Interesting image

Extensive extra-osseous accumulation of 99mTc-hydroximethylene diphosphonate in a patient with unsuspected dermatomyositis: Whole-body scintigraphy and SPECT/CT

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A 56-year-old male patient was examined in the rheumatology clinic for skin rash involving the chest, weakness in the proximal musculature of arms and thighs and pain and swelling of knees and wrists. A bone scintigraphy was performed to assess the polyarthritis process. Whole-body images showed diffuse and intense uptake of 99mTc-Technetium hydroximethylene diphosphonate (99mTc-HMDP) in the thoracic and pelvic girdle and proximal musculature of arms and thighs, corresponding to the sites of symptomatic muscles. SPECT/CT images helped to localize more precisely the uptake in the muscles (Fig. 1). The patient experienced a rapid progression of the muscle weakness with disability for walking or sitting and was admitted to the hospital. Muscle biopsy showed inflammatory infiltrates and fibre damage. No abnormal calcification was noted. Skin biopsy demonstrated atrophy of the epidermis with vacuolar changes in the basal keratinocyte layer and a perivascular lymphocytic infiltrate in the dermis. Laboratory examination revealed an extremely high CKP value of 11,430 U/l (normal < 170), GOT of 807 U/l (normal < 35) and GPT of 287 U/l (normal < 35). The results of the clinical examination, muscle enzyme analysis and muscle and skin biopsy established the diagnosis of dermatomyositis. The patient was treated with high-dose steroids and a gradual regression of symptoms was obtained.

Dermatomyositis is an idiopathic inflammatory myopathy characterized by symmetric and proximal skeletal muscle weakness and evidence of muscle inflammation.1 It is very often associated with skin manifestations and occasionally with systemic involvement with constitutional symptoms, interstitial pulmonary disease, dysphagia and polyarthritis. Early diagnosis may be challenging due to the overlapping symptoms with other systemic rheumatic diseases.

Bone scan is an important diagnostic tool in the evaluation of osseous abnormalities and bone metastases. Bone-seeking radio- pharmaceuticals may accumulate in many extra-osseous sites due to a variety of conditions. This finding can be decisive for the diagnosis of the patient. Soft-tissue uptake in dermatomyositis is likewise the result of dystrophic calcifications that take place with normal levels of inorganic ions of calcium and phosphorus in the extracellular fluid. This implies that the alteration is of tissue origin due to the creation of favourable conditions. A correlation has been shown between the degree of muscular uptake and the activity of the inflammatory myopathy. Several mechanisms have been considered to explain 99mTc-phosphonate muscular uptake: hyperaemia and altered capillary permeability due to the inflammatory process; new bone formation and tracer adsorption to calcified tissue; concentration in infarcted tissues due to adsorption to calcium ions present in high concentration in necrotic cells; or binding to hydroxyapatite and calcium phosphate crystals in ischaemic tissues.2,3

This report shows that although extra-osseous accumulation of 99mTc-phosphonates is usually an incidental finding without relevance in the diagnosis work up, occasionally, soft-tissue uptake may add helpful information and even suggest a pathology not considered in the clinical evaluation of a patient. To recognize the different patterns of extra-osseous uptake and understand their causes, it is essential to determine whether these findings contain useful diagnostic information.

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Figure 1. $^{99m}$Tc-HMDP whole-body scan showed intense and diffuse soft tissue tracer uptake in the thoracic and the pelvic girdle and in proximal musculature of arms and thighs. Diffuse and mild radiotracer uptake was observed in both lower and upper limbs. The deposits of radiotracer corresponded to the sites of symptomatic muscles exhibiting pain and weakness and appeared during the acute phase of the illness. Thoracic SPECT/CT images helped to precisely delineate the site of non-osseous uptake. No calcification was noted in the muscles in the CT component of the SPECT/CT (A: whole-body scan; B: fusion; C: SPECT; D: CT images in axial views).

References

