

Supplementary Table S1. Detailed clinical, laboratory, pathologic and follow-up characteristics of the 68 patients submitted to Bilemut assay.

Patient ID	Gender	Age (years)	Serum CA 19-9 (U/ml)	Serum CEA (U/ml)	Location of stricture	Malignant* pathology of ERCP-bile duct brushing or biopsy/ EUS-FNA bile duct mass or pancreatic mass or percutaneous biopsy	Initial diagnosis after first ERCP/EUS-FNA	Final diagnosis	Method of follow-up diagnosis	Diagnostic tests done to reach final diagnosis	Days of follow-up to reach final diagnosis	Status, Months of Follow-up
#1	Male	71	1692	91	Distal	Positive/Positive	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		3	Deceased, 18
#2	Male	68	2	3	Distal	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		4	Alive, 42
#3	Female	77	11	2	Distal	NS/Positive	Malignant	Cholangiocarcinoma	Bile duct mass EUS-FNA		0	Alive, 40
#4	Male	61	827	14	Intrahepatic	NS/Positive	Malignant	Cholangiocarcinoma	Bile duct mass EUS-FNA		4	Deceased, 6
#5	Male	70	41	2	Distal	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		2	Alive, 36
#6	Female	72	27	4	Distal	Positive/Positive	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		3	Deceased, 13
#7	Female	67	100	1	Distal	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		7	Deceased, 11
#8	Male	56	390	2	Distal	NS/Positive	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		1	Alive, 18
#9	Male	78	4	0	Distal	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		1	Alive, 10
#10	Male	73	373	2	Perihilar	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		0	Alive, 7
#11	Female	50	1061	1	Distal	Positive/Positive	Malignant	Pancreatic Ductal Adenocarcinoma	Pancreatic mass EUS-FNA		5	Alive, 18
#12	Female	59	2	4	Distal	NS/Positive	Malignant	Pancreatic Ductal Adenocarcinoma	Pancreatic mass EUS-FNA		5	Alive, 17
#13	Male	63	419	5	Distal	NS/Positive	Malignant	Pancreatic Ductal Adenocarcinoma	Pancreatic mass EUS-FNA		1	Deceased, 6
#14	Female	57	318	5	Distal	NS/Positive	Malignant	Pancreatic Ductal Adenocarcinoma	Pancreatic mass EUS-FNA		1	Deceased, 32
#15	Male	78	368	9	Distal	NS/Positive	Malignant	Pancreatic Ductal Adenocarcinoma	Pancreatic mass EUS-FNA		1	Deceased, 4
#16	Male	43	575	2	Distal	NS/Positive	Malignant	Pancreatic Ductal Adenocarcinoma	Pancreatic mass EUS-FNA		10	Deceased, 9
#17	Male	66	88	N/A	Distal	Negative/Positive	Malignant	Pancreatic Ductal Adenocarcinoma	Pancreatic mass EUS-FNA		0	Deceased, 16
#18	Male	62	6	2	Distal	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		4	Deceased, 10
#19	Male	56	1478	35	Perihilar	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		5	Deceased, 15
#20	Female	85	12000	176	Perihilar	Positive/Positive	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		4	Deceased, 2
#21	Male	84	12000	3	Distal	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		2	Deceased, 16
#22	Male	84	66	2	Distal	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		6	Lost, 1
#23	Male	81	88	3	Perihilar	NS/Positive	Malignant	Cholangiocarcinoma	Bile duct mass EUS-FNA		3	Deceased, 1
#24	Female	91	12000	24	Perihilar	NS/NS	Malignant	Cholangiocarcinoma	Clinicoradiographic impression		1	Deceased, <1
#25	Male	57	2	27	Perihilar	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		3	Deceased, <1
#26	Female	88	18015	13	Perihilar	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		2	Deceased, 1
#27	Female	77	11	2	Distal	NS/Positive	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		7	Deceased, <1
#28	Male	83	12000	4	Intrahepatic	NS/Positive	Malignant	Cholangiocarcinoma	Bile duct mass percutaneous biopsy		3	Deceased, 3
#29	Female	78	1347	3	Distal	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		6	Deceased, 12
#30	Male	60	243590	288	Perihilar	NS/Positive	Malignant	Cholangiocarcinoma	Bile duct mass percutaneous biopsy		0	Deceased, 1
#31	Female	82	112	8	Perihilar	Positive/NS	Malignant	Cholangiocarcinoma	ERCP bile duct pathology brushing or biopsy		2	Deceased, 1
#32	Male	74	1433	6	Distal	NS/Positive	Malignant	Pancreatic Ductal Adenocarcinoma	Pancreatic mass EUS-FNA		4	Alive, 33
#33	Male	66	12000	2	Distal	Positive/NS	Malignant	Pancreatic Ductal Adenocarcinoma	ERCP bile duct pathology brushing or biopsy		4	Alive, 4
#34	Male	57	12000	1	Perihilar	Negative/NS	Benign	Benign bile duct stricture	Resection		45	Deceased, 31
