

## Supplementary Tables

***Supplementary table 1a – Other predictors of anastomotic leak - patient demographics and comorbidities***

	N	Anastomotic Leak		p-Value
		No	Yes	
Age at Surgery	411	64.7 ± 9.8	65.4 ± 8.2	0.546
Gender	411			<b>0.047</b>
<i>Female</i>		67 (77.0%)	20 (23.0%)	
<i>Male</i>		279 (86.1%)	45 (13.9%)	
BMI	400	26.8 ± 5.0	26.8 ± 4.5	0.995
ASA	396			0.979*
1		66 (84.6%)	12 (15.4%)	
2		184 (83.3%)	37 (16.7%)	
3		76 (85.4%)	13 (14.6%)	
4		6 (75.0%)	2 (25.0%)	
ECOG Status	324			0.118*
0		127 (87.0%)	19 (13.0%)	
1		119 (83.8%)	23 (16.2%)	
2		27 (75.0%)	9 (25.0%)	
Ischemic Heart Disease	410			0.417
<i>No</i>		304 (84.7%)	55 (15.3%)	
<i>Yes</i>		41 (80.4%)	10 (19.6%)	
Renal Impairment	410			0.500
<i>No</i>		342 (84.2%)	64 (15.8%)	
<i>Yes</i>		3 (75.0%)	1 (25.0%)	
Diabetes	410			0.673
<i>No</i>		304 (83.7%)	59 (16.3%)	
<i>Yes</i>		41 (87.2%)	6 (12.8%)	
COPD	410			0.608
<i>No</i>		320 (84.4%)	59 (15.6%)	
<i>Yes</i>		25 (80.6%)	6 (19.4%)	
Previous Cancer	410			1.000
<i>No</i>		329 (84.1%)	62 (15.9%)	
<i>Yes</i>		16 (84.2%)	3 (15.8%)	

Significant Smoking History	410			0.702
<i>No</i>		297 (84.4%)	55 (15.6%)	
<i>Yes</i>		48 (82.8%)	10 (17.2%)	
Alcohol Misuse/ Heavy Drinker	410			1.000
<i>No</i>		338 (84.1%)	64 (15.9%)	
<i>Yes</i>		7 (87.5%)	1 (12.5%)	

*Data are reported as N (%), with p-values from Fisher's exact tests; mean±SD, with p-values from t-tests; or as median (IQR), with p-values from Mann-Whitney tests, unless stated otherwise. Bold p-values are significant at p<0.05. \*p-Value from a Mann-Whitney test, as the factor was ordinal.*

**Supplementary Table 1b – Other predictors of anastomotic leak - disease and treatment-related factors**

	N	Anastomotic Leak		p-Value
		<i>No</i>	<i>Yes</i>	
Neoadjuvant Chemotherapy	411			1.000
<i>No</i>		57 (83.8%)	11 (16.2%)	
<i>Yes</i>		289 (84.3%)	54 (15.7%)	
Mandard Score**	317			0.858*
<i>Mandard 1 (Complete)</i>		18 (90.0%)	2 (10.0%)	
<i>Mandard 2</i>		20 (76.9%)	6 (23.1%)	
<i>Mandard 3</i>		61 (88.4%)	8 (11.6%)	
<i>Mandard 4</i>		95 (82.6%)	20 (17.4%)	
<i>Mandard 5 (None)</i>		74 (85.1%)	13 (14.9%)	
Operation Stages	411			0.330
<i>Two-Stage</i>		316 (83.6%)	62 (16.4%)	
<i>Three-Stage</i>		30 (90.9%)	3 (9.1%)	
Operation Type	411			0.223
<i>Hybrid</i>		181 (81.5%)	41 (18.5%)	
<i>MIO</i>		88 (85.4%)	15 (14.6%)	
<i>Open</i>		77 (89.5%)	9 (10.5%)	
Tumour Type	407			0.915
<i>Adenocarcinoma</i>		268 (83.8%)	52 (16.3%)	
<i>Adenosquamous</i>		7 (87.5%)	1 (12.5%)	
<i>Squamous</i>		54 (83.1%)	11 (16.9%)	
<i>Other</i>		13 (92.9%)	1 (7.1%)	
T-Stage	408			0.864*

