

Radionuclide imaging and therapy in a patient with coexistent diabetic foot syndrome and psoriatic arthritis

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Abstract

We report a case of 67-year-old man suffering from psoriatic arthritis, type 2 diabetes and diabetic foot syndrome. The patient presented symptoms of inflammation of the right ankle joint. Scintigraphic imaging with radiolabeled white blood cells was performed to differentiate whether the inflammation was related to psoriatic arthritis or diabetic foot syndrome. After revealing that, the inflammatory process was restricted only to the articular space of subtalar joint, the patient was diagnosed with exacerbation of psoriatic arthritis and qualified for radionuclide synovectomy. In patients with coexistent diabetic foot syndrome and inflammatory arthritis of the foot it is of vital importance to accurately differentiate these two conditions. We conclude that this can be potentially achieved with radiolabeled white blood cells scintigraphic imaging.

KEY words: diabetic foot syndrome, psoriatic arthritis, nuclear imaging, radionuclide synovectomy

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Background

Diabetic foot syndrome (DFS) is a serious complication of diabetes mellitus (DM), affecting up to 10% of diabetic patients [1]. It could be potentially life-threatening and thus requires quick, accurate diagnosis and immediate treatment. This proves difficulty, since various forms of DFS (e.g. osteomyelitis or Charcot foot) have often the same initial clinical and radiological symptoms. The problem becomes even more challenging with the presence of a coexistent rheumatic disease affecting joints of the foot.

Case report

We describe a case of a 67-year-old patient suffering from psoriatic arthritis (PsA) for 22 years and type 2 DM complicated by Charcot neuroarthropathy for 15 years. The current treatment is oral methotrexate 25 mg once a week and intensive insulinotherapy. The patient presented symptoms of inflammation of the right ankle joint, with swelling, tenderness and pain. In order to differentiate whether the clinical symptoms were the manifestation of acute Charcot

neuroarthropathy or exacerbation of PsA, the patient was referred to the nuclear medicine department for scintigraphic evaluation.

The single photon emission computed tomography/ computed tomography (SPECT/CT) with technetium-99m labelled white blood cells (^{99m}Tc-WBC) was performed. The study showed intense radiotracer uptake limited to the articular space of the right subtalar joint, with physiological ^{99m}Tc-WBC distribution in the adjacent talus and calcaneus. In the CT scan, massive erosions and degeneration of subtalar joint articular surfaces were visible, with no signs of osteolysis or destruction of the cancellous bone (Figure 1A).

Based on these findings, inflammatory process involving bones was excluded. The patient was diagnosed with psoriatic arthritis of the right subtalar joint and subsequently qualified for radionuclide synovectomy. Under fluoroscopic guidance, the right subtalar joint was punctured from the lateral approach and 37 MBq (mega Becquerels) of colloidal rhenium-186 sulphide were injected.

Within six months after radiosynovectomy, the clinical symptoms of joint inflammation subsided completely. The patient reported overall improvement and better life quality. Follow-up scintigraphic imaging with ^{99m}Tc-WBC showed physiological distribution of the radiotracer, with no signs of active inflammatory process in the joints of the right foot (Figure 1B). Plain radiographs of the right foot showed marked improvement, with partial resolution of bone erosions. Twelve months after radiosynovectomy the patient remains symptom-free.

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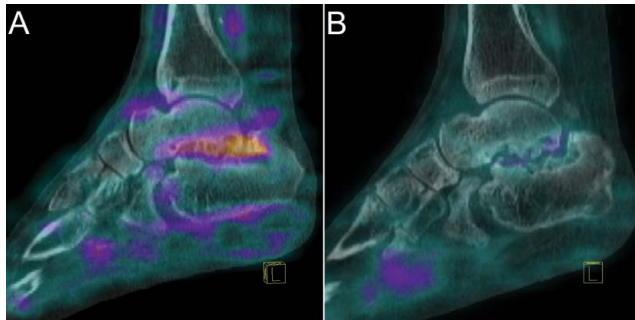


Figure 1. Initial SPECT/CT of the right foot shows intensive accumulation of radiolabeled white blood cells in the subtalar joint (A). Six months after radionuclide synovectomy there is only physiological distribution of radiolabeled white blood cells in the joints of right foot (B)

To the best of our knowledge this is the first report describing a patient with concomitant DFS and inflammatory arthritis of the foot successfully diagnosed and treated using radionuclide techniques.

Discussion

Patients with connective tissue diseases have a significantly increased risk of diabetes mellitus [2, 3]. Additionally, prolonged glucocorticoid therapy in these patients is an independent risk factor of developing steroid-induced diabetes. Populations of diabetic and rheumatic patients overlap and thus we may expect cases with concomitant DFS and arthritis of the foot. In such patients, initial clinical presentation of different foot conditions may be identical, and the results of both plain radiographs and MRI may be equivocal [4]. It is crucial to correctly identify the disease and start appropriate treatment, since misdiagnosis may have catastrophic consequences, e.g. intensifying immunosuppressive therapy in a patient with bacterial osteomyelitis. This is especially important in PsA where the involvement of the foot structures (enthesitis, tenosynovitis, arthritis) is common [5].

Diagnostic modalities of nuclear medicine, especially hybrid SPECT/CT imaging with ^{99m}Tc -WBC could be a valuable tool for

diagnosing different inflammatory diseases of the foot. Although not specific enough to determine the exact cause of inflammation, they can precisely define the extent of the inflammatory process, indicating whether the soft tissues, bones or intra-articular space are affected. Moreover, SPECT/CT imaging can be used to qualify patients for minimally invasive intra-articular procedures like radionuclide synovectomy.

In conclusion, in patients with diabetic foot syndrome and coexisting inflammatory joint diseases, hybrid radionuclide imaging techniques might be considered the diagnostic method of choice. Further studies are required to determine their sensitivity and specificity in this particular clinical setting.

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Conflict of interest

All the authors declare no conflicts of interest.

Ethical standards

All procedures were performed according to Helsinki Declaration.

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