The precise localization of metastatic lesion with used SPECT/CT with CoDe system after 131I – MIBG therapy in patients with disseminated pheochromocytoma

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Szalus N. [1], Podgajny Z. [2], Kaminski G. [3], Mazurek A. [1], Giżewska A. [1], Dziuk E. [1].

[1] Department of Nuclear Medicine,Military Institute of Medicine, Warsaw, Poland
[2] Department of Endocrinology and Radioisotope Therapy2 - Military Institute of Medicine, Warsaw, Poland
[3] Department of Endocrinology and Radioisotope Therapy - Military Institute of Medicine, Warsaw, Poland

nszalus@wp.pl

Introduction: Pheochromocytoma is a rare tumor that originates from chromaffin cells such as the adrenal medulla and sympathetic ganglia. Malignant pheochromocytoma is uncommon, and metastases typically affect the bones, liver, lungs, and lymph nodes. Meta-iodo-benzyl guanidine (MIBG) is a norepinephrine analog, and 131I- and 123I-MIBG have been widely used for the diagnosis of pheochromocytoma. This technique has high specificity and detectability not only for primary tumors but also metastatic lesions when compared with morphologic imaging such as computed tomography (CT) and magnetic resonance imaging (MRI). Co-registered data have been shown to be useful in the evaluation of patients with cancer at diagnosis and staging, in monitoring the response to treatment, and during follow up, for early detection of recurrence. Gamma camera with CoDe system is a new modality to the PET/CT and SPECT/CT imaging to the precise localization metastatic lesions.

Aim of study: The aim of this study is to investigate the precise localization 131-MIBG with used SPECT/CT CoDe system for metastatic diseases in patients with malignant pheochromocytoma.

Material and methods: Two patients with disseminated pheochromocytoma (the first patient with metastases to the liver, bones and lung; the second with metastases to the bone) were referred for study. Routine whole body scan with I-131 was performed with a dual head gamma camera (Infinia Hawkeye General Electric Milwaukee with CoDe system, USA) using a large field of view with high energy collimator a 20 % energy window centered at 364 keV and, 1024 x 512 matrix. The data acquisition was performed 72 hours after 131-MIBG therapy. Whole body anterior and posterior views were obtained. SPECT images of thorax and abdomen were obtained with 45 sec/frame, 60 projections, 20 % window centered at 364 keV, matrix size of 128 x 128 and zoom factor of 1.0. This was followed by CT acquisition using single slice (1 cm thickness). Using volumetrix software in Xeleris, fused images in coronal, sagittal and transaxial views were then obtained. Whole body planar images were first interpreted alone. Then, they were reassessed with the addition of SPECT/CT coregistered images.

Results: 1. In these patients SPECT/CT revealed 30 % more pathological lesions than planar studies alone. 2. SPECT/CT provided precise anatomical localization not clearly evident in planar images alone. 3. It also enabled exclusion of disease in sites of physiologic tracer deposition found suspicious in planar studies alone

Conclusion: SPECT/CT allows more precise localization and interpretation of 131I-MIBG whole body scan thereby improving its diagnostic accuracy. It also has impact on correct restaging after therapy with 131I-MIBG preparation.

References:

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