<i>T0</i>		16 (94.1%)	1 (5.9%)	
<i>T1</i>		32 (74.4%)	11 (25.6%)	
<i>T2</i>		44 (86.3%)	7 (13.7%)	
<i>T3</i>		231 (84.9%)	41 (15.1%)	
<i>T4</i>		20 (80.0%)	5 (20.0%)	
N-Stage	410			0.445*
<i>N0</i>		131 (86.2%)	21 (13.8%)	
<i>N1</i>		142 (83.0%)	29 (17.0%)	
<i>N2</i>		44 (81.5%)	10 (18.5%)	
<i>N3</i>		28 (84.8%)	5 (15.2%)	
M-Stage	403			0.639
<i>M0</i>		332 (84.3%)	62 (15.7%)	
<i>M1</i>		7 (77.8%)	2 (22.2%)	
R-Status	405			0.899*
<i>R0</i>		214 (84.3%)	40 (15.7%)	
<i>R1</i>		116 (82.9%)	24 (17.1%)	
<i>R2</i>		10 (90.9%)	1 (9.1%)	
Peri-Neural Invasion	313			0.871
<i>No</i>		173 (84.0%)	33 (16.0%)	
<i>Yes</i>		91 (85.0%)	16 (15.0%)	
Lymph Nodes Total	410	30.8 ± 10.9	28.4 ± 9.8	0.099
Lymph Nodes Involved	410	1 (0 - 4)	2 (0 - 4)	0.353
Percentage of Resected Nodes Involved	410	5 (0 - 13)	6 (0 - 18)	0.237

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***Supplementary table 2a – Other predictors of conduit necrosis - patient demographics and comorbidities***

	Conduit Necrosis	
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	<i>No</i>	<i>Yes</i>	<i>p-Value</i>
Age at Surgery	64.8 ± 9.4	65.6 ± 11.8	0.756
Gender			<b>0.014</b>
<i>Female</i>	80 (92.0%)	7 (8.0%)	
<i>Male</i>	317 (97.8%)	7 (2.2%)	
BMI	26.8 ± 4.9	26.0 ± 5.3	0.552
ASA			<b>0.024*</b>
<i>1</i>	77 (98.7%)	1 (1.3%)	
<i>2</i>	215 (97.3%)	6 (2.7%)	
<i>3</i>	83 (93.3%)	6 (6.7%)	
<i>4</i>	7 (87.5%)	1 (12.5%)	
ECOG Status			0.112*
<i>0</i>	143 (97.9%)	3 (2.1%)	
<i>1</i>	137 (96.5%)	5 (3.5%)	
<i>2</i>	33 (91.7%)	3 (8.3%)	
Ischemic Heart Disease			0.397
<i>No</i>	348 (96.9%)	11 (3.1%)	
<i>Yes</i>	48 (94.1%)	3 (5.9%)	
Renal Impairment			0.130
<i>No</i>	393 (96.8%)	13 (3.2%)	
<i>Yes</i>	3 (75.0%)	1 (25.0%)	
Diabetes			<b>0.014</b>
<i>No</i>	354 (97.5%)	9 (2.5%)	
<i>Yes</i>	42 (89.4%)	5 (10.6%)	
COPD			0.081
<i>No</i>	368 (97.1%)	11 (2.9%)	
<i>Yes</i>	28 (90.3%)	3 (9.7%)	
Previous Cancer			0.491
<i>No</i>	378 (96.7%)	13 (3.3%)	
<i>Yes</i>	18 (94.7%)	1 (5.3%)	
Significant Smoking History			<b>0.008</b>
<i>No</i>	344 (97.7%)	8 (2.3%)	
<i>Yes</i>	52 (89.7%)	6 (10.3%)	
Alcohol Misuse/ Heavy Drinker			0.245
<i>No</i>	389 (96.8%)	13 (3.2%)	
<i>Yes</i>	7 (87.5%)	1 (12.5%)	

Data are reported as N (%), with *p*-values from Fisher's exact tests; mean±SD, with *p*-values from *t*-tests; or as median (IQR), with *p*-values from Mann-Whitney tests, unless stated otherwise. Bold *p*-values are significant at *p*<0.05. \**p*-Value from a Mann-Whitney test, as the factor was ordinal.

