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Is There a Role for Radiation for Neuroendocrine Neoplasm Hepatic Metastases?

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Background: The liver is the most common metastatic site for neuroendocrine neoplasms (NEN). Its presence is a major prognostic factor. While stereotactic body radiotherapy (SBRT) and standard external beam radiotherapy have been successful in treating non-neuroendocrine hepatic metastases, it has not been incorporated into NEN hepatic metastases management. This study investigates radiation's potential role in treating NEN hepatic metastases.

Methods: Four patients with hepatic metastases from advanced gastrointestinal NEN were prospectively identified and treated with SBRT. Radiation treatment method consisted of respiratory-gated simulation and treatment, individualized dosing with radiobiological calculation of normal tissue complication probability.

Results: One patient with hepatic metastases from a gallbladder primary was only able to receive low-dose radiation (3000 cGy/10). She died of in-field recurrence 5 months post-SBRT. Two patients, one with hepatic metastases from a functional, well-differentiated, 5-HIAA positive, neuroendocrine small bowel carcinoma, and another with hepatic metastases from a well-differentiated, non-functional, pancreatic neuroendocrine carcinoma achieved progression-free, stable disease after being treated with 4200 cGy/6, and 5574 cGy/6 of SBRT, respectively. Both remain alive 3.5 years post-SBRT. The fourth patient was treated with SBRT for hepatic metastases from esophageal NEN without major toxicity, and remains alive more than 2 years post-SBRT. However, status of his disease and local control are unknown, as he was lost to imaging follow-up. Overall, no grade 2, 3, or 4 toxicities were observed.

Conclusion: External beam radiation for NEN liver metastases appears to be well tolerated, and may achieve disease stability for a substantial period of time. While it is a small case series with a heterogeneous patient group, this represents the first case series of SBRT for NEN hepatic metastases, and the results are encouraging. The effectiveness of SBRT for NEN hepatic metastases, progression-free survival, control of tumor functionality, and determination of selection criteria warrants further investigation.