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Case Report

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Non-ossifying fibroma of distal tibia: case report

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ABSTRACT

Non-ossifying fibroma is a benign fibrohistiocytic lesion most commonly seen in the metaphyseal region in children. It usually doesn't present with any symptoms. As the bone grows and undergoes remodeling, the lesion tends to vanish and get substituted with healthy bone. Nonetheless, the lesion can debilitate the affected bone, leading to a potential fracture. Here, we report a case of non-ossifying fibroma in the metaphyseal region of the tibia in a 13-year female. The patient presented with complaints of pain in the left leg for 5 months and underwent radiological investigation showing a well-defined, multi-loculated, expansile, radiolucent, lytic lesion with a thin sclerotic margin in the meta-diaphyseal region of the distal tibia, for which extended bone curettage with bone grafting was performed. The sample was sent for histopathological examination, which showed bony trabeculae with bits of tumor composed of spindle cells with elongated nuclei and scant cytoplasm, arranged in a storiform pattern along with many scattered multinucleate giant cells and foamy histiocytes suggestive of non-ossifying fibroma. Post operatively, non-weight bearing mobilization was advised for 4 weeks. Most non-ossifying fibromas were diagnosed in childhood to late adolescence, found incidentally, and clinically asymptomatic. Most distal tibial non-ossifying fibromas (NOFs) tend to transpire at a specific anatomical site located at the far end of the interosseous membrane. The prognosis for NOFs is typically excellent with a low risk of recurrence.

Keywords: Non-ossifying fibroma, Adolescent, Metaphysis, Extended bone curettage

INTRODUCTION

Non-ossifying fibroma (NOF) is a frequent benign abnormality that occurs in individuals who are still growing and typically among first and second decade of life.[1] At times, this type of growth is also referred to as a fibrous cortical defect. As per the studies, roughly 32 to 45% of children encounter one or multiple non-ossifying fibromas while their skeletal system is developing.[2] These fibromas usually emerge slowly and don't exhibit any symptoms during that time. Only a small number of these lesions are significant enough to cause discomfort in the affected limb and are typically detected incidentally.[3] The identified causes may be related to gene mutations, that is in approximately 80% of tumors, there are cell mutations, that activate the RAS-MAPK pathway. Non-ossifying fibroma has a preference for the metaphyseal area of the long bones, despite being initially characterized as a type of "chronic fibrous osteomyelitis".[4] NOFs are typically single lesions. However, in Jaffe–Campanacci syndrome, multiple NOFs associated with café-au-lait spots and axillary freckling are present. NOFs should also be differentiated from fibrous cortical defect, which are more common smaller lesions mimicking the radiological and clinical features of NOF. Several authors have suggested that NOF, Jaffe–Campanacci syndrome and fibrous cortical defect may have different presentations in one disease spectrum.[5]

Even though the disease has a slow onset and doesn't present any clinical symptoms, diagnosing it can be challenging, and confirmation may require imaging and identifying the distinct pathological features. Symptoms are usually related to direct compression of the surrounding tissues from the lesion and/or weakening of the bone tissue. When a lesion becomes symptomatic due

to persistent pain, it is considered to be risk of pathologic fracture.

To promote bone healing, many reconstructive procedures have been described, including curettage, curettage followed by autologous or heterologous bone grafting in conjunction with internal or external fixation, percutaneous cryoablation, and percutaneous autogenous bone marrow grafting. This research paper presents a case study of a 12-year-old girl with a non-ossifying fibroma in her left tibia, and it also examines the uncommon characteristics of the disease by analyzing its imaging, clinical, and histological features.

CASE REPORT

A 13-year-old girl presented to the orthopaedic clinic because of pain in the left leg for 5 months. At the time of presentation, the female appeared to be alert, oriented, and in an appropriate mood, without any evident signs of discomfort or distress. The patient had antalgic gait without the use of an assistive device. Physical examination revealed mild tenderness on the anteromedial side of the leg with no swelling, effusion, or limitation of motion. The patient had no history of trauma or any other medical illness. Plain radiographs of the left leg showed a well-defined, multiloculated, expansile, radiolucent lytic lesion with a thin sclerotic margin in the meta-diaphyseal region of the distal tibia. There were no significant contour changes in the cortex (Figure 1).

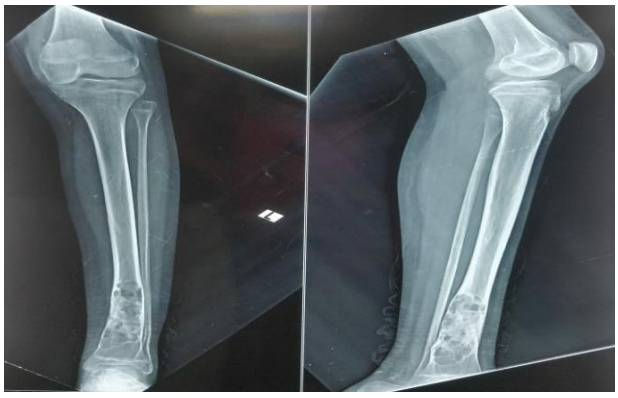

Figure 1: Anteroposterior and lateral X-ray of left leg: X-ray showing a well-defined, multi-loculated, expansile, radiolucent, lytic lesion with thin sclerotic margin in meta-diaphyseal region of left distal tibia with a narrow zone of transition. There is no periosteal reaction and calcification.

