

TOTAL PANCREATECTOMY FOR PANCREATIC DUCTAL ADENOCARCINOMA: REVIEW OF THE NATIONAL CANCER DATA BASE

Cory Johnston MD, Helena Hoen MS, Maria A. Cassera BS, Pippa Newell MD, Ronald F. Wolf MD, Paul D. Hansen MD, Chet Hammill MD

Department of Hepatobiliary and Pancreatic Surgery, Providence Cancer Center, Portland, Oregon

INTRODUCTION

Total pancreatectomy is infrequently performed in the management of pancreatic cancer. High operative mortality and questionable survival benefit deter many surgeons from considering this option. Clinical outcomes have only been described in single-center series, and remain largely unknown.

METHODS

The National Cancer Data Base was queried for all cases of pancreatic ductal adenocarcinoma undergoing total pancreatectomy. Single predictor, univariate survival analyses were performed for 21 variables: 8 demographic, 5 tumor characteristics, 6 surgery outcomes, and 2 adjuvant therapy variables. The Log rank test of differences in Kaplan-Meier survival curves was used for categorical variables. Variables with $p < .05$ were included in a multivariate analysis. Cox proportional hazards regression was used to analyze continuous variables and multivariate models.

RESULTS

5,726 patients with pancreatic ductal adenocarcinoma undergoing total pancreatectomy between 1998 and 2011 were identified. 2,601 patients with both staging and survival data made up the study population. 30-day operative mortality was 6.02%. Median overall survival was 15 months, with 1, 3, and 5-year survival rates of 60%, 22%, and 13%, respectively. Nine clinical variables significantly impacted survival in a multivariate analysis. These include age, insurance status, facility type, tumor size and grade, lymph node positivity and lymph node ratio, margin positivity, and adjuvant therapy (Table 1).

CONCLUSIONS

Total pancreatectomy is a reasonable option for selected patients with pancreatic ductal adenocarcinoma. Operative mortality is acceptable. Greater survival benefits were seen in younger patients with smaller, node negative tumors resected with negative margins in academic research centers.

PARAMETER	COMPARISON VARIABLE	HAZARD RATIO	95% CONFIDENCE INTERVAL	GLOBAL P-VAL	PAIRED TEST P-VAL
AGE <i>unit=10</i>		1.07	1.01 – 1.14	0.020	0.020
INSURANCE STATUS					
Medicare vs.	Private Insurance	1.18	1.04 – 1.34	0.036	0.012
FACILITY TYPE					
Community Cancer Program vs.	Academic Research	1.09	0.89 – 1.34	0.005	0.409
Comprehensive Community Cancer vs.	Academic Research	1.16	1.05 – 1.29	--	0.003
Other Cancer Program vs.	Academic Research	1.54	1.07 – 2.22	--	0.019
TUMOR SIZE					
2-5 cm vs.	<2 cm	1.43	1.21 – 1.69	<.0001	<.0001
≥5cm vs.	<2 cm	1.74	1.44 – 2.11	--	<.0001
TUMOR GRADE					
Grade 2 vs.	Grade 1	1.56	1.31 – 1.85	<.0001	<.0001
Grade 3 vs.	Grade 1	1.87	1.57 – 2.24	--	<.0001
Grade 4 vs.	Grade 1	2.19	1.31 – 3.66	--	0.003
LYMPH NODE POSITIVITY					
≥1 Positive Nodes vs.	0 Positive Nodes	1.29	1.14 – 1.46	<.0001	<.0001
LYMPH NODE RATIO <i>unit=.2</i>		1.08	1.02 – 1.13	0.005	0.005
SURGICAL MARGINS					
Microscopic Positive (R1) vs.	Negative (R0)	1.42	1.23 – 1.63	<.0001	<.0001
Macroscopic Positive (R2) vs.	Negative (R0)	1.75	1.19 – 2.58	--	0.005
ADJUVANT THERAPY					
Chemo only vs.	Radiation + Chemo	1.17	1.01 – 1.35	<.0001	0.042
Radiation only vs.	Radiation + Chemo	1.62	1.23 – 2.15	--	0.001
Neither vs.	Radiation + Chemo	1.71	1.54 – 1.91	--	<.0001