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## An Initial Experience in Establishing a Theranostic Precision Medicine PRRT Targeted Radiotherapy Program for the Treatment of GEP-NETs with Lu-177 Dotatate (Lutathera) in a Major Academic University Hospital.



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**BACKGROUND:** Implementation of a Post Therapy Whole Body and SPECT-CT Scanning Protocol of All Patients After Each Round of Lu-177 Lutathera Treatment Provides Early Insight into Treatment Response.

Lu-177 dotatate (Lutathera) is a targeted peptide receptor radionuclide therapy (PRRT) indicated for the treatment of somatostatin receptor expressing gastroenteropancreatic neuroendocrine tumors (GEP-NETs). Patients receive a total of 4 treatments over a span of 8 months. Per standard regimen, patients undergo a baseline Ga-68 Dotatate PET scan followed by a repeat PET after the completion of therapy as assessment of therapy efficacy. We hypothesize acquiring post-therapy whole-body scans (WB) and SPECT-CT images on patients after each round of PRRT may provide early insight in differentiating treatment responders from non-responders.

**METHODS:** A total of 43 patients received PRRT and subsequently underwent WB and SPECT-CT imaging 48-96 hours post treatment on a SPECT/CT. All patient WB scans were done with a 208 keV energy peak with a 20% window and a scatter window of 112 keV with a 25% window. WB scans were acquired with continuous acquisition at 10 cm/min.

The SPECT scan was acquired at 25 sec/stop with 3 degrees of rotation between stops followed by a low dose CT for localization/attenuation correction. All images were processed and reviewed by an experienced reader.

**RESULTS:** Serial scanning of patients after each round of PRRT differentiated responders from non-responders as determined by interval visual assessment of change in lesion volume or intensity, as well as increase or decrease in the total number of lesions. This provides the potential for early determination of treatment responders from non-responders.

**CONCLUSION:** Serial scanning of patients after each round of PRRT can provide early differentiation of treatment responders from treatment non-responders potentially providing an effective method for disease monitoring and evaluating the efficacy of treatment. This can help optimize the patient's personalized treatment strategy.

**ABSTRACT ID:** 173