177Lutetium-DOTA TATE
Treatment of inoperable GEP NETs

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• Patient: 50-year old female

• Clinical history: the patient was diagnosed with a well-differentiated neuroendocrine carcinoma of the pancreas with liver metastases and extensive tumor involvement of mediastinal and retroperitoneal lymph nodes.
Subcarinal (A) and retrocrural (B) lymph node involvement
Retroperitoneal (C) lymph node involvement and tumor mass (D) in head of pancreas
Digitized MIP images obtained from a hard copy provided by the patient. The study was performed in an external institution.

Baseline somatostatin receptor scintigraphy
Indium-111 DTPA- Phe¹-octreotide
Activity: 5 mCi

There is extensive abnormal uptake in intrathoracic and retroperitoneal lymph nodes.
The tumor was considered inoperable by the board of neuroendocrine tumors treatment and palliative treatment was approved with 600 mCi of Lu-177 DOTA TATE divided in 200-mCi cycles every 6-10 weeks.
Interval response to therapy. Baseline dosimetry scan (A) obtained with a low dose of the radioligand. There is significant interval change between the first (B) and second (C) post therapy scans obtained with a 3-mo difference. Further response is noticed in the final post therapy scan, obtained almost 6 months after the start of treatment.
$^{99m}\text{Tc-Hynic-Tyr}^3\text{-octreotide}$. Selected coronal and sagittal half-body SPECT images obtained at 4 hours post injection.

End of treatment. After three therapy doses of $^{177}\text{Lu-DOTA TATE}$ there is residual focal uptake in the head of the pancreas. Significance reduction of uptake in retroperitoneal lymph nodes is noted.
CT follow up. The baseline lesion in the head of the pancreas is no longer evident at 6 months post therapy. Residual retroperitoneal lymph nodes are less than 1 cm.
Comparison between end of treatment (Feb/09) and 13 mo. follow up MRI. Interval disappearance of retroperitoneal lymph nodes is noted.
Results

- A significant response to treatment was evident after only two cycles of $^{177}$Lu-DOTA TATE.

- At the end of treatment the final response was deemed partial by RECIST standards, as there were residual paraaortic lymph nodes and a 3-cm mass in the head of the pancreas.

- 6 months after the last treatment cycle the mass at the head of the pancreas had disappeared and significant reduction in retroperitoneal lymph node involvement was noted.
Therapy with 177Lutetium DOTA TATE can be useful for inoperable, metastatic GEP NETs.

The rate of complete responses obtained by Kwekkeboom et al was only 2% in patients treated with $^{177}$Lu-DOTA TATE. They reported partial responses, minor responses, stable disease and progressive disease, respectively, in 26%, 19%, 35% and 15% of their patients.

Treatment tolerance was good, significant reduction of symptoms was obtained and 2-yr survival rate was 76 ± 16%.

Predictors of good response include: high uptake of lesions in somatostatin receptor scintigraphy and Karnofky’s performance status > 70%.

Predictors of poor prognosis include: massive liver involvement, bone metastases and Karnofky’s index < 70%.