

Table S1 Univariable analysis for BCSS in early-stage CBC patients

Characteristic	BCSS	
	HR (95% CI)	P value
Demographic-associated characteristic		
Race		
White	Reference	
Black	1.62 (1.35–1.95)	<0.000
Others	0.87 (0.69–1.11)	0.261
CoL index of state of residence		
≤1,000		
>1,000	1.06 (0.94–1.20)	0.347
Age at CBC diagnosis (years)		
≤50	Reference	
51–60	0.80 (0.67–1.95)	0.010
>60	0.80 (0.68–0.92)	0.003
Interval time (months)		
0–2	Reference	
3–59	1.40 (1.22–1.60)	<0.001
60–119	1.03 (0.86–1.22)	0.760
≥120	0.55 (0.37–0.80)	0.002
FPBC-associated characteristic		
Grade of FPBC		
I	Reference	
II	1.88 (1.54–2.30)	<0.000
III/IV	2.98 (2.44–3.64)	<0.000
Histology of FPBC		
IDC	Reference	
ILC	1.33 (1.10–1.61)	0.004
Mixed ILC	0.90 (0.74–1.09)	0.291
Others	0.95 (0.78–1.17)	0.657
Stage of FPBC		
Stage I	Reference	
Stage II	2.28 (1.97–2.65)	<0.000
Stage III	5.92 (5.04–6.96)	<0.000
ER status of FPBC		
Positive	Reference	
Negative/borderline	1.59 (1.38–1.83)	<0.000

Table S1 (continued)

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Characteristic	BCSS	
	HR (95% CI)	P value
PR status of FPBC		
Positive	Reference	
Negative/borderline	1.49 (1.31–1.70)	<0.000
Surgery type for FPBC		
BCS	Reference	
Mastectomy	1.41 (1.24–1.59)	<0.000
CBC-associated characteristic		
Grade of CBC		
I	Reference	
II	1.54 (1.24–1.89)	<0.000
III/IV	1.58 (1.24–2.03)	<0.000
Histology of CBC		
IDC	Reference	
ILC	1.04 (0.86–1.27)	0.659
Mixed ILC	0.89 (0.74–1.08)	0.231
Others	0.97 (0.77–1.22)	0.797
T classification of CBC		
T1	Reference	
T2	2.40 (2.11–2.73)	<0.000
N classification of CBC		
N0	Reference	
N1	2.35 (2.06–2.67)	<0.000
ER status of CBC		
Positive	Reference	
Negative/Borderline	1.82 (1.58–2.11)	<0.000
PR status of CBC		
Positive	Reference	
Negative/borderline	1.76 (1.54–2.00)	<0.000
Surgery type for FPBC		
BCS+RT	Reference	
Mastectomy	1.58 (1.38–1.81)	<0.000

BCSS, breast cancer-specific survival; HR, hazard ratio; CI, confidence interval; FPBC, first primary breast cancer; CBC, contralateral breast cancer; BCS, breast-conserving surgery; RT, radiotherapy; CoL, cost-of-living; IDC, infiltrating ductal carcinoma; ILC, infiltrating lobular carcinoma; ER, estrogen receptor; PR, progesterone receptor.

Table S2 Baseline characteristics between BCS plus RT and mastectomy in early-stage CBC patients after PS matching

