A 19-year-old male college basketball player experienced onset of pain after playing 4 games in 2 days. Clinical examination revealed mild swelling over the mid-left tibia. There were no signs of infection.

We obtained radiographs (Fig. 1). The radiological differential diagnosis at this stage included focal cortical abscess related to infection, stress fracture and osteoid osteoma. Computed tomography (CT) scans performed for further evaluation showed a focal rounded lytic lesion with a central calcified area and associated cortical thickening (Fig. 2). We observed no cortical breaching. Based on these findings, the radiological differential diagnosis favoured osteoid osteoma.

The patient received nonsteroidal anti-inflammatory drugs for 1 year. Since symptoms persisted, he underwent general anesthesia for CT-guided radiofrequency ablation of the suspected osteoid osteoma. However, there was marked change in the appearance of the lesion on the CT scan performed for localizing during the intervention, with new bone formation and a lucent cleft extending through the bone perpendicular to the axis of the tibia (Fig. 3). What is your diagnosis?
DIAGNOSIS

Stress fracture mimicking an osteoid osteoma

Magnetic resonance imaging (MRI) scans performed to confirm the diagnosis of a stress fracture showed a linear signal abnormality in the region of new bone formation and signal abnormalities of the bone marrow that were less pronounced than would be expected for osteoid osteoma. Magnetic resonance imaging is considered to be the most sensitive cross-sectional imaging modality for the detection of early stress-related injuries of the bone and of stress fractures, especially when short inversion time inversion recovery (STIR) and fast-suppressed T1-weighted pulse sequences are used in addition to standard T1- and T2-weighted MRIs.

The most important diagnostic study for the initial evaluation of stress fractures is plain radiography in 2 planes. However, in early stages, the sensitivity may be as low as 10%, rising to 30%–70% at follow-up. The first radiographic feature seen on plain films is the “grey cortex sign,” an area of decreased density in the cortex. Later, localized endosteal and periosteal reactions can be seen (Fig. 1). Although all these findings might be present, as in our patient’s case, they are not specific. Further evaluation is often needed to differentiate stress fractures from infections or other cortical lesions such as osteoid osteoma.

Plain radiographs obtained as a first diagnostic study should be followed by MRI and/or scintigraphy for the initial evaluation of lesions. Computed tomography may be performed to demonstrate fracture lines not apparent on plain radiographs or in cases where the diagnosis remains unclear after plain radiography and MRI.

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