

Supplementary Table 1. Univariate Cox Regression Analysis for OS

Clinical value	No. of patients	Median OS, mo	95% CI, mo	Univariate analysis	
				HR (95% CI)	p-value
Age					
≤70 yr (Ref)	144	30.3	23.9–36.7		
>70 yr	123	18.1	12.3–24.0	1.76 (1.34–2.32)	<0.001
Sex					
Female (Ref)	126	28.8	21.7–35.9		
Male	141	24.9	20.0–29.8	1.10 (0.83–1.44)	0.506
Serum CA19-9 at diagnosis					
<37 U/mL (Ref)	79	34.2	25.6–42.9		
≥37 U/mL	188	23.4	19.6–27.2	1.62 (1.18–2.23)	0.003
Resectability					
RPC (Ref)	232	28.6	23.9–33.2		
BRPC	35	14.9	12.2–17.6	1.60 (1.10–2.34)	0.014
Operation type					
Non-PD (Ref)	106	29.0	24.5–33.5		
PD	161	23.3	19.4–27.2	1.26 (0.95–1.67)	0.110
Surgical margins					
R0 (Ref)	202	32.2	27.4–36.9		
R1	65	15.2	12.6–17.7	2.40 (1.77–3.24)	<0.001
T stage*					
T1 (Ref)	30	-	-		
T2	168	28.6	22.6–34.5	2.60 (1.46–4.61)	0.001
T3	69	16.3	12.3–20.4	5.00 (2.74–9.13)	<0.001
N stage*					
N0 (Ref)	81	44.1	28.7–59.5		
N1	114	26.6	21.4–31.8	1.83 (1.29–2.59)	0.001
N2	72	17.8	14.0–21.7	2.73 (1.87–3.98)	<0.001
Angiolymphatic invasion					
No (Ref)	98	40.9	34.0–47.8		
Yes	169	20.8	17.7–23.9	2.03 (1.50–2.74)	<0.001
Perineural invasion					
No (Ref)	28	62.4	12.0–112.8		
Yes	239	24.9	21.1–28.7	2.03 (1.18–3.49)	0.011
Adjuvant treatment					
Yes (Ref)	185	32.3	26.7–37.9		
No	82	13.6	9.7–17.5	2.01 (1.51–2.69)	<0.001
Palliative chemotherapy after recurrence					
No recurrence (Ref)	64	-	-		
FOLFIRINOX or GNP	100	27.7	24.5–31.0	4.27 (2.60–7.00)	<0.001
Neither FOLFIRINOX nor GNP	16	17.5	9.9–25.2	6.74 (3.42–13.3)	<0.001
Supportive care only	87	15.6	11.5–19.7	8.21 (4.96–13.6)	<0.001

OS, overall survival; HR, hazard ratio; CI, confidence interval; CA19-9, carbohydrate antigen 19-9; RPC, resectable pancreatic cancer; BRPC, borderline resectable pancreatic cancer; PD, pancreaticoduodenectomy; FOLFIRINOX, combination of 5-fluorouracil, leucovorin, irinotecan, and oxaliplatin; GNP, gemcitabine plus nab-paclitaxel.

*T and N stages were assessed based on the 8th edition of American Joint Committee on Cancer staging system.

