

## Practice patterns and long-term survival for early stage rectal cancer

Stitzenberg, et al

**Supplemental Tables 1-3. Use of neoadjuvant therapy by surgical approach and T stage over time for all rectal cancers (Table 1); pT1N0 rectal cancers (Table 2); pT2N0 rectal cancers (Table 3).** These data must be interpreted with caution as the variable used for staging throughout the manuscript, the analytic stage, does not necessarily accurately reflect initial stage for cases treated with neoadjuvant therapy. This variable relies on pathologic stage unless this information is missing in which case it is filled in with other available staging information. For patients who receive surgery first, pathologic stage accurately reflects initial staging. However, for patients who receive neoadjuvant therapy, pathologic stage will often be quite different than initial stage. As a result, for Tables 1-3, a portion of the T1N0 and T2N0 patients who received neoadjuvant therapy undoubtedly had Stage II or III rectal cancer prior to treatment, which is why they received neoadjuvant treatment. In addition, multiple competing trends were occurring over this time period, including a decreasing incidence of rectal cancer, a radical shift from adjuvant to neoadjuvant radiation for Stage II and Stage III rectal cancers, and increasing adoption of local excision for early stage rectal tumors. For these reasons, the main analysis was limited to pathological T1N0 and T2N0 cases treated with surgery first.

**Supplemental Table 1A. All rectal cancers.**

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
LE only	n	2,005	2,103	2,260	2,296	2,286	2,261	2,236	2,195	2,157	2,342	2,342	2,288	2,210	28,981
	%	14.62	16.17	17.15	17.4	17.53	17.89	17.74	17.51	17.18	18.68	19.21	19.18	19.1	17.6
LE + adjuvant	n	554	588	577	537	504	488	440	395	339	390	339	323	242	5,716
	%	4.04	4.52	4.38	4.07	3.86	3.86	3.49	3.15	2.7	3.11	2.78	2.71	2.09	3.47
Neoadjuvant + LE	n	110	106	113	99	115	142	157	171	180	192	179	191	179	1,934
	%	0.8	0.82	0.86	0.75	0.88	1.12	1.25	1.36	1.43	1.53	1.47	1.6	1.55	1.17
proctectomy only	n	4,846	4,378	4,427	4,294	4,200	3,775	3,574	3,588	3,273	2,993	2,873	2,877	2,706	47,804
	%	35.33	33.67	33.59	32.55	32.21	29.87	28.35	28.62	26.06	23.88	23.57	24.12	23.38	29.02
Proctectomy + adjuvant	n	3,793	3,425	3,244	3,300	2,877	2,261	2,087	1,827	1,572	1,379	1,232	1,076	879	28,952
	%	27.65	26.34	24.61	25.01	22.06	17.89	16.55	14.57	12.52	11	10.11	9.02	7.6	17.58
Neoadjuvant + proctectomy	n	2,409	2,402	2,558	2,667	3,059	3,713	4,113	4,361	5,037	5,240	5,225	5,175	5,356	51,315
	%	17.56	18.47	19.41	20.22	23.46	29.38	32.62	34.79	40.11	41.8	42.86	43.38	46.28	31.16
Total	n	13,717	13,002	13,179	13,193	13,041	12,640	12,607	12,537	12,558	12,536	12,190	11,930	11,572	164,702
	%	100	100	100	100	100	100	100	100	100	100	100	100	100	100

