. Clinicopathologic analysis of chondroblastoma in adults: a single-institution case series. Int J Surg Pathol 2021;29(2):120–8. doi:10.1177/1066896920927794.

[6] Abdelwahab IF, Hermann G, Klein MJ, Silver A, Kenan S, Lewis MM. Case report 696: chondroblastoma of the right acetabulum and superior pubic ramus. Skeletal Radiol 1991;20(7):547–9. doi:10.1007/BF00194257.

[7] Jee WH, Park YK, McCauley TR, Choi KH, Ryu KN, Suh JS, et al. Chondroblastoma: MR characteristics with pathologic correlation. J Comput Assist Tomogr 1999;23(5):721–6. doi:10.1097/00004728-199909000-00016.

[8] Nascimento D, Suchard G, Hatem M, de Abreu A. The role of magnetic resonance imaging in the evaluation of bone tumors and tumor-like lesions. Insights Imaging 2014;5(4):419–40. doi:10.1007/s13244-014-0339-z.

[9] Wang J, Du Z, Yang R, Tang X, Yan T, Guo W. Analysis for clinical feature and outcome of chondroblastoma after surgical treatment: a single center experience of 92 cases. J Orthop Sci 2022;27(1):235–41. doi:10.1016/j.jos.2020.12.009.

[10] Lin PP, Thenappan A, Deavers MT, VO Lewis, Yasko AW. Treatment and prognosis of chondroblastoma. Clin Orthop Relat Res 2005;438:103–9. doi:10.1097/01.blo.0000179591.72844.c3.