Bone SPECT/CT in the Evaluation of Soft Tissue Calcifications in a Patient with Dermatomyositis

Dermatomyozitli Bir Hastada Yumuşak Doku Kalsifikasyonlarının Değerlendirilmesinde Kemik SPECT/BT

Bone SPECT/CT In Dermatomyositis

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Öz

Dermatomiyozit, nadir bir otoimmün hastalıktır. Dermatomiyozitli hastalarda yumuşak dokulardaki kalsiyum fosfat komplekslerinin birikimi sık görülür. Tüm vücut kemik sintigrafisi (TVKS) yumuşak doku kalsifikasyonunu değerlendirmede kullanılabilir. Yumuşak doku kalsifikasyonunun belirlenmesinde, tedavi ve hastalık aktivitesinin planlanmasında ve izlenmesinde önemli bir rol oynamaktadır. Burada, yumuşak doku kalsifikasyonlarının lokalizasyonu ve yaygınlığını değerlendirmek üzere kemik sintigrafisi için gönderilen dermatomyozitli bir hastanın TVKS ve SPECT/BT bulgularını sunuyoruz.

Anahtar Kelimeler

Dermatomyozit; Sintigrafi; Tek Foton Emisyonlu Bilgisayarlı Tomografi SPECT/BT

Abstract

Dermatomyositis is a rare autoimmune disorder. The accumulation of calcium-phosphate complexes in soft tissues is frequent in patients with dermatomyositis. Whole body bone scintigraphy (WBBS) can be used in assessing the soft tissue calcification. It plays an important role in the detection of soft tissue calcification, planning and monitoring of treatment and disease activity. Here in, we present the findings of WBBS and SPECT/CT in a patient with dermatomyositis who is referred for bone scintigraphy to assessment of localization and extent of soft tissue calcifications.

Keywords

Dermatomyositis; Scintigraphy; Single Photon Emission Computerized Tomography; SPECT/CT

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Introduction

Dermatomyositis is a rare connective tissue disorder characterized by muscle inflammation, symmetric skeletal muscle weakness, and skin rashes. It is occasionally associated with systemic involvement such as dysphasia, polyarthritis and interstitial pulmonary disease. Diagnosis is based on clinical examination, high muscle enzymes and biopsy. The calcifications in soft tissue are frequently seen in patients. Corticosteroids and immunosuppressive agents are used in treatment. The excision of painful calcification areas may be required in some patients [1]. Whole body bone scintigraphy (WBBS) plays an important role in the detection of soft tissue calcification, planning and monitoring of treatment and disease activity [1,2]. Correlation of anatomical and functional findings with Single Photon Emission Computed Tomography/ Computed Tomography (SPECT/CT) is increased diagnostic accuracy of WBBS [3].

We present the findings of WBBS and SPECT/CT in a patient with dermatomyositis who is referred to assessment of localization and extent of soft tissue calcifications.

Case Report

A 77-year-old woman who had progressive muscle weakness, pain and erythematous plaques on her face had been diagnosed dermatomyositis with high muscle enzyme and muscle biopsy in 2006. Corticosteroid therapy was started and decreased patient's complaints. In 2008, methotrexate treatment was added when her complaints increased. When painful hard wounds around the bilateral gluteal regions were occurred in 2014, colchicine therapy was given for calcinosis cutis. Pamidronate and intravenous immunglobuline were started on the exacerbation of dermatomyositis symptoms. The findings of laboratory revealed creatinin kinasez value of 94 U/L (normal value range: 10-171U/L), alanine transaminase of 14 U/L (normal value range: 3-50 U/L), aspartate transaminase of 30 U/L (normal value range: 4-50 U/L), gamma glutamyl transpeptidase of 17 U/L (normal value range: 6-55 U/L), ALP of 43 U/L (normal value range: 30-120 U/L), C-reactive peptide of <0,2 mg/L (normal value range: 0,2-5 mg/L), romatoid factor of 9 IU/mL (normal value range: 0-14 IU/mL), erythrocyte sedimentation rate of 66 mm/h (normal value range: 0-20 mm/h). The extensive myopathy in the proximal and distal skeletal muscle was found by electromyography. Gluteal ultrasonography and abdominal computed tomography revealed the extensive subcutaneous soft tissue calcifications in the bilateral gluteal region and upper thigh, abdomen and pelvis. Bilateral femur magnetic resonance showed the oedematous and infectious changes from proximal to distal thigh. Lithotripsy was planned for the calcinosis cutis. Bone scintigraphy was performed to assess the prevalence and localization of soft tissue calcifications in the whole body before lithotripsy. WBBS was obtained 3 hours after intravenous injection of 740 MBq Technetium-99m Methylene Diphosphonate (Tc-99m-MDP). After the planar bone scan, SPECT/CT was made from the pelvis which was the most intense of soft tissue involvement. Whole body images showed the heterogeneous radiotracer uptake within soft tissue around the right elbow, the bilateral iliac crest and gluteal regions, left knee and right cruris (Fig.1). Due to the excess of soft tissue involvement in the pelvis, the contours of the bone could not be seen in somewhere. In the SPECT/CT study, radiotracer uptakes of pelvic region were seen in the lateral wall of the lower abdomen, lateral of the bilateral iliac crest, both gluteal regions, coxigius and upper inner of both thighs correspond to the irregular diffuse calcification areas within soft tissue (Fig.2). Lithotripsy was not appropriate because of the wide areas of calcinosis cutis according to the findings of whole body scan. The surgical treatment was decided for calcinosis cutis.