**Supplemental Table 1B. pT1N0 rectal cancers.**

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
LE only	n	534	545	572	605	573	585	578	584	618	668	667	690	1,040	8,259
	%	32.29	34.19	33.83	35.09	33.49	33.31	34.59	34.03	35.5	37.61	38.55	38.87	50.76	36.56
LE + adjuvant	n	83	109	98	98	83	107	89	92	80	105	89	76	63	1,172
	%	5.02	6.84	5.8	5.68	4.85	6.09	5.33	5.36	4.6	5.91	5.14	4.28	3.07	5.19
Neoadjuvant + LE	n	12	10	12	6	5	9	10	13	13	19	17	17	16	159
	%	0.73	0.63	0.71	0.35	0.29	0.51	0.6	0.76	0.75	1.07	0.98	0.96	0.78	0.7
proctectomy only	n	885	779	872	854	879	854	801	843	780	737	698	704	655	10,341
	%	53.51	48.87	51.57	49.54	51.37	48.63	47.94	49.13	44.8	41.5	40.35	39.66	31.97	45.78
Proctectomy + adjuvant	n	48	55	48	64	57	38	39	30	38	22	26	26	22	513
	%	2.9	3.45	2.84	3.71	3.33	2.16	2.33	1.75	2.18	1.24	1.5	1.46	1.07	2.27
Neoadjuvant + proctectomy	n	92	96	89	97	114	163	154	154	212	225	233	262	253	2,144
	%	5.56	6.02	5.26	5.63	6.66	9.28	9.22	8.97	12.18	12.67	13.47	14.76	12.35	9.49
Total	n	1,654	1,594	1,691	1,724	1,711	1,756	1,671	1,716	1,741	1,776	1,730	1,775	2,049	22,588
	%	100	100	100	100	100	100	100	100	100	100	100	100	100	100

**Supplemental Table 1C. pT2N0 rectal cancers.**

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
LE only	n	118	136	117	127	134	118	127	150	113	101	100	119	114	1,574
	%	5.24	6.34	5.57	6.11	6.66	5.91	6.41	7.76	6.17	5.7	5.65	6.42	6.44	6.17
LE + adjuvant	n	117	130	132	116	109	127	93	96	70	110	92	97	57	1,346
	%	5.2	6.06	6.29	5.58	5.41	6.37	4.69	4.97	3.82	6.21	5.19	5.23	3.22	5.28
Neoadjuvant + LE	n	15	19	17	11	22	16	31	26	27	25	26	28	33	296
	%	0.67	0.89	0.81	0.53	1.09	0.8	1.56	1.35	1.47	1.41	1.47	1.51	1.86	1.16
proctectomy only	n	1,463	1,340	1,307	1,246	1,138	1,016	932	899	814	672	690	681	595	12,793
	%	64.96	62.44	62.24	59.9	56.53	50.93	47.05	46.53	44.46	37.92	38.96	36.75	33.6	50.17
Proctectomy + adjuvant	n	229	209	204	205	207	116	117	88	85	66	46	62	34	1,668
	%	10.17	9.74	9.71	9.86	10.28	5.81	5.91	4.55	4.64	3.72	2.6	3.35	1.92	6.54
Neoadjuvant + proctectomy	n	310	312	323	375	403	602	681	673	722	798	817	866	938	7,820
	%	13.77	14.54	15.38	18.03	20.02	30.18	34.38	34.83	39.43	45.03	46.13	46.74	52.96	30.67
Total	n	2,252	2,146	2,100	2,080	2,013	1,995	1,981	1,932	1,831	1,772	1,771	1,853	1,771	25,497
	%	100	100	100	100	100	100	100	100	100	100	100	100	100	100

**Supplemental Table 2.** Adjusted hazard ratios for death when all T1/T2 patients were included versus for N0 patients only.

	N any				N0			
		HR	95%CI			HR	95% CI	
T1 (1998-2005)	LE+radiation	1.161286	0.789927	1.707227	LE+radiation	1.170602	0.713709	1.922498
	LE*	1.1725	1.093347	1.257383	LE*	1.18765	1.10426	1.277966
	proctectomy+radiation*	1.170032	1.026975	1.333016	proctectomy+radiation*	1.28016	1.05934	1.543336
	Proctectomy	1			Proctectomy	1		
T1 (2003-2005) – adjusted for CCI	LE+radiation	1.02893	0.458985	2.306602	LE+radiation	1.018533	0.34166	3.036377
	LE	1.087294	0.950938	1.243202	LE	1.10901	0.963144	1.276968
	proctectomy+radiation	0.864772	0.644125	1.161002	proctectomy+radiation	0.862147	0.554137	1.341359
	Proctectomy	1			Proctectomy	1		
T2 (1998-2005)	LE+radiation	0.925491	0.687729	1.245452	LE+radiation	0.960543	0.663958	1.383218
	LE*	1.307492	1.19341	1.432481	LE*	1.388916	1.255999	1.53024
	proctectomy+radiation	0.993483	0.931246	1.059879	proctectomy+radiation	1.002505	0.907904	1.107302
	proctectomy	1			proctectomy	1		
T2 (2003-2005) – adjusted for CCI	LE+radiation	0.989742	0.561317	1.74516	LE+radiation	1.000364	0.475698	2.103706
	LE*	1.439034	1.222598	1.693786	LE*	1.535023	1.283506	1.835828
	proctectomy+radiation	0.982916	0.854468	1.130672	proctectomy+radiation	1.058518	0.844015	1.327537
	proctectomy	1			proctectomy	1		

