

▶ Current Status of F-18 DOPA Imaging in Neuroendocrine Tumours

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Neuroendocrine tumors (NET) are a diverse group of malignancies with a world-wide increase of incidence¹. Because of their usually small size and multiplicity, correct diagnosis is often difficult to determine. Early and accurate staging of NET is necessary for correct therapy plan and better prognosis. Functional nuclear imaging has been of great significance in patient management, and somatostatin receptor scintigraphy (SRS) using single photon emission computed tomography (SPECT), with Tc-99m labeled somatostatin analogues or In-111-pentetreotide is one of the most common nuclear medicine imaging studies. Better resolution and uptake quantification provided by positron emission tomography (PET) introduced several tracers for a more effective imaging of NETs, most commonly F-18-dihydroxyphenylalanine (FDOPA), C-11 labeled 5-hydroxytryptophan (5-HTP) and Ga-68 labeled somatostatin analogues². The FDOPA pathway and its physiological distribution has been known and presented, and it is used in the assessment of hyperinsulinism, staging of NET and evaluation of movement disorders (i.e. Parkinson's disease).

Functional imaging diagnostic with FDOPA usually is proposed due to the rising of tumor markers levels or equivocal findings of other imaging methods (i.e. ultrasound, MSCT or MRI). In accordance with the relevant guidelines, after a 4 hour fast, approximately 2-2,5 MBq/kg BW activity is generally administered.

Many publications showed a high F-18 DOPA detection rate, superior to conventional nuclear imaging methods, as well as standard CT and MRI imaging. It provides a high sensitivity and a high background to target ratio. Decreasing uptake over a short period of time³ and an on-site final tracer preparation may be a hindrance in regular clinical use. Comparing with other imaging modalities used in patient with NET (CT, MR, bone scintigraphy, Octreoscan, or Tc-99m-DMSA V scintigraphy), F-18 DOPA was found to be most sensitive in discovering various, previously unknown disease locations, especially for medullary carcinoma^{4,5,6}.

Conclusions. F-18-DOPA PET/CT is a valuable functional diagnostic imaging method for staging and restaging neuroendocrine tumors. The scan report is of considerable use in patient management, changing treatment modalities and improving quality of life.

References:

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Oct. 17