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Somatostatin Receptor Expression in Lung Neuroendocrine Tumors: An Analysis of Dotatate PET Scans

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BACKGROUND

Somatostatin receptor (SSTR) expression in metastatic lung neuroendocrine (carcinoid) tumors has not been well-characterized using modern positron emission tomography (PET) imaging. Understanding degree and uniformity of SSTR expression is important to establish the role of SSTR targeted treatments, including peptide receptor radiotherapy (PRRT), in lung NETs.

METHODS

Retrospective review of medical records and imaging studies of patients with metastatic lung NETs who underwent Dotatate PET imaging (^{68}Ga or ^{64}Cu) at Moffitt Cancer Center since introduction of Dotatate PET CTs in 3/2017 through 2/2022.

RESULTS

A total of 22 patients were identified with metastatic lung NETs (3 typical, 19 atypical) who underwent either ^{68}Ga or ^{64}Cu Dotatate PET imaging. 3 patients had complete absence of SSTR expression and 1 patient very weak expression (less than normal liver). Among the remaining 18 patients, only 8 had uniformly positive Dotatate PET scans whereas 10 patients had heterogenous expression (mix of SSTR positive and negative tumors). 2 of the typical (low-grade) NETs had positive uniform SSTR expression and the 3rd (with low mitotic rate but ki67 of 10%) had heterogeneous expression. In total, only 8/22 patients (36%) had uniformly positive receptor expression which would render them candidates for treatment with PRRT.

CONCLUSIONS

The majority of metastatic lung NETs are either SSTR negative or express heterogenous patterns of SSTR expression and are thus suboptimal candidates for SSTR targeted therapy, particularly with PRRT. SSTR imaging in lung NETs should be evaluated carefully for uniformity of expression.

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