Characteristic	BCS + RT (n=1,449)	Mastectomy (n=1,449)	Total (n=1,449)	SMD
Demographic-associated characteristic				
Race				0.023
White	1,166 (80.47)	1,154 (79.64)	2,320 (80.06)	
Black	158 (10.90)	161 (11.11)	319 (11.01)	
Others	125 (8.63)	134 (9.25)	259 (8.94)	
CoL index of state of residence				0.023
≤1,000	555 (38.30)	539 (37.20)	1,094 (37.75)	
>1,000	894 (61.70)	910 (62.80)	1,804 (62.25)	
Age at CBC diagnosis (years)				0.039
≤50	291 (20.08)	281 (19.39)	572 (19.74)	
51–60	432 (29.81)	408 (28.16)	840 (28.99)	
>60	726 (50.10)	760 (52.45)	1486 (51.28)	
Interval time (years)				0.099
<0.25	223 (15.39)	180 (12.42)	403 (13.91)	
0.25–4	515 (35.54)	501 (34.58)	1,016 (35.06)	
5–9	485 (33.47)	509 (35.13)	994 (34.30)	
≥10	226 (15.60)	259 (17.87)	485 (16.74)	
FPBC-associated characteristic				
Grade of FPBC				0.038
I	359 (24.78)	341 (23.53)	700 (24.15)	
II	583 (40.23)	577 (39.82)	1,160 (40.03)	
III/IV	507 (34.99)	531 (36.65)	1,038 (35.82)	
Histology of FPBC				0.045
IDC	1,062 (73.29)	1,100 (75.91)	2,162 (74.60)	
ILC	83 (5.73)	73 (5.04)	156 (5.38)	
Mixed ILC	162 (11.18)	135 (9.32)	297 (10.25)	
Others	142 (9.80)	141 (9.73)	283 (9.77)	
Stage of FPBC				0.001
Stage I	826 (57.00)	825 (56.94)	1,651 (56.97)	
Stage II	517 (35.68)	518 (35.75)	1,035 (35.71)	
Stage III	106 (7.32)	106 (7.32)	212 (7.32)	
ER status of FPBC				0.056
Positive	1,086 (74.95)	1,050 (72.46)	2136 (73.71)	
Negative/borderline	363 (25.05)	399 (27.54)	762 (26.29)	

Table S2 (continued)

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Characteristic	BCS + RT (n=1,449)	Mastectomy (n=1,449)	Total (n=1,449)	SMD
PR status of FPBC				0.056
Positive	958 (66.11)	914 (63.08)	1,872 (64.60)	
Negative/borderline	475 (32.78)	510 (35.20)	985 (33.99)	
Unknown	16 (1.10)	25 (1.73)	41 (1.41)	
Surgery type for FPBC				0.011
BCT	1,204 (83.09)	1,198 (82.68)	2,402 (82.88)	
Mastectomy	245 (16.91)	251 (17.32)	496 (17.12)	
CBC-associated characteristic				
Grade of CBC				
I	322 (22.22)	339 (23.40)	661 (22.81)	0.012
II	622 (42.93)	601 (41.48)	1223 (42.20)	
III/IV	505 (34.85)	509 (35.13)	1014 (34.99)	
Histology of CBC				0.027
IDC	1,093 (75.43)	1,082 (74.67)	2,175 (75.05)	
ILC	129 (8.90)	126 (8.70)	255 (8.80)	
Mixed ILC	156 (10.77)	161 (11.11)	317 (10.94)	
Others	71 (4.90)	80 (5.52)	151 (5.21)	
T classification of CBC				0.002
T1	1,135 (78.33)	1,134 (78.26)	2,269 (78.30)	
T2	314 (21.67)	315 (21.74)	629 (21.70)	
N classification of CBC				0.007
N0	1,156 (79.78)	1,160 (80.06)	2,316 (79.92)	
N1	293 (20.22)	289 (19.94)	582 (20.08)	
ER status of CBC				0.003
Positive	1,089 (75.16)	1,091 (75.29)	2,180 (75.22)	
Negative/borderline	360 (24.84)	358 (24.71)	718 (24.78)	
PR status of CBC				0.066
Positive	908 (62.66)	858 (59.21)	1,766 (60.94)	
Negative/borderline	533 (36.78)	577 (39.82)	1,110 (38.30)	
Unknown	8 (0.55)	14 (0.97)	22 (0.76)	

PS, propensity score; SMD, standardized mean difference; FPBC, first primary breast cancer; CBC, contralateral breast cancer; BCS, breast-conserving surgery; RT, radiotherapy; CoL, cost-of-living; IDC, infiltrating ductal carcinoma; ILC, infiltrating lobular carcinoma; ER, estrogen receptor; PR, progesterone receptor.

