Non-ossifying fibroma of tibia: X-ray, CT and MR evaluation
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Patient: 26 years, female

Clinical History:
Post motorcycle trauma radiologic control

Imaging Findings:
The patient presented to our institution after motorcycle trauma. A standard X-ray film was performed and demonstrated a radiolucent cortical lesion with a well-demarcated peripheral osseous shell, into the tibial metaphysis close to the growth plate. The woman was clinically silent and this oriented us to a diagnosis of fibrous cortical defect or nonossifying fibroma (NOF). A CT and a MRI scan were performed to confirm the diagnosis of NOF, to establish the exact size of the lesion and to evaluate the risk of fracture. CT showed the occupation of the upper third of the tibia by a globular fibrous mass, but no cortical reabsorption and no osseous modifications were evidenced. At MRI the lesion demonstrated low signal on both T1 and T2-weighted sequences and high signal in proton-density sequences that are the characteristic findings for NOF. No treatment has been suggested.

Discussion:
NOF are non aggressive fibrous lesions of bone that are occasionally detected on radiographs obtained for other reasons; NOF also are characteristically asymptomatic, however the larger lesions can became symptomatic with raised risk of fractures. These lesions typically occur in children and in adolescents and two times as frequently in males than in females; the exact frequency is unknown and no increase in morbidity and mortality is noted in either one. NOF are more commonly solitary, however multifocal lesions can occur; the lesions are usually larger than 3cm and eccentrically located. The long tubular bones are more often involved. Common sites include the distal femoral metaphysis (38%), the proximal and distal tibia (43%) and the knee (55%); most lesions occur around the knee, the tibial diaphysis is involved in only 10%, the fibula is affected in 8-10% of cases. Typically these lesions are located in the metaphysis ore arise close the epiphyseal plate. The histologic pattern is generally represented by spindleshaped fibroblasts with scattered giant cells, foam cells and small amounts of collagen; no mitosis or pleomorphism is present to suggest malignancy. Diagnosis can be simply performed on plain radiographs and biopsy is not necessary: the classic X-ray pattern consist of an elliptical radiolucent lesion with a sharply marginated sclerotic rim of reactive bone, eccentrically located within the metaphiseal cortex of long bones; larger lesion can appear multiloculated with erosion of the endosteal surface of the cortex. In these slow growing lesions, the increase in sclerosis which can fill in and replace the central lucent defect over time is often mistaken for fibrous dysplasia by the observer. Usually CT is performed only when exists a strong doubt about diagnosis or to confirm a pathologic fracture. Moreover CT scan may confirm minimally displaced fracture. MRI is generally not indicated however the lesion has been described to have a characteristic low signal on both T1 and T2 weighted spin echo; a peripheral hipointense rim represents the marginal sclerosis detected on radiographs and the peripheral reactive sclerosis present at histologic evaluation. No specific treatment or intervention is required, but surgical currettege and born
Graft procedures are needed to prevent pathologic fractures when the lesion becomes larger than 33mm or involves more than 50% of the transverse diameter of a critical weight-bearing bone. If pathologic fractures occur, casting is the most appropriate treatment. After surgical removal, the lesions usually don’t recur and prognosis is excellent.

**Differential Diagnosis List:** Nonossifying fibroma of the tibia

**Final Diagnosis:** Nonossifying fibroma of the tibia

**References:**


Figure 1

Description: Standard X-ray film on postero-anterior projection. The lesion appears as a slightly radiolucent mass located in the upper third of the tibia. Origin:
Description: The latero-lateral projection shows the posterior enlargement of the upper third of the tibia.
Origin:
Figure 2

**a**

Description: The coronal view on CT scan confirms the presence of a fibrous lesion with globular conformation that arises from the lateral surface of the marrow channel. **Origin:**

**b**

Description: Axial CT view clearly shows the occupation of large part of the marrow channel by the fibrous mass. **Origin:**
Description: On T2-weighted images the NOF appears as mildly hypointense mass with areas of low signal in correspondence of the zones with more fibrous apposition. Origin: