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Case Report

# A rare case of soft tissue chondroblastoma of the quadratus femoris muscle: A case report and literature review ☆,☆☆

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ABSTRACT

Chondroblastomas are very rare benign primary bone tumors that typically develop in bones in young adults. Extraosseous chondroblastomas are extremely rare, with a few case reports documented in the literature. The treatment is surgical with a high healing rate. MRI is a key examination for bony forms, and our study has strengthened the MRI description reported in some cases of the extraosseous form. We describe the case of a 40-year-old woman with a chondroblastoma of the soft tissues of the hip more precising in the quadratus femoris muscle and its clinical, radiological, and MRI appearance. The patient underwent complete surgical excision of the mass, and no clinical or MRI signs of recurrence were detected after 18 months of follow-up.



## Introduction

Chondroblastomas are very rare benign primary bone tumors that typically develop in the epiphyseal or epiphysometaphyseal regions of long bones in children and adolescents [1]. Extraosseous chondroblastomas are extremely rare and have only been described in case reports, with favorable outcomes following surgical excision [2]. In this paper, we report a histologically confirmed case of a chondroblastoma located in the quadratus femoris muscle without any bony involvement.

## Case presentation

This is a 40-year-old woman with no prior history of chondroblastoma of bone, who has had moderate permanent pain

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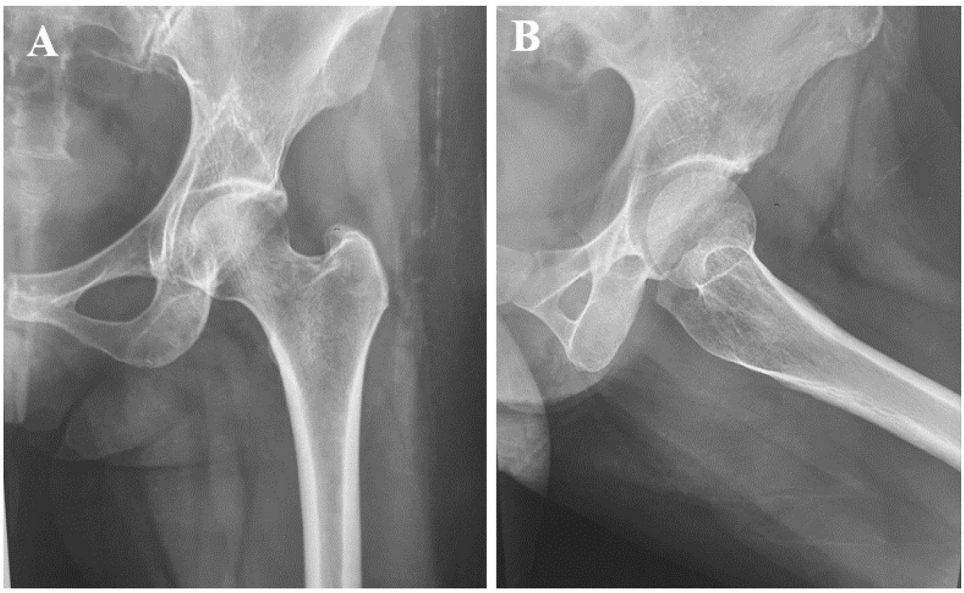