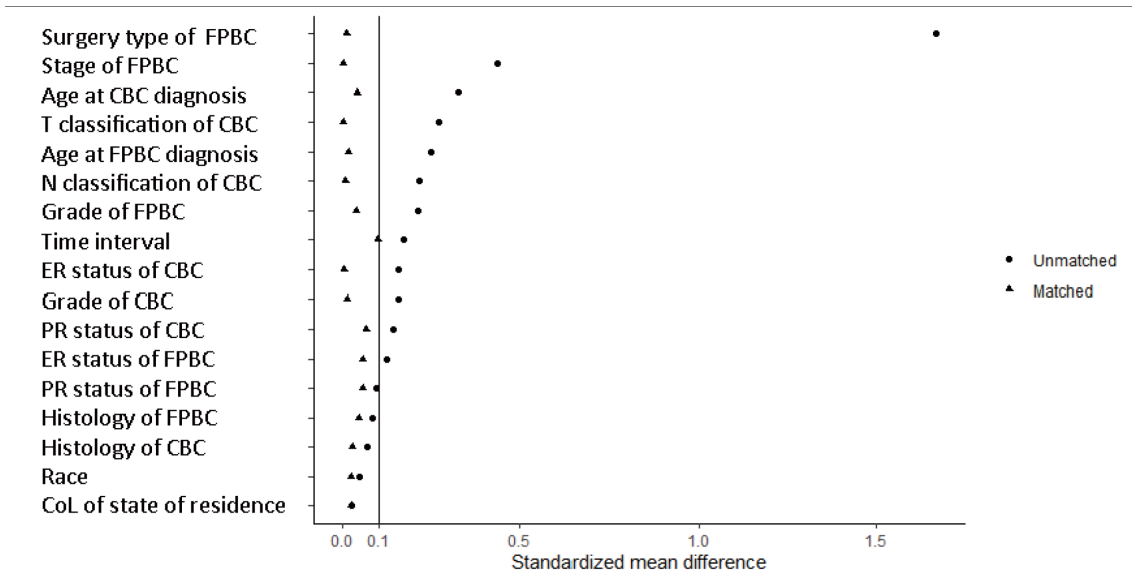


Figure S1 Absolute standardized mean differences for baseline covariates between BCS plus RT and mastectomy in the unmatched and the matched sample. FPBC, first primary breast cancer; CBC, contralateral breast cancer; BCS, breast-conserving surgery; RT, radiotherapy; CoL, cost-of-living; ER, estrogen receptor; PR, progesterone receptor.

Table S3 Baseline characteristics between BCS plus RT and mastectomy plus RT in early-stage CBC patients after PS matching

