Focal myocardial uptake in a patient with carcinoid tumor by indium-111-pentetreotide on SPECT/CT

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Abstract.—We present a case of a 44 year old man with flushing, diarrhea and markedly elevated 24 hour urinary 5-HIAA level, who was referred for an indium-111 pentetreotide study, after the excision of a carcinoid tumor in the terminal ileum. Scan findings revealed focal uptake in the myocardium and liver, suspicious for metastases. Subsequent transthoracic echocardiogram failed to demonstrate a cardiac lesion. Previously, our group has unequivocally demonstrated the usefulness of software fusion of SPECT and CT imaging in the evaluation of a carcinoid metastasizing to the myocardium. This case illustrates that hardware SPECT/CT fusion imaging utilizing indium-111 pentetreotide to evaluate metastatic carcinoid tumors can be useful. In addition, the echocardiogram can yield false negative results, because of a smaller lesion size and the influence of an operator-dependent factor.

KEY WORDS: carcinoid tumor, indium-111 pentetreotide, SPECT/CT, false negative, cardiac metastasis.

CASE REPORT

44 years old man with flushing and diarrhea for 3 months and markedly elevated 24 hour urinary 5-HIAA level was referred for an indium-111 pentetreotide study, after the excision of the primary disease in the terminal ileum, which proved to be carcinoid on biopsy.

4 hours whole body planar anterior and posterior images (fig. 1A) were obtained using a dual detector...
gamma camera (Precedence SPECT/CT, Royal Philips Electronics, Andover, MA), post intravenous administration of 5.9 mCi of indium-111 pentetreotide, demonstrated multiple foci of abnormally increased radiotracer uptake in the liver, which were confirmed to be metastases on subsequent resection. Physiologic radiotracer activity is seen in the thyroid gland, spleen, kidneys and urinary bladder. 24 hours whole body planar anterior and posterior images (fig. 1B) showed a curvilinear focus of increased radiotracer uptake in the right lower abdominal quadrant, which was not visualized on the 4 hours images, suggestive of physiological gastro-intestinal activity. In addition, abnormal foci of increased tracer uptake in the liver, and a focus of increased tracer uptake was seen in the left lower thoracic zone, just superior to the left hemidiaphragm. This focus was further investigated with hardware fused SPECT/CT imaging (Precedence SPECT/CT, Royal Philips Electronics, Andover, MA), of the chest and abdomen. 24 hours transaxial (A), sagittal (B), and coronal (C) SPECT/CT images delineated this focus of tracer uptake to the apical region of the right ventricle/interventricular septum, and multiple foci in the liver, suspicious for metastases from the carcinoid tumor.

DISCUSSION

Carcinoid tumors are rare, the incidence is 1.2-2.1/100,000 people/year. Although rare, aggressive and metastatic disease can occur. 2-20% of metastatic cancer can metastasize to the myocardium, with breast, lung and malignant melanoma being the most frequent primaries. There is a 4% overall incidence of myocardial carcinoid metastases in patients with metastatic carcinoid disease. In this case, the transthoracic echocardiogram did not demonstrate an intracardiac mass or thrombus corresponding to the focal uptake in the myocardium on the indium-111 pentetreotide scan. Previously, it has been reported that metastatic carcinoid tumor has echo characteristics that make it easily identifiable when it is 1.0 cm or larger, and the focus in our case is subcentimeter, which likely renders it difficult to be seen on the echo. In addition, the echocardiogram is operator-dependent, and echocardiograms by less experienced ultrasonographers can, in some cases, yield false negative findings.

This case illustrates that SPECT/CT fusion imaging utilizing indium-111 pentetreotide to evaluate metastatic carcinoid tumors can be useful, and, on occasion, the echocardiogram may yield false negative results in lesions that are smaller than 1 cm, and also because of the introduction of an operator-dependent factor. Image co-registration (fusion) techniques offer the advantage of combining the high-resolution anatomic images from CT with the functional strength of nuclear medicine images.

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RESPUESTAS CORRECTAS
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1 - D  
2 - E  
3 - B  
4 - C  
5 - E  
6 - E  
7 - D  
8 - D  
9 - C  
10 - C