Supplementary File

Table S1. The breast clinical and planning target volumes, lung and heart volumes, and breast planning target volume diameter of each patient

Volumes	CTV_Breast [mL]	PTV_Breast [mL]	Lung [mL]	Heart [mL]	PTV diameter [cm]
Pt. 1	527.7	848.9	1199.1	652.3	26.1
Pt. 2	200.0	441.4	2165.8	467.5	24.4
Pt. 3	359.5	739.0	2022.5	530.1	28.2
Pt. 4	907.5	1364.3	2696.4	611.0	28.2
Pt. 5	277.7	581.7	2512.0	515.0	25.2
Pt. 6	267.8	599.3	2557.7	653.6	29.1
Pt. 7	508.7	765.1	1706.4	544.0	20.4
Pt. 8	332.9	588.2	3418.4	504.0	24.3
Pt. 9	108.8	300.1	2555.6	411.3	22.8
Pt. 10	616.7	941.9	1862.0	481.0	24.6
Pt. 11	231.2	604.4	3328.3	714.3	23.4
Pt. 12	595.7	834.2	2838.6	668.0	25.2
Pt. 13	225.6	460.0	2332.2	424.9	28.5
Pt. 14	285.1	567.7	2549.6	521.5	25.3
Pt. 15	460.2	818.5	2109.5	743.3	25.0
Mean	393.7	697.0	2390.3	562.8	25.4
SD	205.3	251.1	481.6	101.1	2.4

CTV — clinical target volume; PTV — planning target volume; SD — standard deviation

Table S2. Comparison of the cardiac dose in this study with those findings reported in the literature

	Irradiated areas	**3DCRT Mean ± SD [Gy]**	**IMRT Mean ± SD [Gy]**	**T-VMAT Mean ± SD [Gy]**	**A-VMAT Mean ± SD [Gy]**	**HD-VMAT Mean ± SD [Gy]**	**Prescribed dose Gy/fraction**	**Remarks**
The present study	Left breast and subclavian + IMN	7.2 ± 2.8	-	9.0 ± 3.1	8.0 ± 2.7	6.7 ± 1.5	50/25	
Zhao et al., 2016 [1]	Left breast and subclavian + IMN	-	10.6 ± 5.0	-	7.2 ± 2.7 (2 arcs) /7.8 ± 2.3 (1 arc)	-	50/25	
Xi et al., 2017 [2]	Left breast only	-	5.9 ± 1.3	5.4 ± 1.0	5.8 ± 0.9	–	60, 50/25	SIB
Zhao et al., 2015 [3]	Left breast only	–	2.8 ± 1.0 (2 fields)/ 3.0 ±	3.3 ± 1.3	3.7 ± 1.4	–	50/25 or 60/30	

			1.4 (4 fields)					

3DCRT — three-dimensional conformal radiotherapy; IMRT — fixed gantry intensity-modulated radiation therapy; VMAT — volumetric modulated arc radiotherapy; T-VMAT — tangential volumetric modulated arc therapy, including partial arcs; A-VMAT — volumetric modulated arc therapy using the Millennium 120-leaf MLC or other types of MLC, except for HD-MLC; IMN — internal mammary node; SIB — simultaneous integrated boost; SD — standard deviation

References

[1] Zhao LR, Zhou YB, Sun JG. Comparison of plan optimization for single and dual volumetric-modulated arc therapy versus intensity-modulated radiation therapy during post-mastectomy regional irradiation. Oncol Lett. 2016;11(5):3389-3394. doi:10.3892/ol.2016.4376.

[2] Xi D, Ding Y, Hu R, Gu W, Mu J, Li Q. Advantages of a technique using two 50 degree arcs in simultaneous integrated boost radiotherapy for left-sidebreast cancer. Sci Rep. 2017;7(1):14748. doi:10.1038/s41598-017-15307-7.

[3] Zhao H, He M, Cheng G, et al. A comparative dosimetric study of left sided breast cancer after breast-conserving surgery treated with VMAT and IMRT. Radiat Oncol. 2015;10:231. doi:10.1186/s13014-015-0531-4.

Figure S1. Beam setting of the different radiotherapy plans. The top and bottom rows show the beam settings for the cranial and caudal sides, respectively. The yellow arrows indicate the irradiation direction. Beam setting of three-dimensional conformal radiotherapy (a.1, a.2), high-definition multi-leaf collimator HD-VMAT (b. 1, b. 2), tHD-VMAT (c. 1, c. 2), and M-VMAT (d. 1, d. 2). The contours shown are the clinical target volume (navy) and planning target volume (red).

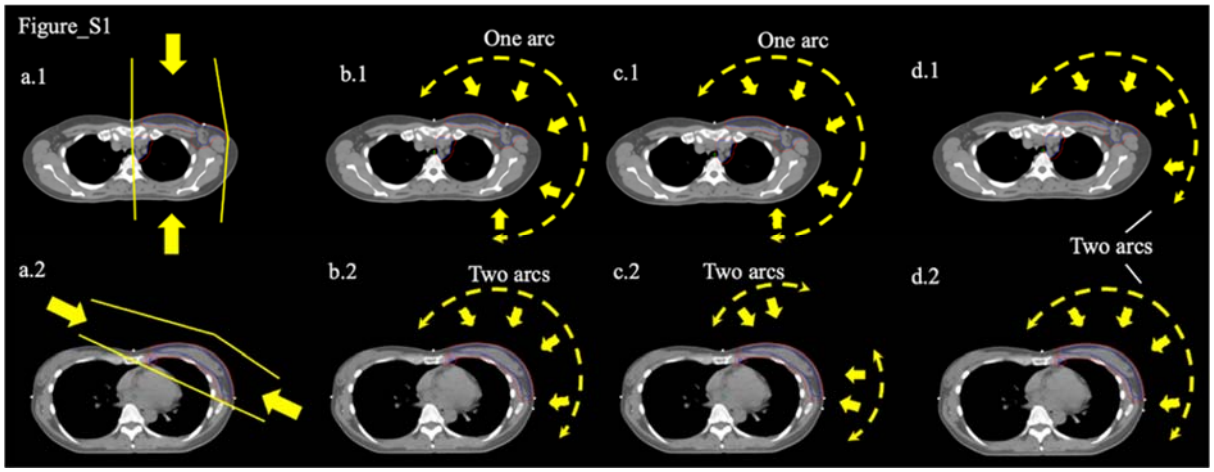

Figure S2. Average dose–volume histograms for the CTV (a), PTV (b), PTV_IM (c), lungs (d), heart (e), and contralateral breast (f) with ± 1 SD for HD-VMAT (red line), tHD-VMAT (green line), 3DCRT (blue line), and M-VMAT (black dashed line).