Characteristic	BCS + RT (n=712)	Mastectomy + RT (n=178)	Total (n=890)	SMD
Demographic-associated characteristic				
Race				0.028
White	574 (80.62)	140 (78.65)	714 (80.22)	
Black	84 (11.80)	25 (14.04)	109 (12.25)	
Others	54 (7.58)	13 (7.30)	67 (7.53)	
CoL index of state of residence				0.049
≤1,000	277 (38.90)	65 (36.52)	342 (38.43)	
>1,000	435 (61.10)	113 (63.48)	548 (61.57)	
Age at CBC diagnosis (years)				0.048
≤50	133 (18.68)	31 (17.42)	164 (18.43)	
51–60	228 (32.02)	55 (30.90)	283 (31.80)	
>60	351 (49.30)	92 (51.69)	443 (49.78)	
Interval time (years)				0.083
<0.25	236 (33.15)	49 (27.53)	285 (32.02)	
0.25–4	165 (23.17)	50 (28.09)	215 (24.16)	
5–9	209 (29.35)	49 (27.53)	258 (28.99)	
≥10	102 (14.33)	30 (16.85)	132 (14.83)	
FPBC-associated characteristic				
Grade of FPBC				0.013
I	167 (23.46)	45 (25.28)	212 (23.82)	
II	295 (41.43)	69 (38.76)	364 (40.90)	
III/IV	250 (35.11)	64 (35.96)	314 (35.28)	
Histology of FPBC				0.016
IDC	533 (74.86)	135 (75.84)	668 (75.06)	
ILC	43 (6.04)	11 (6.18)	54 (6.07)	
Mixed ILC	84 (11.80)	18 (10.11)	102 (11.46)	
Others	52 (7.30)	14 (7.87)	66 (7.42)	
Stage of FPBC				0.092
Stage I	318 (44.66)	85 (47.75)	403 (45.28)	
Stage II	295 (41.43)	74 (41.57)	369 (41.46)	
Stage III	99 (13.90)	19 (10.67)	118 (13.26)	
ER status of FPBC				0.029
Positive	537 (75.42)	132 (74.16)	669 (75.17)	
Negative/borderline	175 (24.58)	46 (25.84)	221 (24.83)	

Table S3 (continued)

Table S3 (continued)

Characteristic	BCS + RT (n=712)	Mastectomy + RT (n=178)	Total (n=890)	SMD
PR status of FPBC				0.005
Positive	461 (64.75)	116 (65.17)	577 (64.83)	
Negative/borderline	245 (34.41)	61 (34.27)	306 (34.38)	
Unknown	6 (0.84)	1 (0.56)	7 (0.79)	
Surgery type for FPBC				0.018
BCT	482 (67.70)	119 (66.85)	601 (67.53)	
Mastectomy	230 (32.30)	59 (33.15)	289 (32.47)	
CBC-associated characteristic				
Grade of CBC				0.011
I	158 (22.19)	42 (23.60)	200 (22.47)	
II	302 (42.42)	72 (40.45)	374 (42.02)	
III/IV	252 (35.39)	64 (35.96)	316 (35.51)	
Histology of CBC				0.033
IDC	519 (72.89)	129 (72.47)	648 (72.81)	
ILC	67 (9.41)	20 (11.24)	87 (9.78)	
Mixed ILC	80 (11.24)	21 (11.80)	101 (11.35)	
Others	46 (6.46)	8 (4.49)	54 (6.07)	
T classification of CBC				0.003
T1	493 (69.24)	123 (69.10)	616 (69.21)	
T2	219 (30.76)	55 (30.90)	274 (30.79)	
N classification of CBC				0.083
N0	445 (62.50)	104 (58.43)	549 (61.69)	
N1	267 (37.50)	74 (41.57)	341 (38.31)	
ER status of CBC				0.075
Positive	547 (76.83)	131 (73.60)	678 (76.18)	
Negative/borderline	165 (23.17)	47 (26.40)	212 (23.82)	
PR status of CBC				0.157
Positive	463 (65.03)	103 (57.87)	566 (63.60)	
Negative/borderline	244 (34.27)	75 (42.13)	319 (35.84)	
Unknown	5 (0.70)	0 (0.00)	5 (0.56)	

PS, propensity score; SMD, standardized mean difference; BCS, breast-conserving surgery; RT, radiotherapy; FPBC, first primary breast cancer; CBC, contralateral breast cancer; CoL, cost-of-living; IDC, infiltrating ductal carcinoma; ILC, infiltrating lobular carcinoma; ER, estrogen receptor; PR, progesterone receptor.

