Scottish Clinical Imaging network

NHS National Services Scotland

Indications for the use of ^{68}Gallium DOTA PET CT (^{68}Ga DOTA) in Neuroendocrine Tumours

Background

Somatostatin Receptor Scintigraphy (SRS) is a well-established imaging tool in the diagnosis and management of Neuroendocrine tumours (NETs) and was traditionally performed using ^{111}In-Octreotide and ^{99m}Tc-Tektroyd. The development of PET radiopharmaceuticals offers the benefit of improved resolution capabilities of PET together with the greater receptor affinity of the peptide component resulting in the potential for more accurate staging and disease delineation.

The Scottish Government approved funding in 2019 to develop ^{68}Ga DOTA services at all four Scottish PET CT centres. Although it may be preferential to replace SRS with ^{68}Ga DOTA the availability of tracer is likely to remain limited. As a result, it is expected that SRS will have a continued role in the management of patients with ^{68}Ga DOTA being considered where it is felt to add additional benefit. Therefore, all referrals should come via (or in discussion with) the regional NET MDTs.

This guidance was originally published in 2020 and has been reviewed and updated as part of a planned review process. There has been no significant change to the evidence base and therefore the agreed indications remained unchanged.

^{68}Ga DOTA, as with all PET referrals, should only be considered where the outcome of the investigation will directly influence individual patient management and treatment.

Routine Indications

- **Gastroduodenal Neuroendocrine Neoplasms (GNENS):**
  - Type 3- GNEN- when staging CT/laparoscopy inconclusive in patients being potentially considered for radical surgery.

- **Jejunal/Ileal NENS**
  - Staging of patients with small bowel NET being considered for surgery
  - Post op staging in patients presenting with small bowel obstruction secondary to small bowel NET
  - Staging of patients with metastatic disease considered for treatment with curative intent e.g. Hepatic metastases.
  - Suspected tumour (clinical/elevated urinary 5-HIAA/serum CgA) with negative conventional imaging.

    - Suspected biochemical recurrence or progressive disease with negative/stable conventional imaging

- **Pancreatic NENS**
    - Localisation of functional (non Insulinoma) NENS not identified on CT/MRI/EUS.
    - Staging of Gastrinoma and other rare functional tumours (RFT).
    - Patients being considered for radical surgery (other than Insulinoma).

- **G1/2 Colorectal NEN**
    - When CT/MRI demonstrates possible/definite metastatic disease which would be suitable for treatment with curative intent.

- **Appendiceal NEN**
    - G1/2 disease with suspected/ definite metastatic disease on CT/MRI in patients with tumours >2cm and or with deep mesoappendiceal infiltration or angioinvasion.

- Metastatic NET of unknown primary being considered for treatment with curative intent

- Patients being considered for PRRT

- Staging of bronchial carcinoids in patients being considered for radical surgery

- Medullary thyroid cancer with increasing calcitonin and negative/equivocal conventional imaging

- Clinically or biochemically suspected paraganglioma/phaeochromocytoma with negative or equivocal imaging including MIBG

Non-routine

- Somatostatin receptor status should, in the first instance, be assessed using SRS with ^{68}GA DOTA only be considered in exceptional cases (unless in conjunction with the indications above).

Future Considerations

It is the aim that as services become more established ^{68}Ga DOTA will become the routine investigation of choice for NETs. However, the availability of tracer may remain limited and ongoing assessment of resource availability and clinical need will be required to guide service development. There is currently insufficient evidence to support the use of ^{68}Ga DOTA in the follow up of patients treated with PRRT at present but will be subject to further review in future. The ongoing development of other ^{68}Ga labelled tracers as well as ^{18}F fluorinated versions will also be kept under review.

References

Delle Fave G, O'Toole D, Sundin A, Taal B,Ferolla P, Ramage JK, Ferone D, Ito T, WeberW, Zheng-Pei Z, De Herder WW, Pascher A,Ruszniewski P; all other Vienna ConsensusConference participants: ENETS consensus guidelines update for gastroduodenal neuroendocrine neoplasms. Neuroendocrinology 2016; 103:119–124.

Niederle B, Pape UF, Costa F, Gross D, Kelestimur F, Knigge U, Öberg K, Pavel M, Perren A, Toumpanakis C, O'Connor J, O'Toole D, Krenning E, Reed N, Kianmanesh R; all other Vienna Consensus Conference participants: ENETS consensus guidelines update for neuroendocrine neoplasm of the jejunum and ileum. Neuroendocrinology 2016; 103:125–138.

Ramage JK, De Herder WW, Delle Fave G, Ferolla P, Ferone D, Ito T, Ruszniewski P, Sundin A, Weber W, Zheng-Pei Z, Taal B, Pascher A; all other Vienna Consensus Conference participants: ENETS consensus guidelines update for colorectal neuroendocrine neoplasms. Neuroendocrinology 2016; 103:139–143.

Pape UF, Niederle B, Costa F, Gross D, Kelestimur F, Kianmanesh R, Knigge U, Öberg K, Pavel M, Perren A, Toumpanakis C, O'Connor J, Krenning E, Reed N, O'Toole D; all other Vienna Consensus Conference participants: ENETS consensus guidelines for neuroendocrine neoplasms of the appendix (excluding goblet cell carcinomas). Neuroendocrinology 2016; 103:144–152.

Falconi M, Eriksson B, Kaltsas G, Bartsch DK, Capdevila J, Caplin M, Kos-Kudla B, Kwekkeboom D, Rindi G, Klöppel G, Reed N, Kianmanesh R, Jensen RT; all other Vienna Consensus Conference participants: ENETS consensus guidelines update for the management of patients with functional pancreatic neuroendocrine tumors and non-functional pancreatic neuroendocrine tumors. Neuroendocrinology 2016; 103:153–171.

Pavel M, O'Toole D, Costa F, Capdevila J, Gross D, Kianmanesh R, Krenning E, Knigge U, Salazar R, Pape UF, Öberg K; all other Viennam Consensus Conference participants: ENETS consensus guidelines update for the management of patients with distant metastatic disease of intestinal, pancreatic, bronchial neuroendocrine neoplasms (NEN) and NEN of unknown primary site. Neuroendocrinology 2016; 103:172–185.

Garcia-Carbonero R, Sorbye H, Baudin E, Raymond E, Wiedenmann B, Niederle B, Sedlackova E, Toumpanakis C, Anlauf M, Cwikla JB, Caplin M, O'Toole D, Perren A; all other Vienna Consensus Conference participants: ENETS consensus guidelines for high-grade gastroenteropancreatic neuro endocrine tumors and neuroendocrine car cinomas. Neuroendocrinology 2016; 103:186–194.