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PHYSIOLOGICAL JOINT PITFALL AND MISINTERPRETATION OF PET/CT DOPA SCAN

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BACKGROUND-AIM

18F-DOPA PET/CT is increasingly being used in the evaluation of neuroendocrine tumors, although the standardization of protocol acquisition is still missed. The aim of this study was to retrospectively determine the rate of false positive DOPA PET/CT at bone level, in a cohort of 148 patients.

METHODS

Between December 2012 and July 2014, we retrospectively re-viewed 148 18F-DOPA PET/CT scans in patients with known or suspected neuroendocrine tumors. PET/CT was performed after the injection of 3 MBq/Kg of 18F-DOPA, and the acquisition was started 60 minutes later. All images were interpreted by an expert nuclear medicine physician and later re-analyzed by a second physician. Co-registered CT images were used for assessing the presence of a malignant or a benign bone lesion.

RESULTS

Out of 148 PET/CT scans, 67 were negative while the residual 81 resulted positive (45.2% and 54.7%, respectively). In 31 patients (21%), PET/CT showed an abnormal uptake in the joints. Eleven out of 67 (16.4%) patients with a negative scan had a significant uptake in the joints versus 20/81 (24.7%) subjects with a positive scan. In 10/31 cases (32.3%), DOPA-uptake was reported in acromion-clavicular joints; whereas in 26/31 (83.4%), it was seen in the vertebral joints, mostly at cervical and thoracic levels (n=12; 46%). In the selected patients, the clinical indications were known or suspected pheochromocytoma (n=5; 16.1%), medullary thyroid cancer (n=13; 41.9%), multi-endocrine familiar syndromes (n=5; 16.1%) and known or suspected neuroendocrine neoplasia (n=8; 25.8%). Finally, in these 31 patients, a malignant bone involvement was depicted in only 5 cases.

CONCLUSION

The interpretation of 18F-DOPA PET/CT appears extremely important, because the rate of false positive findings can be high, both in negative and in positive scans, ranging between 15% and 25%. A misinterpretation can be avoided by a careful lecture of co-registered CT images.