

# Giant Cell Tumor of the Patella: An Uncommon Site

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## ABSTRACT

Primary tumors of the patella are rare of which Giant cell tumor is the most frequent. Patient usually presents with pain in anterior knee and swelling. Radiologically, Giant cell tumor usually presents as a well defined lytic lesion with no sclerotic margin, no periosteal reaction and no soft tissue involvement unless complicated by fracture and shows enhancement on post-contrast study. Herein, we report the case of a 31-year female with giant cell tumor of the patella (GCT) with its clinical and radiological features.

**Keywords:** *Fracture, Spontaneous; Giant cell tumor; Patella*

## INTRODUCTION

Giant cell tumor (GCT) accounts for 4–5% of all primary bone tumors and usually affects the ends of long bones.<sup>1</sup> Patella is reported to be rare sites for developments of tumors among which most frequent are giant cell tumor in adults and chondroblastoma in children.<sup>2</sup> GCT of patella presents with pain and swelling and rarely with pathological fractures.<sup>3</sup>

## CASE REPORT

A 31 year female presented with a history of intermittent pain around the knee for 1 year which was increasing since 1 week. Physical examination revealed mild swelling and slight tenderness in the region of knee. The laboratory data were within the normal limits. Plain radiographs revealed a well-defined, lytic lesion with bubbly appearance involving almost entire of the patella with no periosteal

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reaction, no matrix mineralization and no soft tissue involvement (Fig 1a). CT scan also showed a well defined lytic lesion involving almost entire of the patella with no calcification, no periosteal reaction and no soft tissue involvement (Fig 1b).

On magnetic resonance imaging (MRI), the lesion exhibited isointensity to slightly higher signal intensity compared to skeletal muscle on T1-weighted sequences and heterogeneously high signal intensity on T2-weighted sequences. Contrast-enhanced T1-weighted sequences demonstrated a heterogeneously mild enhancement of the lesion with nonenhancing areas within (Fig. 1c). There was no obvious soft tissue or intra-articular extension. Based on these imaging findings, possibility of giant cell tumor was suggested.

Patient underwent patellectomy in the orthopedic department and the sample was submitted to the department of pathology for histopathological evaluation which confirmed the diagnosis of giant cell tumor of the patella with mitotic figure of 4 mitosis/10hp with areas of hemorrhage.

## DISCUSSION

Patellar tumors represent an uncommon etiology of knee pain and swelling as it is an

unusual location for any primary or secondary bone tumor.<sup>4</sup> The most common benign tumor is GCT, followed by chondroblastoma and aneurysmal bone cyst.<sup>2</sup> Metastases are the most frequent malignant tumors of the patella and primary malignant lesions predominantly include osteosarcoma, hemangioendothelioma and lymphoma.<sup>2</sup>

GCT of bone was first described by Cooper and Travers in 1818.<sup>5</sup> GCT is usually benign but sometimes they may be locally aggressive<sup>6</sup>; typically affect the ends of long bones, particularly the distal femur and proximal tibia and has a peak incidence in the third or fourth decade of life, with a marginal female predominance.

The differential diagnosis on imaging that should be considered in this case are chondroblastoma, hemangioma, osteoblastoma and enchondroma.

Chondroblastoma is the second most common benign patellar tumor presenting in second decade of life as a well defined radiolucent lesion with sclerotic margin and no periosteal reaction. It may demonstrate calcification in the patellar matrix in CT scan and may sometimes show fluid – fluid level on MRI.<sup>7</sup> Hemangioma is rare (~2%) patellar tumors usually manifesting as radiolucent lesion with absent periosteal reaction, calcification



Figure 1 a



Figure 1b

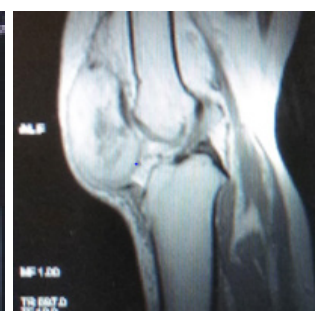


Figure 1c

**Figure 1:** a. X ray showing lytic lesion with bubbly appearance of patella. b. CT showing a well-defined, lytic lesion involving almost entire of the patella with no calcification, no periosteal reaction and no soft tissue involvement. c. Contrast TIW MRI showing mild heterogeneously enhancing lesion with non enhancing areas within.

and septation in the patella and exhibits increased signal intensity on T1- and T2-weighted sequences, possibly due to the fat content of the lesion.<sup>6</sup> Osteoblastoma of the patella also presents as osteolytic lesion with a thin sclerotic rim without evidence of extra-articular involvement and calcification better appreciated on CT.<sup>8</sup> Enchondroma of the patella presents as well defined radiolucent lesion with well-defined margins and small calcifications but without any periosteal reaction, sclerotic rim, septations, fluid levels, pathologic fracture, or joint involvement.<sup>7</sup>

## CONCLUSION

Though giant cell tumor rarely occurs in patella, it is the most common tumor of patella and GCT should always be considered when lytic lesion in patella is noted on imaging.

## CONFLICT OF INTEREST

None

## SOURCES OF FUNDING

None

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