Supplementary Table 2. Univariate Cox Regression Analysis for RFS

Clinical value	No. of patients	Median RFS, mo	95% CI, mo	Univariate analysis	
				HR (95% CI)	p-value
Age					
≤70 yr (Ref)	144	13.8	10.6–17.0		
>70 yr	123	9.7	6.7–12.7	1.50 (1.15–1.95)	0.002
Sex					
Female (Ref)	126	11.7	8.4–14.9		
Male	141	12.0	9.6–14.4	1.04 (0.80–1.35)	0.787
Serum CA19-9 at diagnosis					
<37 U/mL (Ref)	79	18.8	13.9–23.7		
≥37 U/mL	188	11.0	9.2–12.8	1.54 (1.14–2.07)	0.005
Resectability					
RPC (Ref)	232	12.8	10.1–15.5		
BRPC	35	7.6	3.5–11.7	1.54 (1.06–2.23)	0.022
Operation type					
Non-PD (Ref)	106	12.0	6.5–17.5		
PD	161	11.7	9.7–13.8	1.06 (0.81–1.38)	0.700
Surgical margins					
R0 (Ref)	202	15.8	12.3–19.4		
R1	65	6.7	5.7–7.7	2.73 (2.02–3.67)	<0.001
T stage*					
T1 (Ref)	30	-	-		
T2	168	13.5	10.5–16.5	3.08 (1.77–5.34)	<0.001
T3	69	7.4	5.6–9.2	6.35 (3.52–11.4)	<0.001
N stage*					
N0 (Ref)	81	28.5	12.3–44.7		
N1	114	11.3	8.7–13.9	2.08 (1.49–2.92)	<0.001
N2	72	8.3	5.8–10.7	2.99 (2.08–4.31)	<0.001
Angiolymphatic invasion					
No (Ref)	98	24.0	14.7–33.3		
Yes	169	9.9	7.9–11.8	2.34 (1.75–3.12)	<0.001
Perineural invasion					
No (Ref)	28	31.4	-		
Yes	239	11.3	9.6–13.0	2.35 (1.39–3.97)	0.001
Adjuvant treatment					
Yes (Ref)	185	15.6	12.1–19.2		
No	82	7.0	5.1–8.9	1.84 (1.39–2.43)	<0.001

RFS, recurrence-free survival; HR, hazard ratio; CI, confidence interval; CA19-9, carbohydrate antigen 19-9; RPC, resectable pancreatic cancer; BRPC, borderline resectable pancreatic cancer; PD, pancreaticoduodenectomy.

*T and N stage were assessed based on the 8th edition of American Joint Committee on Cancer staging system.

Supplementary Table 3. Multivariate Cox Regression Analysis for Recurrence-Free Survival

Clinical values	No. of patients	Multivariate analysis		Survival prediction score [†]	
		HR (95% CI)	p-value	β coefficient	Score [‡]
Age					
≤70 yr (Ref)	144				
>70 yr	123	1.24 (0.93–1.64)	0.142		
Serum CA19-9 at diagnosis					
<37 U/mL (Ref)	79				
≥37 U/mL	188	1.19 (0.87–1.63)	0.267		
Resectability					
RPC (Ref)	232				
BRPC	35	1.20 (0.82–1.77)	0.353		
Surgical margins					
R0 (Ref)	202				0
R1	65	1.80 (1.31–2.49)	<0.001	0.608	1
T stage*					
T1 (Ref)	30				0
T2	168	1.67 (0.93–2.99)	0.084	0.645	1
T3	69	2.86 (1.52–5.37)	0.001	1.150	2
N stage*					
N0 (Ref)	81				0
N1	114	1.62 (1.11–2.36)	0.011	0.530	1
N2	72	2.14 (1.39–3.30)	0.001	0.790	2
Angiolymphatic invasion					
No (Ref)	98				0
Yes	169	1.59 (1.15–2.21)	0.005	0.477 [§]	1
Perineural invasion					
No (Ref)	28				
Yes	239	1.55 (0.89–2.69)	0.123		
Adjuvant treatment					
Yes (Ref)	185				0
No	82	1.96 (1.43–2.69)	<0.001	0.711	1

HR, hazard ratio; CI, confidence interval; CA19-9, carbohydrate antigen 19-9; RPC, resectable pancreatic cancer; BRPC, borderline resectable pancreatic cancer.