**Fig. 1 – AP and frog leg lateral radiographs of the left hip shows no calcified soft tissue mass.**

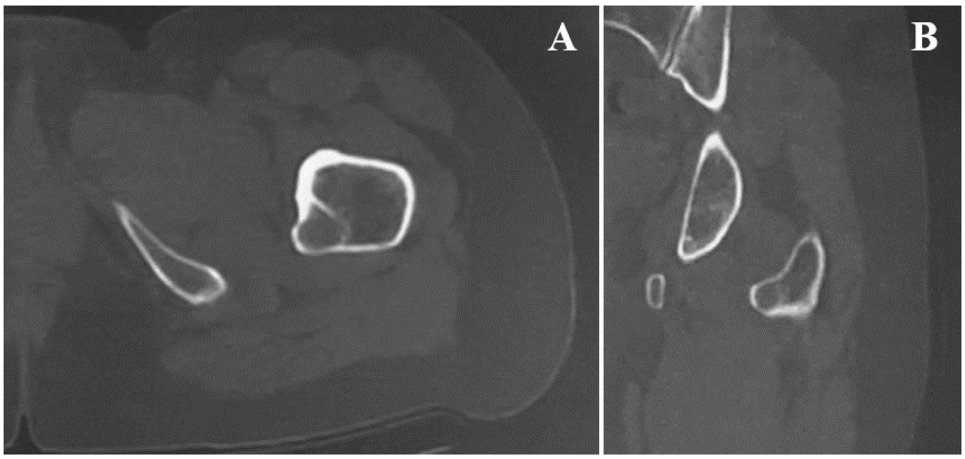


**Fig. 2 – Axial CT image and coronal reformatted image reveal no bone lesion or calcified soft tissue mass.**

unrelated to effort in the left groin crease over the past 15 years with no functional repercussions. The clinical examination revealed slight pain in the groin crease with no palpable mass or inflammatory signs, and the hip remained completely mobile. The patient did not report any fever or weight loss. The laboratory tests showed no abnormalities. The standard X-ray (Fig. 1) and CT scan (Fig. 2) of the hip did not reveal any bony abnormality, but the MRI (magnetic resonance imaging) scan did reveal a roughly oval mass measuring 27 × 12 × 23 mm deep within the left quadratus femoris muscle. This mass had hyperinternse signal in the IDEAL T2 sequence, isointense to muscle in the T1 sequence (Fig. 3), and was intensely enhanced after injection of Gadolinium (Fig. 4), The mass is encapsulated and lies on the cortical surface of the lesser trochanter with no signal abnormality in the subjacent bone.

The patient underwent a surgical excisional biopsy using the LUDLOFF approach. Surgical exploration identified an encapsulated oval shaped mass of firm consistency, approximately 3 cm in size, stuck to the tendon of the iliopsoas muscle (Fig. 5), which was referred for anatomopathological study.

Histological microscopic study revealed a proliferation of round, polygonal cells with an oval nucleus, abundant eosinophilic cytoplasm corresponding to chondroblasts. Osteoclast-like giant cells were also present (Fig. 6). The immunohistochemical study showed positive labelling of the cartilage matrix and chondroblastic cells, and the diagnosis of extraosseous chondroblastoma was therefore retained. After 18 months, the patient reported that her pain had disappeared, and a follow-up MRI scan showed no signs of recurrence (Fig. 7).

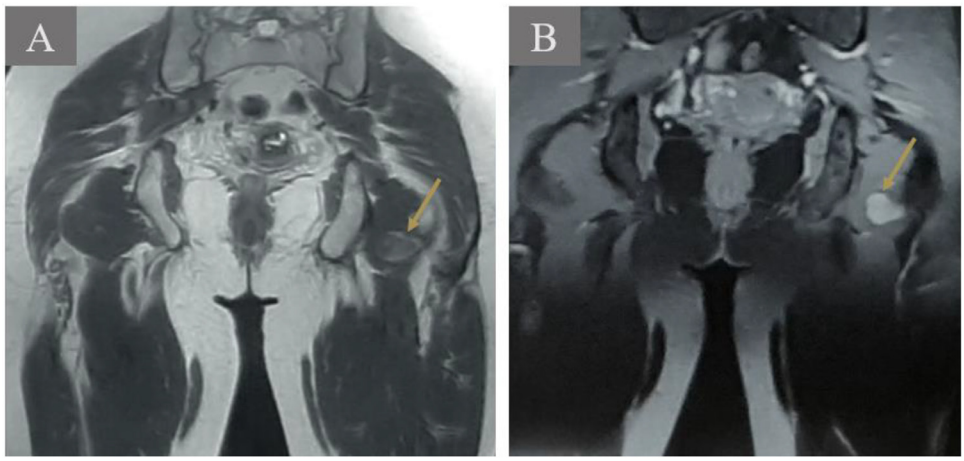


**Fig. 3 – (A) Coronal T2 MR image shows a lesion (yellow arrow) located in the left quadratus femoris muscle that is hyperintense to muscle. (B) Coronal IDEAL T2 MR image shows hyperintense signal within the left quadratus femoris muscle mass.**

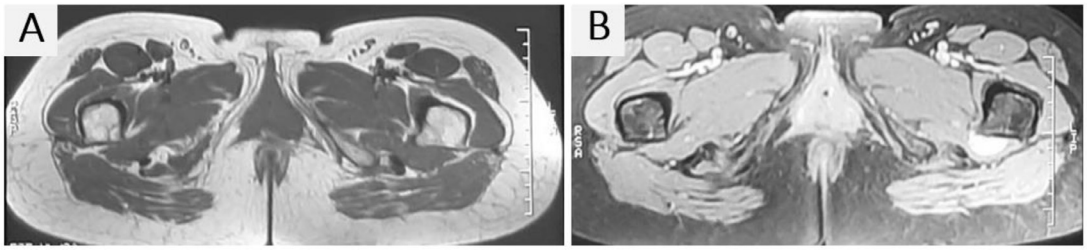


**Fig. 4 – (A) Axial T1 image showing a lesion located in the left quadratus femoris muscle that is iso-intense to the muscle. (B) Axial T1 fat suppression MR images post gadolinium injection reveals homogeneous enhancement.**