\*Values statistically significantly different than reference category.

LE = local excision

CCI = Charlson Comorbidity Score

**Supplemental Table 3.** Adjusted hazard ratios for death when proctectomy group is limited to abdominoperineal resection.

	proctectomy				APR			
		HR	95%CI			HR	95% CI	
T1 (1998-2005)	LE+radiation	1.170602	0.713709	1.922498	LE+radiation	1.09971	0.378484	3.195282
	LE*	1.18765	1.10426	1.277966	LE	1.144559	0.990115	1.323095
	proctectomy+radiation*	1.28016	1.05934	1.543336	APR+radiation	1.147203	0.731769	1.798482
	proctectomy	1			APR	1		
T1 (2003-2005) – adjusted for CCI	LE+radiation	1.018533	0.34166	3.036377	LE+radiation	1.20756	0.016567	88.01839
	LE	1.10901	0.963144	1.276968	LE	1.316672	0.976755	1.774882
	proctectomy+radiation	0.862147	0.554137	1.341359	APR+radiation	0.454515	0.062356	3.31296
	proctectomy	1			APR	1		
T2 (1998-2005)	LE+radiation	0.960543	0.663958	1.383218	LE+radiation	0.886168	0.510104	1.539478
	LE*	1.388916	1.255999	1.53024	LE*	1.293007	1.147692	1.456723
	proctectomy+radiation	1.002505	0.907904	1.107302	APR+radiation	0.975432	0.80286	1.185098
	proctectomy	1			APR	1		
T2 (2003-2005) – adjusted for CCI	LE+radiation	1.000364	0.475698	2.103706	LE+radiation	0.945495	0.302279	2.957408
	LE*	1.535023	1.283506	1.835828	LE*	1.448574	1.150831	1.82335
	proctectomy+radiation	1.058518	0.844015	1.327537	APR+radiation	1.189375	0.782842	1.807021
	proctectomy	1			APR	1		

\*Values statistically significantly different than reference category.

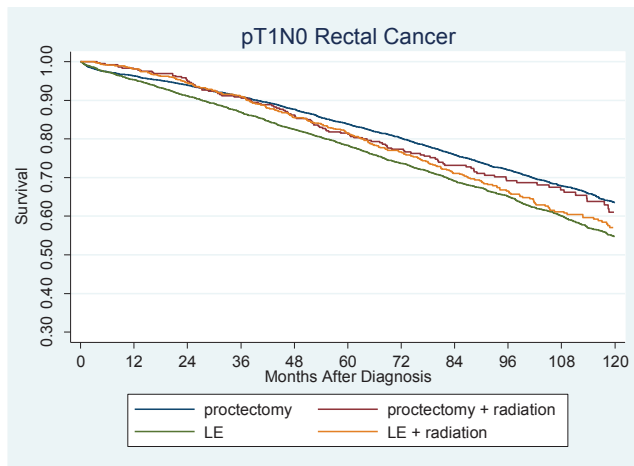
LE = local excision

CCI = Charlson Comorbidity Score

APR = abdominoperineal resection

**Supplemental Figure.** Unadjusted survival Kaplan-Meier survival curves by treatment group for A. pT1N0 rectal cancer and B. pT2N0 rectal cancer. After adjustment for other relevant demographic and clinical factors, survival differences by treatment group are less pronounced.

A



B