#35	Male	91	194	N/A	Distal	Negative/NS	Benign	Benign bile duct stricture	Clinicoradiographic impression		365	Alive, 31
#36	Female	74	N/A	N/A	Distal	Negative/NS	Benign	Benign bile duct stricture	Clinicoradiographic impression	2 ERCP	365	Alive, 28
#37	Male	59	35	5	Distal	Negative/NS	Benign	Benign bile duct stricture	Clinicoradiographic impression	2 CT	365	Alive, 38
#38	Male	66	61	N/A	Distal	Negative/Negative	Benign	Benign bile duct stricture	Clinicoradiographic impression	5 ERCP, 1 US and 1 CT	365	Alive, 37
#39	Male	80	231	2	Distal	Negative/NS	Benign	Benign bile duct stricture	Clinicoradiographic impression	1 ERCP	365	Alive, 25
#40	Male	66	684	N/A	Distal	Negative/NS	Benign	Benign bile duct stricture	Clinicoradiographic impression	1 EUS, ERCP and 2 CT	366	Alive, 20
#41	Female	66	10	N/A	Distal	Negative/NS	Benign	Benign bile duct stricture	Resection		27	Alive, 8
#42	Male	49	N/A	N/A	Distal	Negative/NS	Benign	Benign bile duct stricture	Clinicoradiographic impression	2 ERCP and 1 MR	365	Alive, 34
#43	Male	74	6	4	Distal	Negative/NS	Benign	Benign bile duct stricture	Clinicoradiographic impression	2 ERCP and 1 EUS	365	Alive, 25
#44	Female	87	15	8	Distal	Negative/NS	Benign	Benign bile duct stricture	Clinicoradiographic impression	2 ERCP	366	Alive, 19
#45	Female	68	26	1	Distal	Negative/Negative	Benign	Benign bile duct stricture	Clinicoradiographic impression	4 ERCP, 2 EUS, 4 CT and 2 MR	365	Alive, 31
#46	Female	56	617	9	Distal	NS/Negative	Benign	Pancreatic Ductal Adenocarcinoma	Subsequent pancreatic mass EUS-FNA	1 EUS-FNA, 1 CT and 1 MR	207	Deceased, 10
#47	Male	77	141	3	Distal	Negative/NS	Benign	Pancreatic Ductal Adenocarcinoma	Resection		12	Alive, 22
#48	Female	68	251	2	Distal	Negative/NS	Benign	Pancreatic Ductal Adenocarcinoma	Resection		23	Alive, 4
#49	Male	80	125	2	Perihilar	Negative/NS	Benign	Gallbladder cancer	Resection		16	Alive, 3
#50	Female	81	2	12	Distal	Negative/NS	Benign	Cholangiocarcinoma	Resection	1 ERCP and EUS	34	Deceased, 20
#51	Female	61	550	6	Distal	Negative/NS	Benign	Cholangiocarcinoma	Resection	1 ERCP	37	Alive, 42
#52	Male	48	483	7	Distal	Negative/NS	Benign	Cholangiocarcinoma	Resection		28	Deceased, 32
#53	Male	66	39	5	Perihilar	Negative/NS	Benign	Cholangiocarcinoma	Resection		83	Deceased, 36
#54	Female	81	35	2	Distal	Negative/NS	Benign	Cholangiocarcinoma	Resection		36	Deceased, 38
#55	Male	73	97	3	Distal	Negative/NS	Benign	Cholangiocarcinoma	Resection		28	Alive, 15
#56	Male	77	4650	1	Distal	Negative/NS	Benign	Cholangiocarcinoma	Resection	2 ERCP	57	Alive, 4
#57	Female	72	365	1	Distal	Negative/NS	Benign	Cholangiocarcinoma	Subsequent bile duct mass percutaneous biopsy	1 US and Percutaneous biopsy	10	Deceased, 5
#58	Female	84	878	6	Perihilar	Negative/NS	Benign	Cholangiocarcinoma	Clinicoradiographic impression		260	Deceased, 16
#59	Male	87	2	8	Perihilar	Negative/NS	Benign	Cholangiocarcinoma	Clinicoradiographic impression		50	Deceased, 1
#60	Female	87	2	N/A	Distal	NS/NS	Indeterminate	Benign bile duct stricture	Clinicoradiographic impression		366	Alive, 21
#61	Male	75	12000	3	Perihilar	Negative/NS	Indeterminate	Cholangiocarcinoma	Subsequent bile duct mass Percutaneous biopsy	1 US and Percutaneous biopsy	18	Deceased, 10
#62	Male	86	3079	2	Distal	NS/NS	Indeterminate	Cholangiocarcinoma	Clinicoradiographic impression		148	Deceased, 5
#63	Female	70	952819	6833	Intrahepatic	Negative/NS	Indeterminate	Cholangiocarcinoma	Clinicoradiographic impression		45	Deceased, 1
#64	Female	81	290	2	Distal	Negative/NS	Indeterminate	Cholangiocarcinoma	Clinicoradiographic impression		64	Deceased, 2
#65	Male	76	16	4	Perihilar	Negative/NS	Indeterminate	Cholangiocarcinoma	Subsequent US-paraentesis	1 US and paraentesis	49	Deceased, 2
#66	Female	65	124	1	Perihilar	Negative/NS	Indeterminate	Cholangiocarcinoma	Resection		38	Deceased, 16
#67	Male	75	250	3	Distal	NS/NS	Indeterminate	Cholangiocarcinoma	Resection		32	Alive, 8
#68	Male	58	335	3	Distal	Negative/Negative	Indeterminate	Pancreatic Ductal Adenocarcinoma	Resection		35	Deceased, 13

*Malignant biliary duct pathology was defined as at least high-grade dysplasia or at least suspicious for malignancy.

Abbreviations: N/A, not available; NS, not submitted; ERCP, Endoscopic Retrograde Cholangiopancreatography; FNA, Fine-needle aspiration; EUS, Endoscopic Ultrasound; CT, Computed Tomography; US: Abdominal Ultrasound; MR: Magnetic Resonance