

Canadian Radiotheranostics Leaders' Summit 2025

Abstract Submission

Title: Efficacy of ^{177}Lu -DOTATATE in Neuroendocrine Cancer of the Cervix Resistant to Conventional Systemic Therapies

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Abstract:

Purpose:

Neuroendocrine carcinomas (NEC) are highly aggressive tumours with limited treatment options and poor prognoses. Peptide receptor radionuclide therapy (PRRT) with ^{177}Lu -DOTATATE has shown promise in well- to moderately-differentiated neuroendocrine tumours, but its role in NEC remains unclear. We hypothesized that NEC cervix demonstrating overexpression of somatostatin receptors may benefit from PRRT. We report our first experience of two patients with metastatic NEC of the cervix who has progressed on standard treatment.

Methods:

Two patients with recurrent metastatic NEC of the cervix post standard of care systemic therapies underwent 68Ga DOTATATE scans. Upon demonstration of overexpression of somatostatin receptor type 2 (SSTR-2), 177Lu-DOTATATE was initiated. Their clinical course (patient A and B) were extracted retrospectively.

Results:

The mean age of both patients were 31 years, pathology showed high grade adenocarcinoma with neuroendocrine differentiation and neuroendocrine carcinoma respectively, both with high Ki67 (50-90%). Both presented with locally advance disease treated with surgery, radical chemoradiotherapy (CRT) with cisplatin, brachytherapy followed by adjuvant chemotherapy. Mean time to first metastases was 15 months. Both received three line of systemic therapy including targeted therapy and phase I clinical trials. Prior to PRRT, both patients were ECOG 2 with significant symptoms (fatigue, pain, weight loss and other metastases specific symptoms). Patients underwent Ga68 DOTATATE scan confirming Krenning 3-4 (SUVmax uptake ranged 7.4 to 29.2). Case A also had FDG PET scan which showed relatively higher uptake in the liver lesions as compared to Ga68 DOTATATE scan, in keeping with NETPET P4. Case A received 2 cycles (2nd cycle delayed due to thrombocytopenia) and case B received 4 cycles (nominal dose of 200mCi per cycle). By approximately 6 weeks post cycle 1, both patients reported improvement in their symptoms. CT scans showed decrease of tumor lesions at 9 weeks (A) and 14 weeks (B) post cycle 1. Duration of disease control was 13 and 30 weeks respectively. Treatment was well tolerated. Patient A had Grade 2 thrombocytopenia and anemia; Patient B had Grade1 lymphopenia. Individualized dosimetry (Patient B only) showed cumulated radiation dose absorbed of Liver 76.9Gy & 52.5 Gy (extrahepatic). Patients died of progressive disease at 1 and 4 months post last cycle of PRRT (2.3 & 6 years post first diagnosis).

Conclusions:

Ga68 DOTATATE PET demonstrated somatostatin overexpression in two patients with cervical cancer and high grade neuroendocrine carcinoma features. 177Lu-DOTATATE provided clinically meaningful symptomatic benefits as well as tumor response, suggesting interest for this therapeutic option when no other treatment were available. Further studies should be considered to assess activity, potentially in combination of other modalities. A prospective pathway for systematically assessing neuroendocrine carcinomas through UNIQUE protocol is in progress.