

Chronic Venous Insufficiency Mimicking Osteomyelitis

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Section: Musculoskeletal system

Area of Interest: Extremities Musculoskeletal bone

Musculoskeletal system

Procedure: Contrast agent-intravenous

Procedure: History

Imaging Technique: MR

Special Focus: Varices Case Type: Clinical Cases

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Patient: 49 years, male

Clinical History:

A 49-year-old man was admitted to the hospital complaining about painful left leg swelling with redness and difficulty in walking. He had a history of chronic venous insufficiency and hospitalization for an ulcerated skin lesion two years ago.

Imaging Findings:

On radiography, solid, thick, undulated periosteal reaction was seen, especially in the mid-to distal portion of the tibia and fibula (Fig. 1). Soft tissue calcifications, which may be compatible with phleboliths, were observed in the medial side of the cruris. Also, soft tissue appeared thin at the level where the fibula was thickest. However, there was no ulcerated wound except redness and swelling on physical examination. Thereupon, cruris MRI was performed to rule out osteomyelitis.

Hyperintense thick periosteal reaction on T1-weighted images and minimal intramedullary bone marrow oedema on PD-weighted images were seen on MRI. Medullary bone marrow signal in the fibula was relatively preserved on T1-weighted images (Fig. 2). Varicose venous structures were also noted in subcutaneous soft tissue (Fig. 3).

Discussion:

Chronic venous insufficiency (CVI) is often overlooked by physicians due to incomplete recognition of the various manifestation of the venous disorder [1]. CVI is a very common problem in adults, with an estimated prevalence is 9.4% in men and 6.6% in women. CVI represents a spectrum of conditions ranging from simple telangiectases or reticular veins to more advanced stages, such as skin fibrosis and venous ulceration [1]. Therefore, the clinical presentation is highly variable. The most common symptoms are lower extremity oedema, pain, and discomfort. On radiographs, subcutaneous oedema, superficial varicosities, soft tissue calcification and phlebolith can be seen. It can also result in a periosteal reaction that is an incidental finding on a plain radiograph [2].

Periosteal reaction is a cortical bone reaction that may be due to a wide variety of causes. Tumour, infection, trauma, certain drugs, and some arthritic conditions can elevate the periosteum from the cortex and form various patterns of periosteal reaction like solid, thick irregular, septated, laminated (onionskin), perpendicular, sunburst, disorganized, and Codman triangle [3,4]. Periosteal reaction in the image varies in function of the intensity, duration, and aggressiveness of the underlying cause [4]. Recognition of the presence of periosteal reaction is the most important point. Despite the considerable overlap, sometimes, the subtype of the periosteal reaction can suggest a specific disease. In our patient solid periosteal reaction was seen. Solid periosteal reaction is a nonaggressive form that is primarily seen with benign, slow processes. Osteoid osteoma, osteomyelitis, healed fracture, and CVI can

Considering the patient's examination at the time of admission, the differential diagnosis includes osteomyelitis and CVI. The patient's laboratory findings were normal, and the preservation of hyperintense medullary bone marrow signal on T1-weighted images led us away from osteomyelitis. Because, in acute osteomyelitis, the bone marrow signal is isointense or hypointense due to infiltration and oedema [5]. In addition, the periosteal reaction, which is a slow growth process, is not expected to occur in the early phase of acute osteomyelitis. The periosteal reaction in osteomyelitis can be seen in the late period and is accompanied by osteopenia and bone destruction in this process. However, there were not present in our patient. Another option is if the patient has chronic osteomyelitis, it can be present with this clinical condition; laboratory findings can be normal and cause a periosteal reaction like this. Chronic osteomyelitis has variable appearances. On radiography, bone destruction, disorganized and ill-defined lucencies can be observed in chronic osteomyelitis. There are also focal osteosclerosis with a lucent rim represents sequestrum, and thickened inhomogenous sclerosis surrounding the sequestrum represents involucrum can be seen [6]. This directed us from chronic osteomyelitis to venous insufficiency because of the absence of these appearances, the more diffuse findings in the tibia and fibula, and presence of phleboliths in the medial side of the cruris. The patient's medical history and performed venous Doppler USG showed that this appearance was due to CVI. Although these two entities should be differentiated due to the different treatment modalities, CVI is also a risk factor for osteomyelitis, and they can coexist. For this reason, the patient's clinical history, laboratory findings, and all data should be well analyzed. The diagnosis should not be made based on laboratory and clinical findings. Laboratory parameters can be normal in chronic osteomyelitis; on the contrary, leukocytosis due to infected ulcer can be seen in chronic venous insufficiency. For this reason, imaging methods must be performed, and, if necessary osteomyelitis should be excluded in the process extending to biopsy. Although CVI is rare, clinicians and radiologists should consider this a possible differential diagnosis.

Written informed patient consent for publication has been obtained.

