A 90 year-old female was hospitalized for an acute onset of gout sacroiliitis and localized left buttock pain. She denied any trauma, fever, or skin rash. Her medical background included diabetes type 2, ischemic heart disease, hypertension, hyperlipidemia, obesity, and gout. On examination, her body temperature was normal, her pulse was 86 beats per minute, and her arterial blood pressure was 147/86 mmHg. The patient complained of severe pain during any movement involving her lower back. The maximal tenderness area was localized at the left gluteal region, directly over the sacroiliac joint. Several palpable tophi were noticed over the interphalangeal joints of both hands and toes, and the right olecranon bursa. Laboratory investigation was remarkable for the elevated serum level of C-reactive protein of 184 mg/L (normal up to 5 mg/L) and hyperuricemia 8.4 mg/dl (normal up to 6.8 mg/dl). Otherwise her blood tests, including the general chemistry and blood counts, were unremarkable. Serology test for Brucella was negative. X-ray studies of the pelvis and spine detected widespread degenerative changes, with distortion of the sacroiliac joints. Computed tomography (CT) demonstrated extensive well-defined erosions with sclerotic margins, and in some places overhanging borders, as well as wide sacroiliac joints filled with intra-articular material of different density [Figure 1A]. Dual-energy computed tomography (DECT) scan revealed extensive green colored deposits, consistent with monosodium urate, in the iliac wings, sacrum, ischium, and great trochanter tuberosity, as well as inside the sacroiliac joint space [Figure 1B, Figure 1C]. The diagnosis of acute left sacroiliitis, secondary to gout, was made, and the patient received treatment with prednisone 30 mg once daily, colchicine 1 mg once daily, and allopurinol 100 mg once daily (with recommendation for progressive increased dose).

**COMMENT**

Gout is the most common cause of inflammatory arthritis and it belongs to a group of crystal deposition diseases [1]. Uric acid can crystalize into monosodium urate, especially in the joints and in the surrounding tissues, when its concentration exceeds the saturation level. The crystals are opsonized by macrophages, which causes a local inflammatory reaction involving inflammasome.

Sacroiliitis caused by gout is rarely reported. A recent review of axial manifestations of gout, including its manifestations in the spine and sacroiliac joints, reported only 14 cases of gout sacroiliitis among 142 total cases of axial gout published between 1950 and 2017 [2]. Patients with gout sacroiliitis usually have longstanding and uncontrolled gout disease accompanied by subcutaneous tophi. Pain in the buttock is the most commonly reported clinical manifestation, whether in an acute or chronic mode, and is usually associated with high serum inflammatory markers.

In the last decades, diagnosis of gout has considerably evolved. The diagnosis of gout must be confirmed by positive synovial fluid examination or tissue biopsy for monosodium urate crystals. New imaging techniques have emerged for the diagnosis of gout. According to the latest European League Against Rheumatism (EULAR) recommendations for gout diagnosis, when clinical suspicion cannot be confirmed by fluid analysis, musculo-
skeletal ultrasound is strongly suggested for specific findings such as double contour on the cartilage surface or tophi [3]. However, when the area involved is not accessible by ultrasound, like in the spine and pelvic areas, or when chronic tophaceous gout has caused such anatomical changes that render ultrasound interpretation difficult, DECT is the alternative imaging technique that is most for this situation. DECT is based on the use of two simultaneous different beams (2 different source and level of energy) to determine different material composition [4]. The tophi structure appears to be in a specific coded color, in our case green.

According to several studies performed on peripheral tophi, DECT shows a sensitivity of 0.80–0.97 and a specificity of 0.84–0.95. Those characteristics are less accurate for recent onset disease because it takes time for a crystal deposition disease to accumulate enough tophi, at least 2 mm, to be revealed on the DECT.

One retrospective study showed that regular CT can exhibit specific findings such as multilobular erosions, presence of tophi in 65% of the erosions, well defined sclerotic margins in gouty erosions, para-articular erosion location, and overhanging edges erosions that can distinguish gout sacroiliitis from sacroiliitis of axial spondylarthropathy (SPA). Moreover, widening of the sacroiliac joint space was more frequent in gout, whereas narrowing of the space joint and subchondral sclerosis were more specific to axial SPA sacroiliitis [5]. Yet, regular CT of sacroiliac area cannot differentiate gout sacroiliitis from other etiologies, like septic arthritis of the sacroiliac joint.

Magnetic resonance imaging is not accurate enough to confirm gout sacroiliitis in terms of specific bone lesions or tophus features [4]. The diagnosis of acute gout sacroiliitis should not be based only on DECT images that confirm that tophi of monosodium urate are present in the sacroiliac region. Diagnosis of acute gout sacroiliitis should be made based on a variety of conditions. These conditions include inflammatory buttock pain in the context of polyarticular tophaceous gout or at least long standing hyperuricemia are highly suggestive findings on regular CT of sacroiliac joints with elevated inflammatory markers, and matching images of tophi in sacroiliac joints on DECT.

CONCLUSIONS
Acute gout sacroiliitis should be suspected in patient with severe gout and musculoskeletal pain originating in the axial skeleton. DECT is an elegant imaging technique used to make a definitive diagnosis of gout in these patients. DECT can serve as a diagnostic tool and can help evaluate the true extent and severity of axial manifestation of gout.

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