神經內分泌腫瘤：核醫運用

Neuroendocrine tumor: Nuclear medicine application 2018

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Neuroendocrine tumors (NETs) are epithelial neoplasms with predominant neuroendocrine differentiation. NETs are curable by surgical resection if the disease extension is limited. Because of its insidious causes, half of the disease is found with metastatic sites. The median survival of localized NET patients reaches almost ten years, but in those with distant metastases, the median survival is only 33 months. Conventional images for neuroendocrine tumors include computer tomography, magnetic resonance imaging and endoscopic ultrasounds. These anatomy-based imaging methods sometimes have difficulty in identifying small NET lesions. The abundant expression of somatostatin receptors (SSTR) is a characteristic of NETs. In most cases, SSTR subtype 2 is overexpressed. Octreotide, a synthetic somatostatin analog, was radiolabeled allowing SSTR imaging with a nuclear medicine camera. Indium-111 (In-111) Octreoscan has been performed to evaluate the whole body extension of NETs for several decades. In-111 Octreoscan is imaged with single photon emission tomography (SPECT), a traditional method of nuclear medicine. Nowadays, positron emission tomography (PET) provides higher resolution and sensitivity than SPECT. Therefore, the role of In-111 Octreoscan is gradually replaced by gallium-68 (Ga-68) tracers such as Ga-68 DOTATATE, Ga-68 DOTATOC, Ga-68 DOTANOC, ect. The use of SSTR PET/CT allows not only identification of tumor heterogeneity, but also optimal patient managements, including the theranostic application of peptide receptor radionuclide therapy.