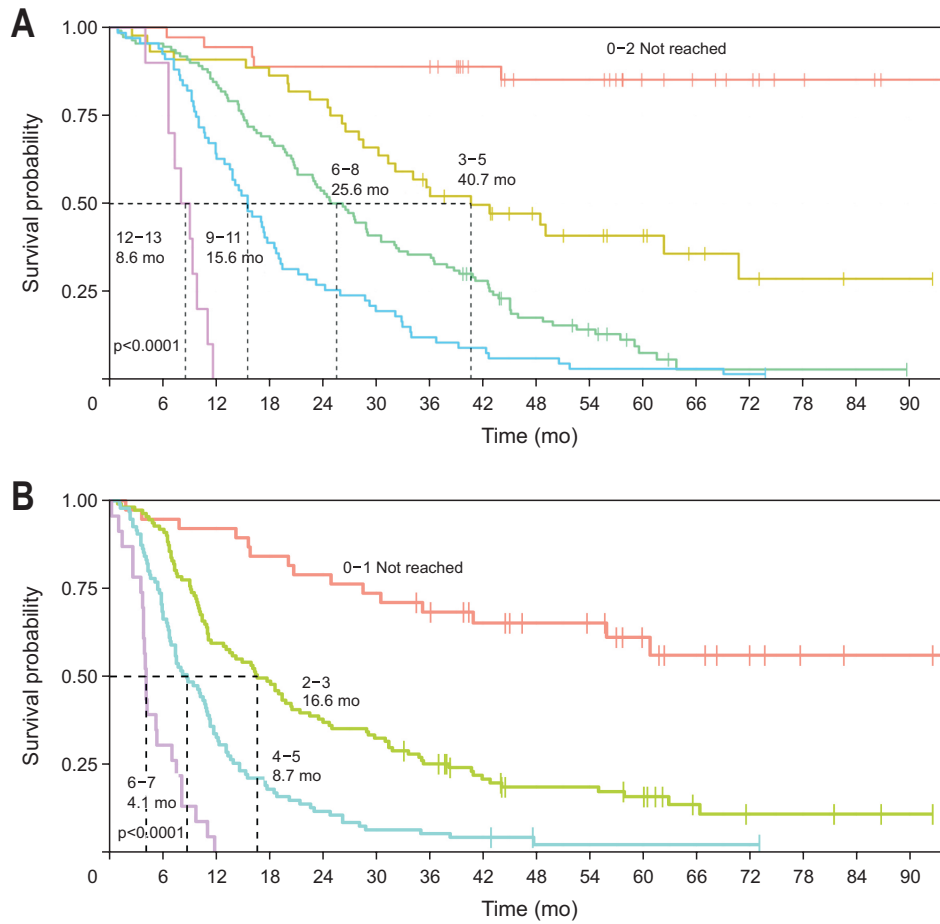
*T and N stage were assessed based on the 8th edition of American Joint Committee on Cancer staging system; [†]Harrell's c-index by bootstrap validation (resampling, n=1,500)=0.709; [‡]The weighted scores were calculated by dividing each β coefficient by the smallest [§]β coefficient (0.477) and rounding to the nearest integer.

Supplementary Table 4. Changes in the Score of the Survival Prediction Score for Recurrence-Free Survival between Two Periods

Survival prediction score	2013–2015 (n=119)	2016–2018 (n=148)	Total (n=267)	p-value
Surgical margins	0.30±0.46	0.20±0.40	0.24±0.43	0.044
T stage*	1.24±0.60	1.07±0.58	1.15±0.59	0.015
N stage*	1.01±0.80	0.93±0.73	0.97±0.76	0.431
Angiolymphatic invasion	0.62±0.49	0.64±0.48	0.63±0.48	0.737
Adjuvant treatment	0.37±0.48	0.26±0.44	0.31±0.46	0.047
Total score	3.55±1.74	3.09±1.58	3.30±1.67	0.028

Data are presented as mean±SD.

*T and N stage were assessed based on the 8th edition of American Joint Committee on Cancer staging system.



Supplementary Fig. 1. Survival analysis of patients with pancreatic cancer who underwent upfront surgery in terms of the subgroup according to the total survival prediction score. Kaplan-Meier survival curves for single-center data. (A) Overall survival and (B) recurrence-free survival by subgroup according to the total survival prediction score. For both log-rank tests, p-values were < 0.001 .