

Results of Liver-Directed Surgery in Neuroendocrine Metastases: Support for Use of Parenchymal-Sparing Debulking Procedures

Jessica E. Maxwell MD MBA¹; Scott K. Sherman MD¹;
Thomas M. O'Dorisio MD¹; Andrew M. Bellizzi MD²;
James R. Howe MD¹

¹University of Iowa Carver College of Medicine, Department of Surgery, Iowa City, IA, 52242

²University of Iowa Carver College of Medicine, Department of Pathology, Iowa City, IA, 52242

Introduction: Neuroendocrine tumors (NETs) frequently metastasize to the liver. Surgical debulking offers symptomatic relief and improved survival. However, the frequent presence of multifocal, bilobar disease and high recurrence rates introduce doubt regarding their optimal management. Parenchyma-sparing debulking (PSD) procedures (ablation, enucleation, wedge resections) may offer similar survival improvements as resection, while minimizing morbidity and preserving functional liver tissue.

Methods: Clinicopathologic variables from 226 patients with primary and/or metastatic small bowel (SBNETs) or pancreatic neuroendocrine tumors (PNETs) who were managed surgically at one institution were collected. Liver-directed surgery (LDS) with primarily PSD procedures was carried out when 70% debulking was deemed feasible. Survival was assessed using the Kaplan-Meier method.

Results: 108 patients with PNETs or SBNETs underwent LDS, 91 (84.2%) of whom had concurrent resection of their primaries or recurrences. The median number of lesions treated by PSD was 6.0 (range 0–36). Approximately two-thirds of patients achieved 70% hepatic cytoreduction. The 30-day major complication rate was 12.9%. There were no 30-day

operative mortalities. PNET patients having LDS (n=28) had a median overall survival (OS) of 126 months (OS of PNET M1 patients in SEER, 24 months). Median OS was not reached in the 80 SBNET patients undergoing LDS (OS of SBNET M1 patients in SEER, 56 months). SBNET and PNET patients that achieved 70% hepatic cytoreduction enjoyed significantly improved progression free survival (median 3.2 years, $p < .001$) and overall survival (median not reached, $p = .009$) (Figure).

Conclusion: Hepatic resection improves survival in NET patients, but disease recurrence is nearly universal. PSD procedures are safe, reduce the loss of functional liver tissue, and can treat bilobar disease. In this series, patients with SBNET and PNET hepatic metastases undergoing PSD procedures had improved PFS and OS, with minimal morbidity and no mortality. Lowering the debulking target threshold to 70% will benefit NET patients by increasing eligibility for cytoreduction.

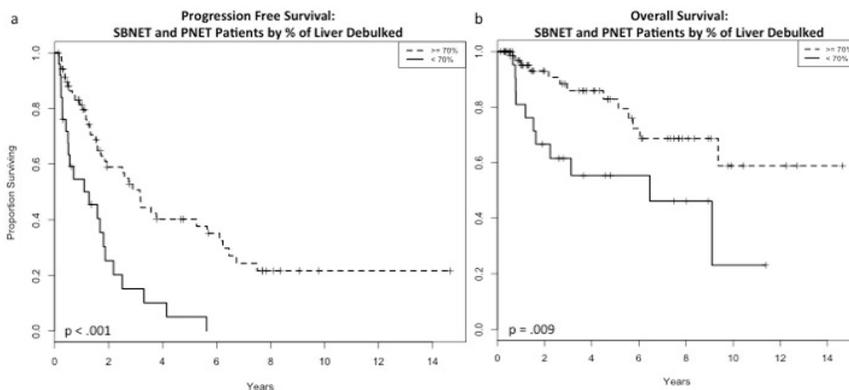


Figure. Kaplan-Meier curve of PFS (a) and OS (b) in all NET patients who were stratified by the amount of hepatic disease debulked. Patients had significant improvements of PFS and OS if at least 70% of their tumor burden could be debulked.