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Risk Factors and Prognosis of Peritoneal Metastases in Small Bowel Neuroendocrine Tumor Patients

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BACKGROUND

Small bowel neuroendocrine tumors (SBNETs) demonstrate indolent growth despite 25-50% of patients presenting with metastases at diagnosis. Surgical resection and cytoreduction may improve survival even with metastatic disease. The peritoneum is the second most common metastatic site after the liver, and while studies suggest that peritoneal metastases (PM) are associated with worse overall survival (OS), limited data exist on risk factors and outcomes of these patients post resection.

METHODS

A single-institution review of a prospective database identified patients from 2005-2024 with histopathologic diagnosis of SBNET who underwent surgical intervention (primary resection and/or metastasis cytoreduction). Demographics, disease characteristics, treatments, and outcomes were abstracted. The Lyon staging system defined the extent of PM when available. Primary outcome measures were OS and progression-free survival (PFS), estimated by Kaplan Meier Method and compared by Log Rank Test. Cox multivariable analysis was performed to identify variables independently associated with PM.

RESULTS

396 patients were included in the study with rates of metastatic disease and PM of 71.7% and 30.1%, respectively. 21 (5.3%) of patients developed PM after their initial surgery at a median time of 54 months. Presence of liver metastases, female sex, higher T stage and elevated pancreastatin levels were associated with increased risk of PM. By Kaplan-Meier analysis, patients with PM had worse OS (109 vs. 169 months, $p=0.01$) and PFS (42 vs. 75 months, $p<0.01$) than those without PM. On multivariable analysis, these factors were not independently significant. Patients who received cytoreduction of PM had higher rates of major complications (i.e. Clavien Dindo 3 or 4) than those who did not (11.2% vs 2.0%, $p<0.01$) and had higher rates of postoperative bowel obstruction (at any time point after initial surgery; 22.7% vs 3.6%, $p<0.01$). A contributing factor may be the increased use of peptide receptor radionuclide therapy (PRRT) in this population (36.1% PM vs 19.9% no PM, $p<0.01$), as the rate of bowel obstruction in PM patients who received PRRT was 44.2%.

CONCLUSIONS

Peritoneal metastases occur in 30% of patients with SBNETs and are more common in patients with liver metastases and higher T stage. Despite PM, patients can still have good long-term survival

after cytoreduction. Although there is an increase in complication rate, these findings validate that aggressive surgical management of SBNET patients with PM are warranted when feasible.

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