



Foreign body granuloma mimicking a soft tissue neoplasm

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ABSTRACT

An 11 year old male child came with complaints of pain and swelling in the left ankle region since 1 year with no previous history of trauma. Tailored X-rays of the ankle and contrast enhanced computed tomography scan of the ankle were performed on the patient in order to obtain maximum diagnostic output. Radiological evaluation revealed well defined soft tissue lesion at the medial aspect of the distal diaphysis of the left tibia with no bony involvement. Surgical exploration revealed a foreign body with granuloma formation. It is difficult to suspect foreign body granuloma particularly in the absence of history of trauma. Even in the absence of a history of trauma, an organic foreign body lesion should be considered in the differential diagnosis of a soft tissue lesion, so as to avoid mis-diagnosis and to initiate accurate treatment.

Keywords: Foreign body, Mimicking, Non-traumatic, Granuloma, MDCT, MRI

Abbreviations:

Magnetic Resonance Imaging (MRI)
Multidetector Computed Tomography (MDCT)
Gadolinium (Gd)

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INTRODUCTION

Foot is more prone to foreign body injuries than being the second commonest during daily activities and due to occupational exposures [1]. Patients usually present with non-specific symptoms such as pain and/or swelling and it will be of great difficulty if no previous history of trauma is recognized, making its detection important to avoid serious complications [2][3]. Foreign body granuloma is mainly divided into granulation by a penetrating foreign body such as wooden splinter or other materials and iatrogenic gossypiboma by retained surgical sponge during operation [4] [5]. Without a guiding history, foreign bodies have the potential to be overlooked by the unsuspecting radiologist. Additionally, the sequelae of a chronically retained foreign body could be attributed to a more sinister process such as malignancy, resulting in unnecessary stress and treatment for the patient [6].

We present a case of foreign body granuloma in which the radiological diagnosis was narrowed down by MDCT and MRI. Further, which was confirmed on surgical exploration.

MATERIAL AND METHOD

Tailored X-rays of the ankle region and contrast enhanced multislice multidetector computed tomography (MDCT) scan of the ankle were performed on 128 multislice scanner in order to obtain maximum diagnostic output and minimize the dose of radiation. Gadolinium (Gd) enhanced multiplanar multiecho magnetic resonance imaging (MRI) of the ankle was performed on a 1.5 Tesla machine.

CASE REPORT

An 11 year old male child was referred to our institute with complaints of pain and swelling in the left ankle region since 1 year. On detailed past history no significant history of trauma was recollected. Local examination of the swelling revealed a tender mass on the antero-medial region of the left lower limb with the overlying skin being intact. No overlying edema/inflammation was noted. As a routine protocol the patient was advised plain radiographs of the left ankle region for further evaluation. Frontal and lateral radiographs of the ankle revealed a well-defined soft tissue swelling along the medial aspect of the distal diaphysis of the left tibia with a linear well-defined radiopacity within (figure 1 & 2). The differential diagnosis on the radiograph included: Hematoma, foreign body, ganglion, nerve sheath tumors,

granuloma and sarcoma. MDCT was performed for precise evaluation of the radio-opacity on plain radiograph which revealed a well-defined, oval, isodense thin walled soft tissue mass lesion was seen at the distal diaphysis of the left tibia which showed a central linear hyperdense area (of average attenuation of +400 HU) (figure 3, 4 & 5). A high possibility of a penetrating foreign body was raised. Clinical history was reviewed but the patient denied for any history of previous trauma. For further characterization of the soft tissue swelling a Gd enhanced MRI of the ankle was advised. MRI of the ankle revealed an oval well defined thick walled lesion at the medial aspect of the distal diaphysis of the left tibia appearing isointense on T1WI and heterogeneously hyperintense on T2WI and STIR / PDFs sequences. A central hypointense area was noted on all sequences with mild perilesional edema (figure 6, 7, 8, 9 & 10). On Gd contrast administration the lesion showed marked peripheral enhancement with non-enhancing central zone within (figure 11 & 12).

At this stage, our diagnosis was narrowed down to foreign body granuloma formation. Considering the radiological diagnosis, the orthopedic surgeon decided to operate the case which revealed a well-defined thick walled fibrous capsule with necrotic material within and a small linear chip of wood.