## Discussion

Chondroblastoma is a benign bone tumor of cartilaginous origin [3] which is rare, accounting for only 0.5% to 1% of primary bone tumors [4]. It is described as benign epiphyseal chondroblastoma according to the International Classification of the World Health Organisation (WHO) [4] because the intraosseous form is the most common, whereas soft tissue chondroblastomas have only been described in few case reports, like a case described in 1971 by Kingsley in the non-cartilaginous portion of the external ear [2], another case described in the subcutaneous tissue on the anterior part of the right shoulder in 1985 by Abdul-Karim [6] and a case described in 1987 by Weinrauch was a retro-auricular cutaneous chondroblastoma of the temporal region [7]. Chondroblastoma of the bone is a tumor of the young adults, exceptional in infancy and after the age of 30 [4]; this age group was involved in our case and in 2 of the 3 cases mentioned above. Like intraosseous forms, soft tissue chondroblastomas are painless or slightly painful [4], and may be revealed by a palpable nodule in superficial forms [6]. The standard radiological work-up is a key examination for intraosseous forms and allows the diagnosis to be evoked [8], and the CT scan may inconstantly show intra-lesional calcifications [3], although in our case these 2 examinations were unremarkable. MRI is a key examination in bony forms, showing in typical cases an intraosseous lesion with well-defined, slightly lobulated contours, sometimes surrounded by significant bone oedema, with a homogenous signal equivalent to that of skeletal muscle in T1-weighted sequences. The appearance of the tumor on T2-weighted sequences is more variable and always heterogeneous due to the coexistence of areas of high cellularity and calcifications [9]; this tumor shows strong contrast after injection of Gadolinium [5]. The MRI appearance of an extraosseous form of chondroblastoma reported in the literature [10] showed an iso-signal lesion with a heterogeneous center on T2-weighted sequences. On T1-weighted sequences, the lesion was iso-signal with strong contrast enhancement, whereas in our case, a homogeneous hyper signal was observed on T2-weighted sequences and an intermediate signal on T1-weighted sequences, with strong contrast enhancement throughout the entire mass after gadolinium injection. The histological features of this tumor include a proliferation of round polygonal cells with eosinophilic cytoplasm and a centered enlarged nucleus which often has a

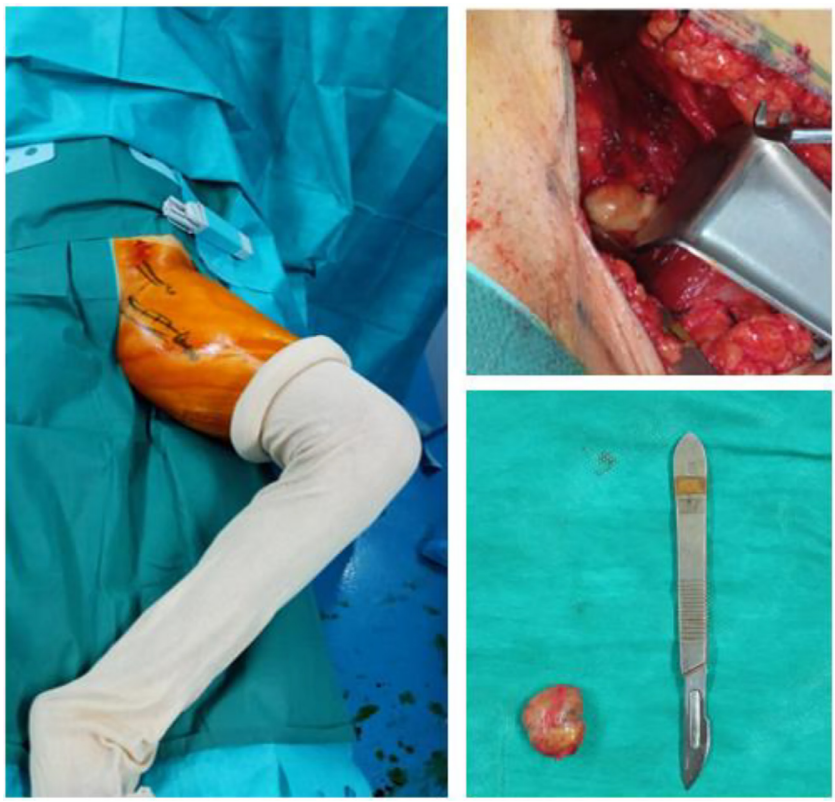

**Fig. 5 – Intraoperative images illustrate the Ludloff approach, highlighting the mass in contact with the iliopsoas tendon.**