**Supplementary table 2b – Other predictors of conduit necrosis - disease  
and treatment-related factors**

	Conduit Necrosis		<i>p</i> -Value
	No	Yes	
Neoadjuvant Chemotherapy			0.064
No	63 (92.6%)	5 (7.4%)	
Yes	334 (97.4%)	9 (2.6%)	
Mandard Score**			0.133*
Mandard 1 (Complete)	17 (85.0%)	3 (15.0%)	
Mandard 2	25 (96.2%)	1 (3.8%)	
Mandard 3	68 (98.6%)	1 (1.4%)	
Mandard 4	113 (98.3%)	2 (1.7%)	
Mandard 5 (None)	85 (97.7%)	2 (2.3%)	
Operation Stages			0.616
Two-Stage	364 (96.3%)	14 (3.7%)	
Three-Stage	33 (100.0%)	0 (0.0%)	
Operation Type			1.000
Hybrid	214 (96.4%)	8 (3.6%)	
MIO	100 (97.1%)	3 (2.9%)	
Open	83 (96.5%)	3 (3.5%)	
Tumour Type			0.269
Adenocarcinoma	311 (97.2%)	9 (2.8%)	
Adenosquamous	8 (100.0%)	0 (0.0%)	
Squamous	60 (92.3%)	5 (7.7%)	
Other	14 (100.0%)	0 (0.0%)	
T-Stage			0.061*
T0	16 (94.1%)	1 (5.9%)	
T1	38 (88.4%)	5 (11.6%)	
T2	51 (100.0%)	0 (0.0%)	
T3	264 (97.1%)	8 (2.9%)	
T4	25 (100.0%)	0 (0.0%)	

N-Stage			0.073*
<i>N0</i>	143 (94.1%)	9 (5.9%)	
<i>N1</i>	168 (98.2%)	3 (1.8%)	
<i>N2</i>	53 (98.1%)	1 (1.9%)	
<i>N3</i>	32 (97.0%)	1 (3.0%)	
M-Stage			1.000
<i>M0</i>	380 (96.4%)	14 (3.6%)	
<i>M1</i>	9 (100.0%)	0 (0.0%)	
R-Status			0.199*
<i>R0</i>	243 (95.7%)	11 (4.3%)	
<i>R1</i>	137 (97.9%)	3 (2.1%)	
<i>R2</i>	11 (100.0%)	0 (0.0%)	
Peri-Neural Invasion			0.723
<i>No</i>	199 (96.6%)	7 (3.4%)	
<i>Yes</i>	105 (98.1%)	2 (1.9%)	
Lymph Nodes Total	30.4 ± 10.8	30.6 ± 10.8	0.944
Lymph Nodes Involved	1 (0 - 4)	0 (0 - 1)	<b>0.034</b>
Percentage of Resected Nodes Involved	5 (0 - 14)	0 (0 - 3)	<b>0.025</b>

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**Supplementary Table 3 – Inter-rater reliability of calcification scores**

Proximal (N=412)				Distal (N=380)			
Reviewer 1	Reviewer 2			Reviewer 1	Reviewer 2		
	<i>0</i>	<i>1</i>	<i>2</i>		<i>0</i>	<i>1</i>	<i>2</i>
<i>0</i>	156	4	0	<i>0</i>	50	0	0
<i>1</i>	5	191	3	<i>1</i>	1	185	7
<i>2</i>	0	0	53	<i>2</i>	0	3	134
Absolute Agreement = 97.1%, $\kappa_w = 0.968$				Absolute Agreement = 97.1%, $\kappa_w = 0.967$			
Coeliac (N=413)				Bifurcation (N=380)			
	Reviewer 2				Reviewer 2		

Reviewer 1	0	1	2	Reviewer 1	0	1	2
0	308	7	1	0	108	0	0
1	8	82	2	1	6	171	9
2	0	0	5	2	0	1	85
<i>Absolute Agreement = 95.6%, <math>\kappa_w = 0.884</math></i>				<i>Absolute Agreement = 95.8%, <math>\kappa_w = 0.960</math></i>			
R Post (N=413)				L Post (N=413)			
Reviewer 1	Reviewer 2			Reviewer 1	Reviewer 2		
	0	1	-		0	1	-
0	398	4	-	0	328	15	-
1	0	11	-	1	0	70	-
<i>Absolute Agreement = 99.0%, <math>\kappa_w = 0.841</math></i>				<i>Absolute Agreement = 96.4%, <math>\kappa_w = 0.881</math></i>			

$\kappa_w$  = Quadratic weighted kappa

*Supplementary Table 4 – Correlations between calcification scores and ECCG grades of complications*

	Anastomotic Leak Grade			Conduit Necrosis Grade		
	<i>N</i>	<i>Rho</i>	<i>p-Value</i>	<i>N</i>	<i>Rho</i>	<i>p-Value</i>
Proximal	65	-0.023	0.853	14	-0.109	0.710
Coeliac	65	0.003	0.981	14	-0.111	0.705
R Post	65	-0.099	0.433	14	<i>NC</i>	<i>NC</i>
L Post	65	0.132	0.294	14	-0.155	0.597
Distal	59	0.071	0.595	14	0.276	0.339
Bifurcation	59	0.119	0.369	14	0.204	0.484

*Analyses are performed for the subset of patients where the outcome occurred, and correlate the grade of the complication with the calcification scores.*

*Rho – Spearman's correlation coefficient*

*NC – Not calculable, since all patients with leaks scored 0 for R Post*