DISCUSSION

Suspecting a foreign body granuloma particularly in the absence of history is very difficult. The median time from the injury to the detection of the lesion is variable from some months to many years (4 months – 20 years), and both the child and the family may have forgotten about the injury entirely. The morphology of the lesions varies widely depending on the type of the material involved, the size of the foreign body, and the site of trauma. When the history of the previous trauma is not obtained foreign body granuloma is easily mistaken for a primary soft tissue neoplasm [8]. Plain radiographs should be taken when the existence of foreign bodies is suspected. If the foreign body is radiopaque, we can easily identify the foreign body. However, to identify radiolucent foreign bodies, is extremely difficult by plain radiographs. In this case the radiopacity which was seen on plain radiograph was further evaluated on MDCT. MRI scan helped in characterization of the soft tissue swelling and reaching the final diagnosis. The others differential diagnosis includes hematoma, ganglion, nerve sheath tumors and sarcoma. If the foreign body is not removed immediately, or is not phagocytosed during the

acute inflammatory reaction, it becomes encapsulated with fibrous tissue and forms a granuloma [9]. Excision of the foreign body allows symptomatic and radiographic cure.

CONCLUSION

The possibility of foreign body should always be considered in young patients with swelling in the

foot and ankle region. It is possible to recognize the FB utilizing various imaging modalities, with conventional radiography considered the initial examination of choice followed by MDCT. MRI should be reserved to characterize complications the foreign body (abscesses, osteomyelitis, granulomas, adverse tissue reactions, as well as injury to vascular, tendinous or ligamentous structures).

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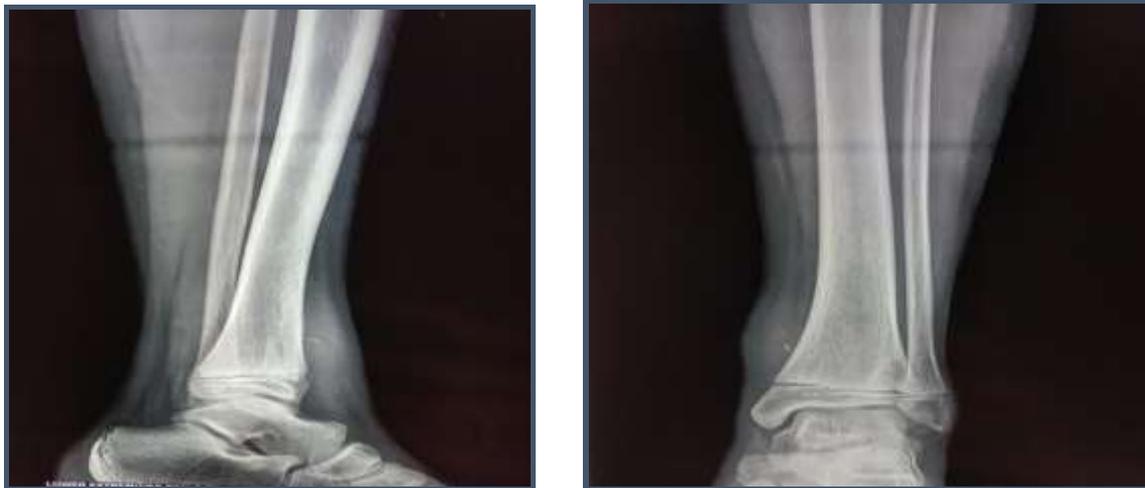


Figure 1 & 2: A well-defined soft tissue swelling along the medial aspect of the distal diaphysis of the left tibia with a linear well-defined radio-opacity within. No evidence of any cortical breach or overlying periosteal reaction was observed.



Figure 3, 4 & 5: A well-defined, oval, isodense thin walled soft tissue mass lesion was seen at the distal diaphysis of the left tibia which showed a central linear hyperdense area (of average attenuation of +400 HU).