Based on radiographic findings, chondromyxoid fibroma, non-ossifying fibroma, enchondroma, chondroblastoma, and fibrous dysplasia were considered as differential diagnoses.

Extended bone curettage with bone grafting was performed and the sample was sent for histopathological examination (Figure 2).

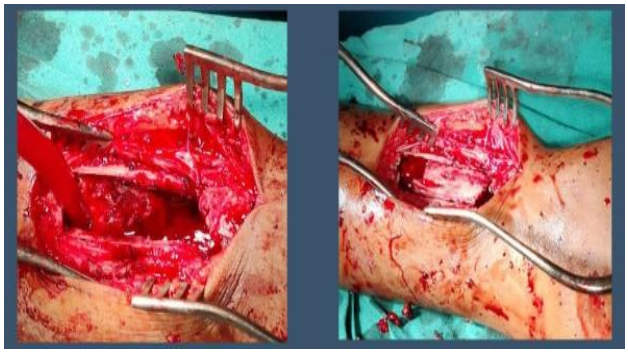

Figure 2: Intra-operative imaging of the patient: extended bone curettage done and specimen is sent for biopsy,

Biopsy showed bony trabeculae with bits of tumor composed of spindle cells with elongated nuclei and scant cytoplasm, arranged in a storiform pattern along with many scattered multinucleate giant cells and foamy histiocytes, suggestive of non-ossifying fibroma (Figure 3).

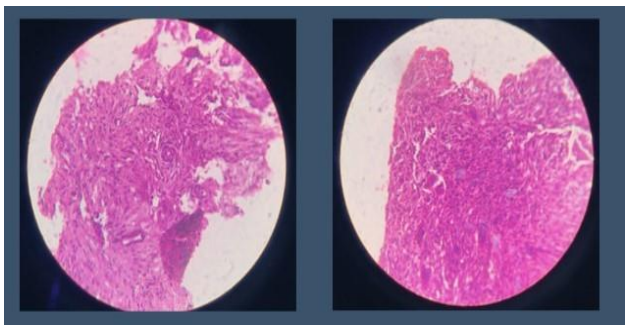

Figure 3: Microscopic view of specimen: section showed bony trabeculae with bits of tumor composed of spindle cells with elongated nuclei and scant cytoplasm, arranged in a storiform pattern along with many scattered multinucleate giant cells and foamy histiocytes.

Postoperatively, non-weight-bearing mobilization was advised for 4 weeks. At 12 months of follow up, there is no pain in her extremity and radiographs showed no recurrence.

DISCUSSION

The non-ossifying fibroma is a non-cancerous growth that typically arises in the distal femur, as well as tibia.[1] The incidence of non-ossifying fibroma is 30-40% of children two to fifteen years, and the male: female ratio is 2:1.[2] It typically arises in the metaphysis of long bones and migrates toward the diaphysis with growth.[3] Typically, these growths are asymptomatic and are often detected incidentally during the examination of radiographic images. Spontaneous healing and ossification of NOFs is a rule, i.e., the lesion generally resolves spontaneously, usually at skeletal maturity. Recurrence is rare.

Nonossifying fibroma can be diagnosed using plain radiographs with an accuracy of 100%.[5,6] On plain radiography, the lesion was eccentric and multi- or uniloculated. It is well demarcated by a sclerotic rim.[4] The main conditions that are typically considered in the process of differential diagnosis are fibrous cortical defect and unicameral bone cyst. In addition, other bone lesions that may resemble these conditions include giant cell tumor, fibrous dysplasia, adamantinoma, ossifying fibroma, osteoid osteoma, enchondroma, and chondroblastoma, Langerhans cell histiocytosis, desmoplastic fibroma, hyperparathyroidism, chondromyxoid fibroma, myeloma, Ewing's sarcoma, and lymphoma.

Surgery is generally not required because of the high rate of spontaneous regression and lack of symptoms.[7-10] According to Arata's criteria, surgical treatment is indicated when the lesion is associated with pathologic fracture or a potential risk of pathologic fracture defined by an involvement greater than 50% of the transverse diameter of the bone or a length of 33 mm.[11] Nevertheless, if these growths cause pain or lead to pathological fractures, then surgical intervention may be necessary to address the issue. Although fractures due to NOFs have shown good healing potential, an additional bone graft may be helpful in obtaining a faster, stronger union. The prognosis is excellent. The authors suggest that biopsy is necessary for the accurate diagnosis of such a case, although most cases of non-ossifying fibroma can be diagnosed using plain radiographs.

CONCLUSION

Most non-ossifying fibromas were diagnosed in childhood to late adolescence, were found incidentally and were clinically asymptomatic. The vast majority of distal tibial NOFs occur in a distinct anatomic location at the distal extent of the interosseous membrane. The prognosis for NOFs is typically excellent, with a low risk of recurrence.

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