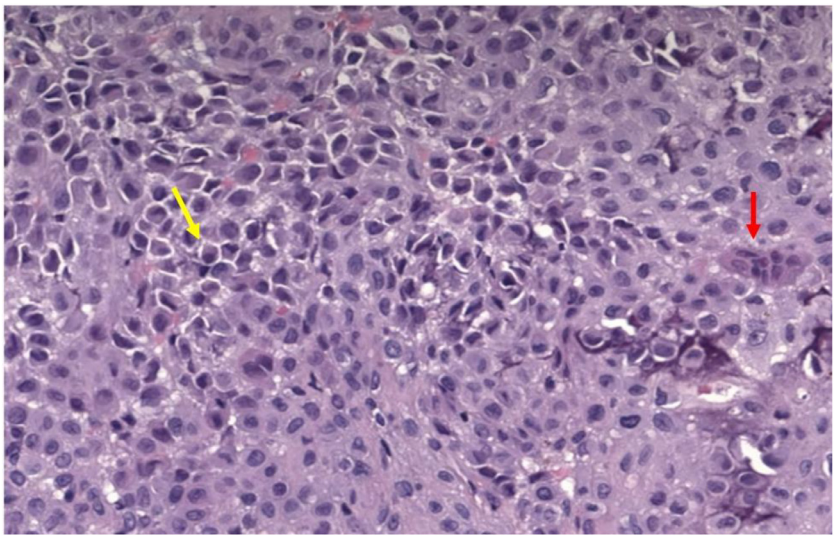

**Fig. 6 – Microscopic examination reveals proliferation of round, polygonal cells with an oval nucleus, abundant eosinophilic cytoplasm corresponding to chondroblasts (yellow arrow) and osteoclast-like giant cells (red arrow).**

longitudinal nuclear groove giving a 'coffee bean' appearance, in addition to which a variable number of multinucleated giant cells are frequently observed. Bluish or violet granular calcifications are seen in about a third of chondroblastoma cases; these calcifications may occur in the cytoplasm or in the cell stroma, and present a pericellular lace-like appearance, known as 'chicken-wire' [11]. In terms of evolution, these tumors present a risk of recurrence of up to 38% according to Huvos [12], of histologically benign pulmonary metastases of less than 1% [13] and in rare cases of malignant transformation [4]. The treatment of chondroblastoma of bone is surgical and consists either of curettage-filling or resection with possible reconstruction, with healing being obtained in most cases [4]; this healing was obtained in our case and also for

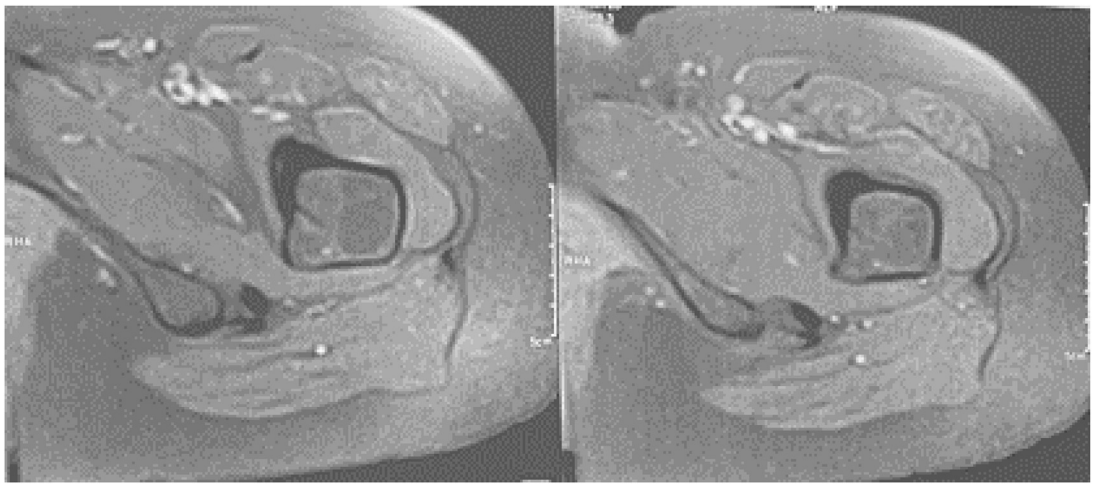

**Fig. 7 – MRI after 18 months, axial section in T1 sequence with gadolinium injection, shows no signs of recurrence.**

the extraosseous forms described, with no local or distant recurrence.

## Conclusion

Extraosseous chondroblastoma is an extremely rare benign tumor. Since it has a nonspecific MR appearance, histologic diagnosis is needed by either biopsy or excision. Prior to the diagnosis of primary chondroblastoma of soft tissue, it must be shown that the patient does not have a history of chondroblastoma of bone since soft tissue metastasis has been rarely reported in patients with chondroblastoma of bone.

## Patient consent

Consent was obtained from the patient for publication of this case report and accompanying images.

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