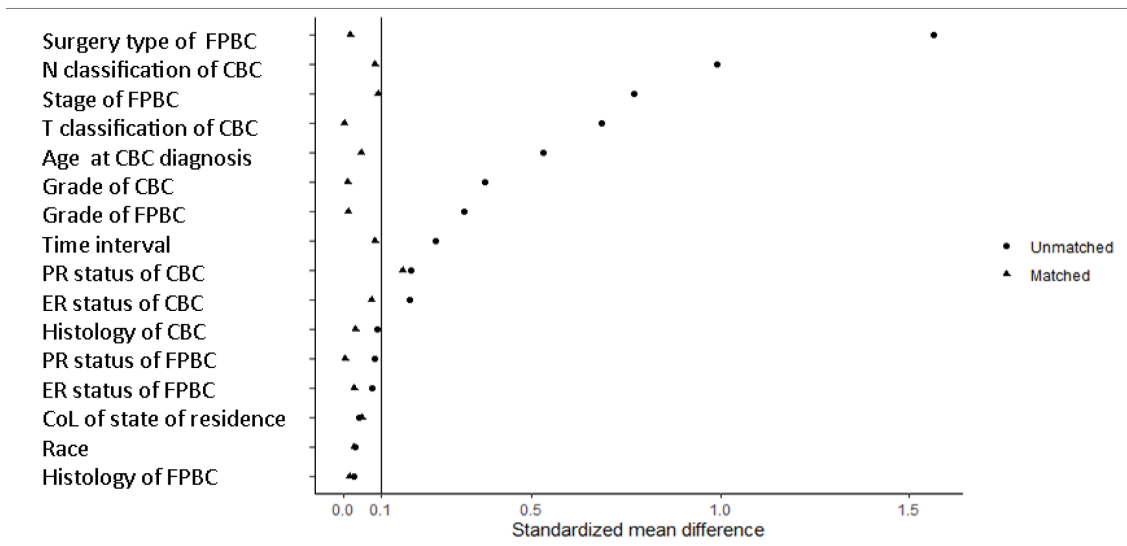


Figure S2 Absolute standardized mean differences for baseline covariates between BCS plus RT and mastectomy plus RT in the unmatched and the matched sample. FPBC, first primary breast cancer; CBC, contralateral breast cancer; BCS, breast-conserving surgery; RT, radiotherapy; CoL, cost-of-living; ER, estrogen receptor; PR, progesterone receptor.

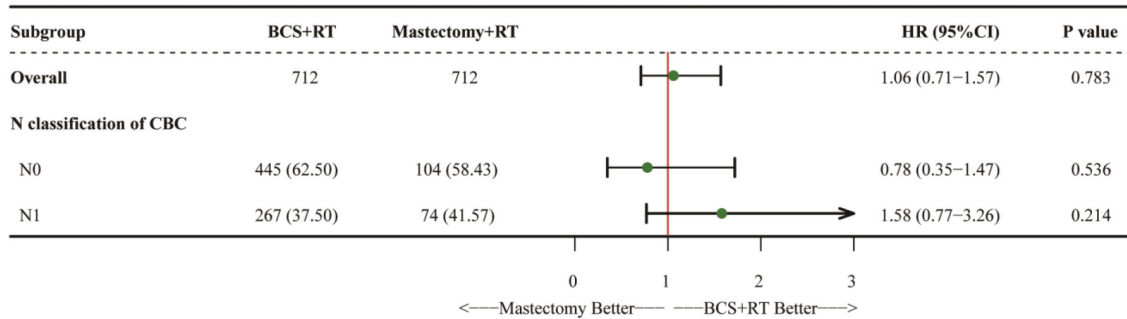


Figure S3 Multivariable analysis for BCSS as compared between BCS plus RT and mastectomy plus RT in early-stage CBC patients after PS matching. Adjusted, if not be stratified, for age at CBC diagnosis, time interval, stage of FPBC, T and N classification of CBC, histology and hormone receptors status of both cancers, and surgery type for FPBC. BCSS, breast cancer-specific survival; HR, hazard ratio; CI, confidence interval; FPBC, first primary breast cancer; CBC, contralateral breast cancer; BCS, breast-conserving therapy; RT, radiotherapy.