

Table S1 Baseline characteristics before and after PSM

Characteristics	Before PSM			After PSM		
	IMRT	rIMRT	ASD	IMRT	rIMRT	ASD
N	1,114	487		305	305	
Year of diagnosis			0.6331			0.0196
2010–2012	474 (42.55)	74 (15.20)		38 (12.46)	40 (13.11)	
2013–2016	640 (57.45)	413 (84.80)		267 (87.54)	265 (86.89)	
Sex			0.0622			0.0376
Male	1,055 (94.70)	454 (93.22)		281 (92.13)	284 (93.11)	
Female	59 (5.30)	33 (6.78)		24 (7.87)	21 (6.89)	
Age at diagnosis (years)			0.1813			0.0652
<40	28 (2.51)	4 (0.82)		3 (0.98)	3 (0.98)	
40–49	257 (23.07)	107 (21.97)		70 (22.95)	72 (23.61)	
50–59	484 (43.45)	235 (48.25)		140 (45.90)	140 (45.90)	
60–69	269 (24.15)	116 (23.82)		78 (25.57)	73 (23.93)	
≥70	76 (6.82)	25 (5.13)		14 (4.59)	17 (5.57)	
Cancer site			0.0943			0.0329
Upper third or cervical area	168 (15.08)	64 (13.14)		36 (11.80)	37 (12.13)	
Middle third or thoracic	526 (47.22)	222 (45.59)		147 (48.20)	147 (48.20)	
Lower third or abdominal	266 (23.88)	116 (23.82)		80 (26.23)	75 (24.59)	
Origin intermediate or NOS	154 (13.82)	85 (17.45)		42 (13.77)	46 (15.08)	
Histological type			0.0112			0.0172
SCC	1,064 (95.51)	464 (95.28)		293 (96.07)	294 (96.39)	
Others	50 (4.49)	23 (4.72)		12 (3.93)	11 (3.61)	
Differentiation			0.2643			0.0678
Missing	409 (36.71)	122 (25.05)		0 (0.00)	0 (0.00)	
Well	26 (2.33)	10 (2.05)		12 (3.93)	9 (2.95)	
Moderate	514 (46.14)	263 (54.00)		220 (72.13)	218 (71.48)	
Poorly	165 (14.81)	92 (18.89)		73 (23.93)	78 (25.57)	
Clinical stage			0.0894			0.0084
II	175 (15.71)	93 (19.10)		56 (18.36)	57 (18.69)	
III	939 (84.29)	394 (80.90)		249 (81.64)	248 (81.31)	
cT stage			0.1682			0.2349
I and II	135 (12.12)	82 (16.84)		37 (12.13)	57 (18.69)	
III	886 (79.53)	357 (73.31)		243 (79.67)	215 (70.49)	
IV	93 (8.35)	48 (9.86)		25 (8.20)	33 (10.82)	
cN stage			0.1435			0.1250
0	121 (10.86)	59 (12.11)		44 (14.43)	34 (11.15)	
I	505 (45.33)	187 (38.40)		118 (38.69)	117 (38.36)	
II	374 (33.57)	188 (38.60)		113 (37.05)	116 (38.03)	
III	114 (10.23)	53 (10.88)		30 (9.84)	38 (12.46)	
CCI score			0.0912			0.0448
≤2	202 (18.13)	91 (18.69)		57 (18.69)	57 (18.69)	
3–4	288 (25.85)	139 (28.54)		77 (25.25)	73 (23.93)	
5–8	256 (22.98)	97 (19.92)		64 (20.98)	61 (20.00)	
>8	368 (33.03)	160 (32.85)		107 (35.08)	114 (37.38)	
BMI (kg/m <sup>2</sup> )			0.2933			0.0700
Missing	281 (25.22)	67 (13.76)		37 (12.13)	42 (13.77)	
<18.5	124 (11.13)	60 (12.32)		40 (13.11)	41 (13.44)	
18.5–24	472 (42.37)	251 (51.54)		160 (52.46)	160 (52.46)	
>24	237 (21.27)	109 (22.38)		68 (22.30)	62 (20.33)	
Smoking			0.3325			0.0619
Missing	267 (23.97)	58 (11.91)		29 (9.51)	34 (11.15)	
Never smoking	101 (9.07)	54 (11.09)		34 (11.15)	36 (11.80)	
Current smoking	525 (47.13)	283 (58.11)		178 (58.36)	177 (58.03)	
Smoking cessation	221 (19.84)	92 (18.89)		64 (20.98)	58 (19.02)	
Hospital volume <sup>†</sup>			0.2146			0.0784
High	804 (72.17)	301 (61.81)		217 (71.15)	211 (69.18)	
Medium	235 (21.10)	137 (28.13)		55 (18.03)	65 (21.31)	
Low and very low	75 (6.73)	49 (10.06)		33 (10.82)	29 (9.51)	
IGRT			0.5268			0.1062
Non-IGRT	917 (82.32)	288 (59.14)		217 (71.15)	202 (66.23)	
IGRT	197 (17.68)	199 (40.86)		88 (28.85)	103 (33.77)	

<sup>†</sup>, hospital volume was classified based on the average number of people treated for esophageal cancer annually: if the number was among the top 25% in Taiwan, the hospital volume was considered high; if the number was in the top 25–50%, the hospital volume was medium; and if the number was in the bottom 50%, the hospital volume was low and very low. PSM, propensity score matching; IMRT, intensity-modulated radiotherapy; rIMRT, rotational IMRT; ASD, absolute standardized difference; NOS, non-specific; SCC, squamous cell carcinoma; cT, clinical T; cN, clinical N; CCI, Charlson Comorbidity Index; BMI, body mass index; IGRT, image-guided radiation therapy.

**Table S2** Exposure quantity statistics are classified according to dose and IMRT

RT highest dose	IMRT (n=1,114), %	rIMRT (n=487), %	P value
3,000–<4,000	7.27	3.70	<0.001
4,000–<5,000	43.81	32.24	
5,000–5,040	37.16	41.89	
>5,040	11.76	22.18	

IMRT, intensity-modulated radiotherapy; RT, radiotherapy; rIMRT, rotational IMRT.

**Table S3** Exposure quantity statistics are classified according to dose and IGRT

RT highest dose	Non-IGRT (n=1,205), %	IGRT (n=396), %	P value
3,000–<4,000	5.15	9.34	0.001
4,000–<5,000	41.24	37.37	
5,000–5,040	40.00	34.34	
>5,040	13.61	18.94	

IGRT, image-guided radiation therapy; RT, radiotherapy.