

Supplementary Table S1: Correlation of CAML detection at follow-up with clinicopathological parameters in curative patients

		CAML				
		none detected at follow-up n=12		≥ 1 CAML detected during follow-up n=10		p-value
		n	%	n	%	
Age	≤ 67 years	5	41.7	7	70.0	0.231
	> 67 years	7	58.3	3	30.0	
Gender	male	3	25.0	6	60.0	0.192
	female	9	75.0	4	40.0	
ECOG	0	4	33.3	9	90.0	0.026
	1	7	58.3	1	10.0	
	2	1	8.3	0	0.0	
Neoadjuvant treatment	no	9	75.0	6	60.0	0.652
	yes	3	25.0	4	40.0	
Surgical procedure	PD/PPPD	8	66.7	7	70.0	0.896
	left pancreatectomy	2	16.7	2	20.0	
	total pancreatectomy	2	16.7	1	10.0	
Adjuvant treatment	yes	2	16.7	0	0.0	0.481
	no	10	83.3	10	100.0	
Dindo classification	0-2	8	66.7	4	40.0	0.391
	3-4	4	33.3	6	60.0	
pT stage	T1-2	6	50.0	5	50.0	1.000
	T3-4	6	50.0	5	50.0	
pN stage	N0	5	41.7	1	10.0	0.162
	N+ (N1/2)	7	58.3	9	90.0	
Grading ¹	G2	7	63.4	7	77.8	0.642
	G3	4	36.6	2	22.2	
R status	R0, CRM-	9	75.0	7	70.0	1.000
	R0, CRM+ / R1	3	25.0	3	30.0	

¹ For n=2 patients no grading (G) is available

UICC	I-II	9	75.0	4	40.0	0.192
	III	3	25.0	6	60.0	
Ca 19-9	≤ 500U/ml	9	75.0	8	80.0	1.000
	> 500U/ml	3	25.0	2	20.0	
Recurrence	no	6	50.0	1	10.0	0.074
	yes	6	50.0	9	90.0	
CTC detection at follow-up	no	8	66.7	5	50.0	0.666
	yes	4	33.3	5	50.0	

ECOG, Eastern Cooperative Oncology Group; CRM, circumferential resection margin; Ca 19-9, Carbohydrate Antigen 19-9; UICC, Union for International Cancer Control; PD, partial pancreatoduodenectomy; PPPD, pylorus preserving pancreatoduodenectomy

Supplementary Table S2: Patient characteristic and overall survival curative and palliative cohort including CAML detection

A) OS curative					B) OS palliative				
		n=33 [§]	Median OS, months (95% CI)	p-value			n=19	Median OS, month (95% CI)	p-value
Age	≤ 67 years	17	21.4 (18.9-20.0)*	0.603	Age	≤67 years	9	17.0 (7.7-26.3)	0.023
	> 67 years	16	21.2 (15.9-24.4)*			>67 years	10	3.0 (0.9-5.1)	
Gender	male	16	18.4 (14.1-22.7)*	0.030	Gender	male	14	10.0 (4.6-1.1)	0.709
	female	17	23.1 (21.4-24.8)*			female	5	11.8 (3.6-19.9)*	
ECOG	0	20	13.4 (8.0-21.8)*	0.664	ECOG	0	5	17.0 (0-35.9)	0.571
	1	12	7.8 (2.3-14.1)*			1	11	10.0 (0-20.6)	
	2	33	9.0 (8.0-10.0)*			2	3	5.0 (0-11.4)	
UICC stage	I-II	26	22.0 (19.2-24.8)*	0.125	UICC stage	III	3	17.0 (0-36.2)	0.745
	III	7	14.8 (12.5-17.0)*			IV	16	10.0 (0.9-19.1)	
Ca 19-9	<500 U/ml	24	21.2 (18.2-24.2)*	0.991	CAMLs detected at FUP #	no	5	5.0 (0-19.7)	0.220
	≥500 U/ml	9	17.9 (14.9-20.8)*			yes	6	18.8 (14.9-22.6)*	
R-status	R0; CRM-	17	18.2 (15.6-20.8)*	0.813					
	CRM+ /R1	16	21.5 (17.9-25.1)*						
Grading ~	G2	21	20.0 (16.4-23.5)*	0.396					
	G3	9	19.8 (17.6-21.9)*						
Neoadjuvant treatment	no	26	20.7 (17.7-23.8)*	0.484					
	yes	7	18.5 (17.6-19.4)*						
Adjuvant treatment	no	4	6.8 (0.7-12.8)*	<0.001					
	yes	29	23 (21.2-24.8)*						
Clavien-Dindo	0-2	19	24.0 (22.1-25.9)*	0.054					
	3-4	14	17.4 (15.3-19.6)*						
CAMLs detected at FUP #	no	12	19.6 (6.4-22.8)*	0.031					
	yes	10	7.0 (2.3-10.1)						

A+B) Univariate analyses (p-values, log-rank test).

* median not reached; mean was used; # FUP number of patients [§] n=3 perioperatively deceased patients not included in the analyses;

~ grading not available for n=3 patients

OS, overall survival; CI, confidence interval; ECOG, Eastern Cooperative Oncology Group; UICC, Union for International Cancer Control; CRM, circumferential resection margin; Ca 19-9, Carbohydrate Antigen 19-9.

Supplementary Table S3. Ca19-9 values and CAML status in the FUP samples of the curative cohort.

Patient	Pre-OP Ca19-9 U/ml	3 month FUP		6 month FUP		9 month FUP		12 +15 month FUP		FUP CAML pos/neg	INCREASE Ca19-9 at time of CAML positivity	relapse	RFS (months)
UKE001	13	8	NEG	18	NEG			21	NEG	NEG	both neg	no	25
UKE021	4	5	NEG			6	NEG			NEG	both neg	no	24
UKE023	212					58	NEG			NEG	n.e.	no	21
UKE058	49			43	NEG			38	NEG	NEG	both neg	no	15
UKE037	1413	38	POS							POS	CAML pos.	no	18
UKE077	7209	16710	NEG	79	NEG					NEG	both neg	no	16
UKE092	37	19	NEG	n.a.	NEG					NEG	both neg	no	13
UKE020	2			1	NEG	1	POS			POS	only CAML pos.	yes	9
UKE027	138	9	NEG	11	NEG					NEG	both neg	yes	12
UKE032	73	10	POS	26	POS					POS	CAML pos before Ca19-9	yes	12
UKE076	3562			115	NEG	13000	NEG			NEG	only Ca19-9 pos.	yes	9
UKE008	43	53	NEG	4593	NEG	165	NEG	n.a.	POS	POS	Ca19-9 before CAML	yes	6
UKE028	19	16	NEG	736	POS	12	POS			POS	both pos at same time	yes	5
UKE036	125	84	POS	95	POS					POS	only CAML pos.	yes	12
UKE040	92	264	POS	2010	POS					POS	both pos at same time	yes	10
UKE049	n.a.			1	NEG	1	NEG			NEG	both neg	yes	15
UKE072	1380					377	POS			POS	n.e.	yes	9
UKE016	37			37	NEG	6	NEG			NEG	both neg	yes	9
UKE031	1474			30	NEG	1334	NEG			NEG	only Ca19-9 pos.	yes	12
UKE056	47	76	POS	180	NEG	570	NEG			POS	both pos at same time	yes	6
UKE066	59	647	POS	66	POS					POS	both pos at same time	yes	3
UKE073	43	20	NEG	24	NEG					NEG	both neg	yes	12
											n.a. : not evaluable		