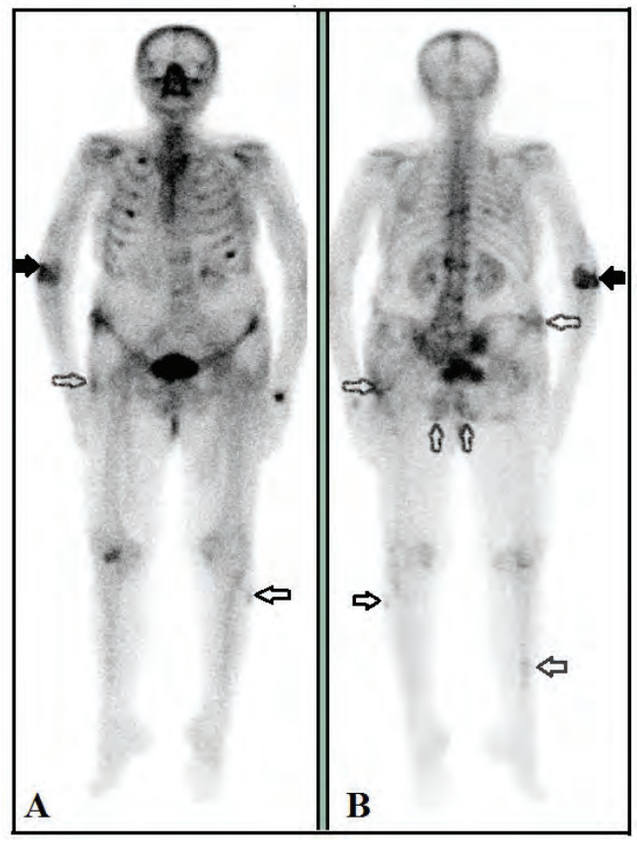


Figure 1: Anterior (A) posterior whole body scintigraphy (B) planar images showed the soft tissue radiotracer uptake right elbow (black arrow), around the bilateral iliac crest and gluteal regions (thin arrows), left knee and right distal tibia (thick arrows).

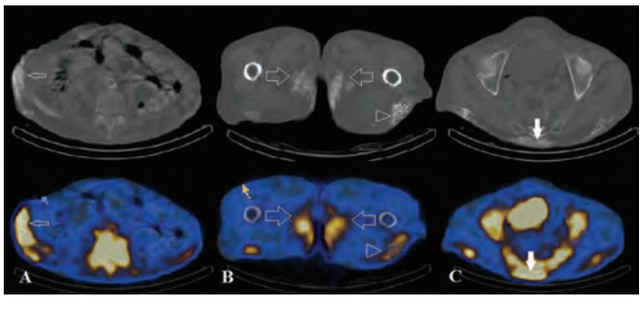


Figure 2: After the whole body scintigraphy, Single emission photon computed tomography was performed to the region of abdomen and pelvis. Axial Computed Tomography and fusion images showed the subcutaneous soft tissue calcification areas associated with nonhomogeneous increased osteoblastic activity in the lower abdominal wall (thin arrows) (A), bilateral proximal thighs (thick arrows), bilateral gluteal regions (triangular) (B), and around the coccygeus (white arrows) (C).

Discussion

Dermatomyositis is chronic inflammatory disease of skeletal muscle. It is thought that the cause of inflammation in the muscles belongs to autoimmune response. As a result of autoimmune damage in the muscles, calcium complexes in the

muscles and soft tissue accumulate in patient with dermatomyositis [1]. Tc-99m phosphonate used in bone scintigraphy may accumulate extra osseous tissue in some conditions such metastatic calcifications, McArdle Syndrome, rhabtomyolisis, myositis ossification, and polydermatomyositis [4-6]. Bone scan can be performed to assess the soft tissue calcifications in the dermatomyositis. There is a correlation between the intensity of radiotracer uptake and disease activity. Therefore bone scintigraphy can be used for management of the patients and evaluation of response to the therapy [4,5,7]. Also all soft tissue involvement from head to feet is evaluated simultaneously with WBBS. Whole-body imaging of patients with conventional imaging methods may not be possible. The addition of SPECT/CT to planar images identifies the accurate anatomic location and extent of radiotracer uptake in bone scintigraphy. Also it may detect more lesion than planar bone scan. It is increased the diagnostic accuracy and specificity of bone scintigraphy [3]. In this case, bone scintigraphy findings were useful for detecting extensive calcification in the whole body. WBBS showed unexpected soft tissue calcinosis in the elbow, left knee and right 1/3 distal tibia without conformity of diagnostic work up. SPECT/CT detected to precise anatomic localization of calcifications and additional calcification areas as bilateral proximal thighs which could not be seen with WBBS [6]. According to the findings of WBBS and SPECT/CT, the planning of therapy was changed. Lithotripsy procedure was abandoned because of extensive calcification areas. Excision of painful calcification regions was decided.

As a conclusion, WBBS and SPECT/CT are useful assessing the soft tissue involvement and calcinosis cutis in patients with dermatomyositis. Bone scintigraphy shows the prevalence of the soft tissue calcinosis as it allows whole body imaging and it changes the patient's treatment.

Competing interests

The authors declare that they have no competing interests.

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