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Surgical Interventions in Patients with Pancreatic Neuroendocrine Tumors: a SEER-based Survival Analysis

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BACKGROUND: The role of surgery in the management of pancreatic neuroendocrine tumors (PanNET) remains hotly debated. Previous analyses of registry databases compare patients who had surgery to those who did not, but these results have been affected by selection bias. Comparing outcomes in patients who underwent surgery to those who were offered surgery but refused could reduce that bias.

METHODS: The Surveillance, Epidemiology, and End Results (SEER) database was queried for patients diagnosed with PanNET between 1998-2017. Kaplan-Meier curves were constructed to compare survival for patients who were offered surgery and those who were not, as well as patients who underwent surgery to those who refused, by disease stage. Log-rank test was used to examine significance

RESULTS: Patients who were offered surgery for PanNET (N=2256) were associated with higher 10-year survival compared to patients who were not (N=1956, p<0.001). Surgery offer was associated with increased survival for patients at all disease stages: T stage <3 (p<0.001) and T3-T4 (p<0.001), N0 stage (p<0.001) and N1 stage (p<0.001), M0 stage (p<0.001) and M1 stage (p<0.001), low-grade (p<0.001) and high-grade tumors (p<0.001). Patients who had surgery performed (N=1933) had improved 10-year survival compared to those who were offered but refused surgery (N=48) (p=0.001). Sub-analysis comparing patients who had surgery performed to those who refused it was limited by low sample size, but performing surgery was associated with improved survival for patients with T stage <3 (p=0.013), T3-T4 (p<0.001), and M1 stage (p=0.032).

CONCLUSION: Survival analysis suggests improved survival in patients who were offered surgery for PanNET compared to those who were not. Comparing patients who underwent surgery to those who refused it continues to suggest a survival benefit though the existing data are limited. Decreasing selection bias in NET outcomes research can clarify the role of surgery in PanNET management.

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