Differential Diagnosis List: Solid periosteal reaction due to untreated chronic venous insufficiency, Osteomyelitis, Cellulitis, Deep vein thrombosis, Stasis dermatitis, Healed fracture, Osteoid osteoma, Osteosarcoma, Chondroblastoma

Final Diagnosis: Solid periosteal reaction due to untreated chronic venous insufficiency

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Figure 1

a



Description: Solid, thick, undulating periosteal reaction and soft tissue swelling especially in the mid-to distal portion of left tibia and fibula (arrows). Soft tissue calcification, compatible with phlebolith in the medial side of the cruris (tailed arrow) **Origin:** Department of Radiology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara Turkey, 2021

b



Description: Solid, thick, undulated periosteal reaction and soft tissue swelling especially in the mid-to distal portion of left tibia and fibula (arrows). Soft tissue calcification, compatible with phlebolith in the medial side of the cruris (tailed arrow) **Origin:** Department of Radiology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara Turkey, 2021

Figure 2

a



Description: Hyperintense thick periosteal reaction with almost entirely normal bone marrow signal on coronal T1-weighted TSE image (arrows) **Origin:** Department of Radiology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara Turkey, 2021

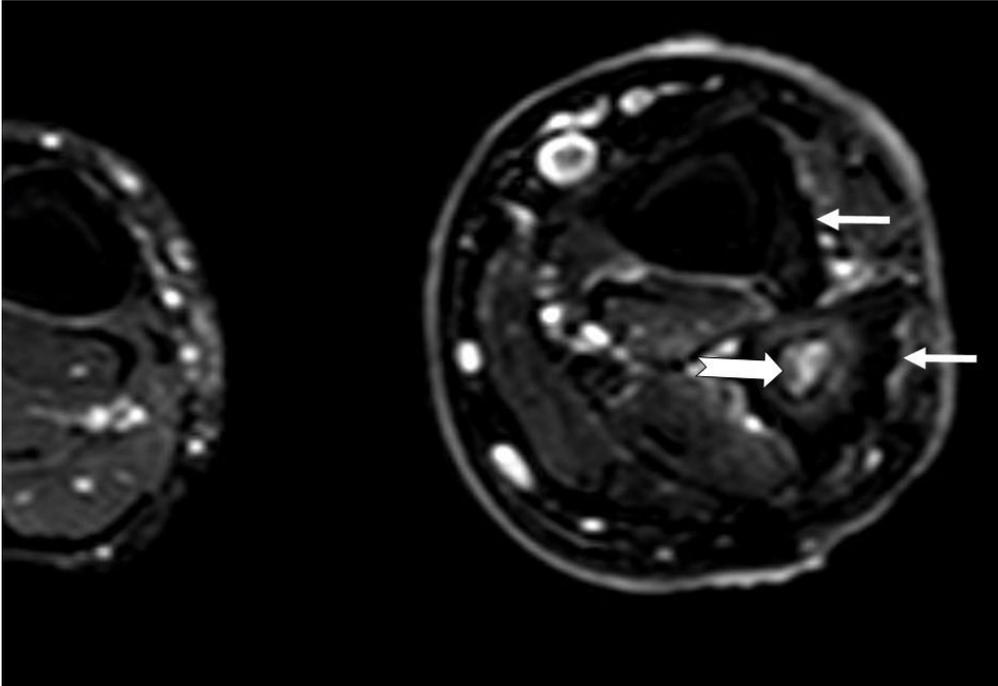
b



Description: Minimal intramedullary bone marrow edema on coronal STIR image (arrow) **Origin:** Department of Radiology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara Turkey, 2021

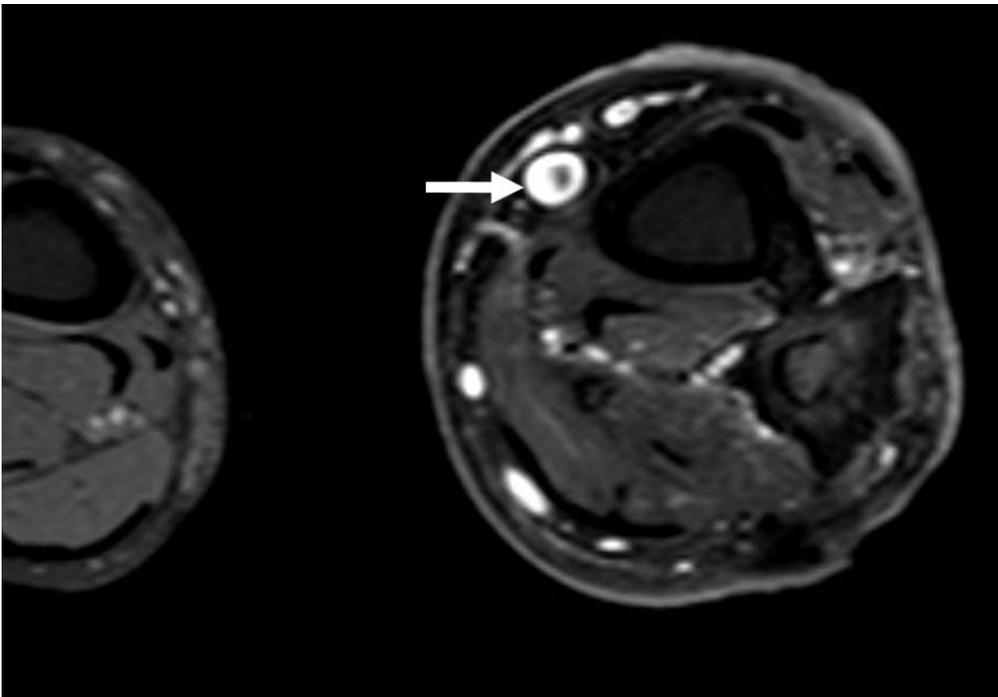
Figure 3

a



Description: Solid, thick, undulated periosteal reaction (arrows) and minimal intramedullary bone marrow edema (tailed arrow) on axial T2-weighted SPAIR image **Origin:** Department of Radiology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara Turkey, 2021

b



Description: Prominent varicose venous vein (arrow) on axial post-contrast T1-weighted TSE image **Origin:** Department of Radiology, Diskapi Yildirim Beyazit Training and Research Hospital, Ankara Turkey, 2021