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Benign but Telling: Imaging Features of Fibrous Cortical Defects in Two Pediatric Patients

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ABSTRACT

Fibrous cortical defects are common benign bone lesions in children and adolescents, usually discovered incidentally but occasionally symptomatic. We report two pediatric cases of fibrous cortical defects with different imaging approaches. The first case involved a child presenting with limb pain, in whom plain radiography revealed a small intracortical lytic lesion of the distal third of the left femoral diaphysis. The second case concerned a 10-year-old child with ankle pain and limping, in whom computed tomography demonstrated two small intracortical lytic lesions of the tibia and fibula with characteristic benign features. In both cases, imaging findings were consistent with fibrous cortical defects. These cases illustrate the typical radiographic and CT appearances of fibrous cortical defects and highlight the role of appropriate imaging modalities in establishing diagnosis and avoiding unnecessary invasive procedures in pediatric patients.

KEYWORDS

Fibrous cortical defect, Pediatric bone lesion, Femur, Tibia

MAIN ARTICLE

INTRODUCTION

Fibrous cortical defect (FCD) is a benign fibro-osseous lesion occurring in children and adolescents, belonging to the fibroxanthoma spectrum. It represents one of the most frequent benign bone findings in the pediatric population. Although typically asymptomatic and self-limiting, fibrous cortical defects may occasionally present with pain, prompting further imaging evaluation to exclude more aggressive pathology [1,2].

CLINICAL INFORMATION

Case 1

A 6-year-old child presented with localized pain of the left lower limb without history of trauma or systemic symptoms. Clinical examination revealed mild functional discomfort without signs of infection. A plain radiograph of the left femur was performed as the initial imaging examination.

Case 2

A 10-year-old child with no significant medical history presented with a two-month history of spontaneous left ankle pain associated with limping and relative functional impairment. There was no history of trauma. Plain radiography demonstrated a cortical bone abnormality of the left leg, prompting further evaluation with computed tomography for lesion characterization.

IMAGING FINDINGS

Case 1

Plain radiography revealed a well-defined intracortical lytic lesion located in the distal third of the left femoral diaphysis. The lesion was elongated along the longitudinal axis of the bone, measured less than 1 cm, and was surrounded by a thin, regular sclerotic rim. There was no associated periosteal reaction, cortical destruction, or soft tissue abnormality. Radiographic features were suggestive of a fibrous cortical defect (Figure 1).

Case 2

Computed tomography demonstrated two well-defined intracortical lytic lesions, each measuring less than 20 mm, surrounded by marginal sclerosis. The lesions were located at the lateral tibial and medial fibular diaphyseal–metaphyseal junctions of the left leg. The

medullary cavity was preserved, with no periosteal reaction and no associated soft tissue component. These CT findings were consistent with fibrous cortical defects (Figures 2 and 3).

DISCUSSION

Fibrous cortical defects are benign developmental lesions resulting from focal fibroblastic proliferation within the cortical bone. They most commonly occur between the ages of 2 and 15 years and predominantly involve the metaphyseal or diaphyseal–metaphyseal regions of long bones, particularly the femur and tibia.

Fibrous cortical defects are part of the fibroxanthoma spectrum, along with non-ossifying fibromas, from which they differ mainly by size. By convention, fibrous cortical defects measure less than 2 cm and remain confined to the cortex, whereas non-ossifying fibromas are larger and may extend into the medullary cavity [3,4].

Radiologically, fibrous cortical defects classically present as small, well-defined intracortical lytic lesions with a thin sclerotic rim, elongated along the long axis of the bone. The absence of aggressive features—such as periosteal reaction, cortical destruction, medullary invasion, or soft tissue mass—is key to establishing the benign diagnosis.

Plain radiography is often sufficient for diagnosis, as illustrated in Case 1. However, computed tomography may be useful in symptomatic or atypical cases to better assess cortical involvement, lesion margins, and relationship to surrounding structures, as demonstrated in Case 2. CT imaging helps exclude important differential diagnoses such as osteomyelitis, Langerhans cell histiocytosis, or malignant bone tumors [3,5].

Management of fibrous cortical defects is conservative in most cases, as these lesions typically regress spontaneously with skeletal maturation. Clinical follow-up may be considered in symptomatic patients, while biopsy or surgical intervention is rarely indicated.

CONCLUSION

Fibrous cortical defects are common benign bone lesions in children that may occasionally become symptomatic and raise diagnostic concern. Recognition of their characteristic imaging features on plain radiography and CT is essential to establish the diagnosis and avoid unnecessary invasive procedures. These two cases illustrate the typical appearance of fibrous cortical defects in different long bones and emphasize the role of appropriate imaging in pediatric patient management.

FIGURES

Figure 1: Plain radiograph (Case 1) showing a small, well-defined intracortical lytic lesion in the distal third of the left femoral diaphysis with a thin sclerotic rim.

Figure 2: Coronal CT reconstruction (Case 2) showing two intracortical lesions involving the lateral tibia and medial fibula at the diaphyseal–metaphyseal junction.

Figure 3: Coronal CT reconstruction (Case 2) demonstrating an intracortical lytic lesion of the left tibia with marginal sclerosis and preserved medullary cavity.

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