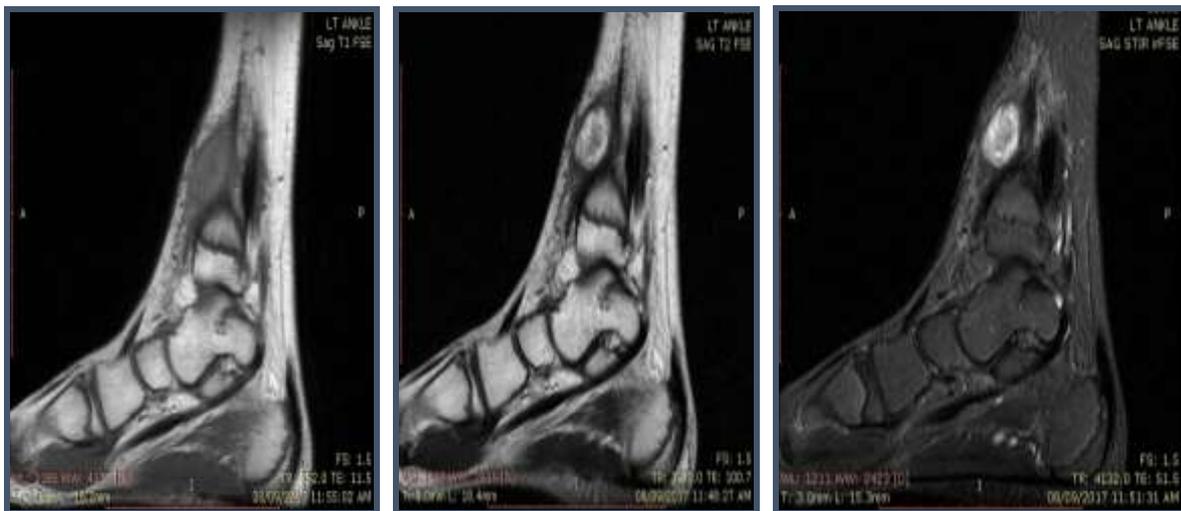


Figure 6, 7 & 8: An oval well defined thick walled lesion was observed at the medial aspect of the distal diaphysis of the left tibia appearing isointense on T1W and heterogeneously hyperintense on T2W and STIR sequences. A central hypointense area was noted on all sequences. There was mild peri-lesional edema.

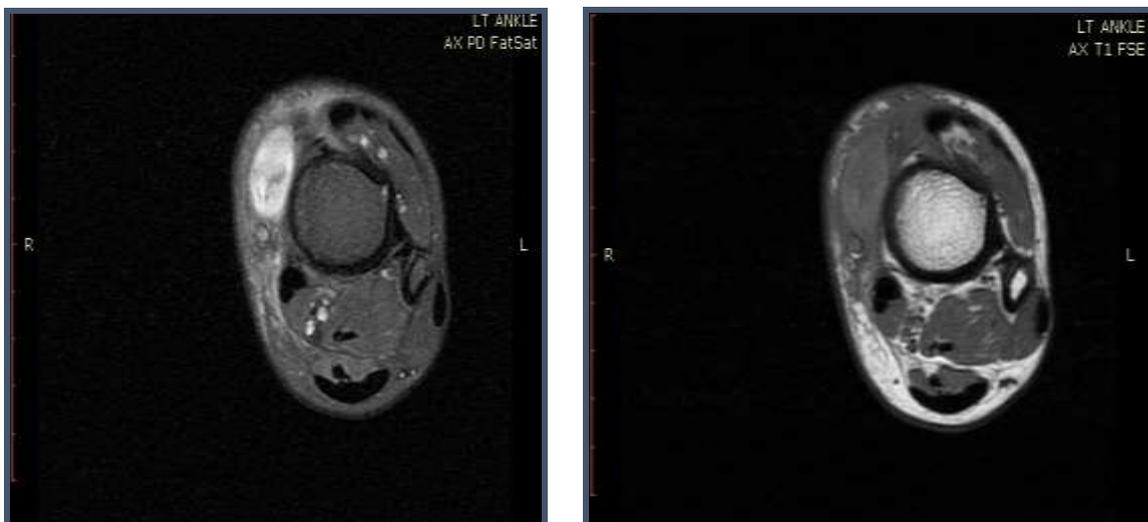


Figure 9 & 10: Axial PDFS and T1W FSE images reveal a well-defined soft tissue lesion showing altered signal intensity appearing isointense on T1W images and heterogeneously hyperintense on PDFS image.

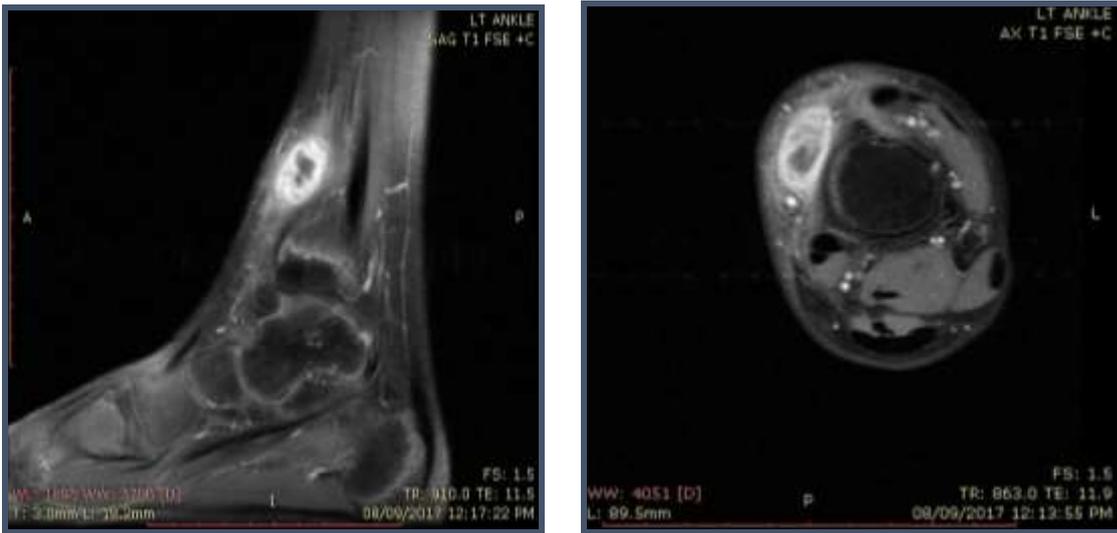


Figure 11 & 12: On Gd enhanced images the lesion showed marked peripheral enhancement with non-enhancing central zone within with no involvement of the underlying bone.

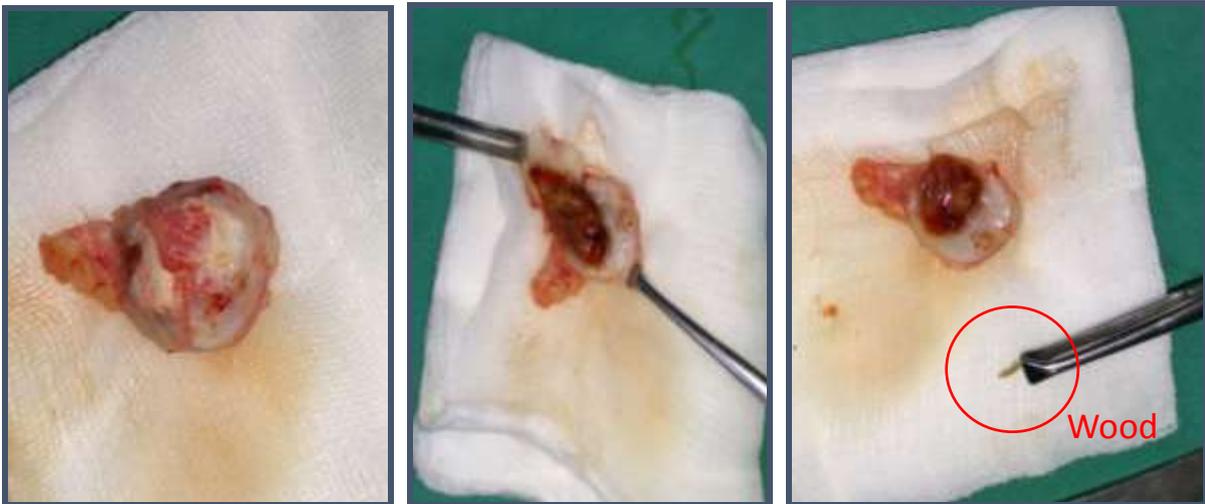


Figure 13 & 14: The gross pathology specimen of the excised lesion showed a well-defined thick walled fibrous capsule with necrotic material within and a small linear chip of wood.