

D<sub>max</sub> were 96%, 98%, 100% and 104% of the prescribed dose, respectively. All organs at risk (OARs) constraints were fulfilled (Table). No toxicity >G2 was reported either at the end of radiotherapy or at the 12-months examination. With a median follow-up time of 45 months (interquartile range 17-67), overall survival, disease-free survival and local control are 100%.

**Table:** Dose/volume constraints and planning values.

OARs	Constraints	Planning values [Gy]
Heart	D <sub>15%</sub> < 20 Gy	7.55 (4.7-17)
	D <sub>20%</sub> < 15 Gy	6.4 (4.4-14.3)
Ipsilateral Lung	D <sub>15%</sub> < 35 Gy	26.9 (19.5-32.2)
	D <sub>20%</sub> < 30 Gy	24.1 (17.6-29.3)
	D <sub>35%</sub> < 20 Gy	17.3 (11.9-20.3)
	D <sub>50%</sub> < 15 Gy	13.2 (7.7-14.5)
Contralateral Lung	D <sub>20%</sub> < 15 Gy	7.3 (4.0-13.1)
	D <sub>35%</sub> < 12 Gy	5.7 (3.0-11.1)
	D <sub>50%</sub> < 10 Gy	4.6 (3.0-10)
	D <sub>15%</sub> < 20 Gy	5.3 (3.4-7.0)
Contralateral Breast	D <sub>20%</sub> < 10 Gy	4.6 (3.2-6.6)
	D <sub>35%</sub> < 7 Gy	4.1 (2.8-5.7)
	D <sub>50%</sub> < 5 Gy	3.3 (2.6-4.8)

### Conclusion

The POLO approach is safe and technically feasible and resulted in high dose conformity of the target with a significant reduction of radiation dose delivered to the previous IORT area. A larger population and a longer follow-up are needed to better evaluate the clinical outcome.

### EP-1312 Evaluation of MRI-based guidelines for contouring tumors for preoperative partial breast irradiation

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### Purpose or Objective

The goal of this study was to evaluate recently developed expert consensus contouring guidelines in delineating primary breast cancers using MRI in a preoperative setting.

### Material and Methods

MRI-based contouring guidelines for target definition of primary breast tumors on dynamic contrast enhanced (DCE) MRI in supine position were developed by experienced breast radiation oncologists from the International MR-Linac Consortium and a dedicated breast radiologist. Using these guidelines, the gross tumor volume (GTV) was delineated by 6 breast radiation oncologists on 10 pre-treatment DCE-MRI scans from 10 cT1N0 breast cancer patients treated with single-dose preoperative partial breast irradiation (ABLATIVE trial, ClinicalTrials.gov: NCT02316561) in a first contouring

session. Clinical target volumes (CTV) were created by expanding the GTV by 2cm, while excluding skin and chest wall. After the first contouring session, the MRI-based guidelines were adapted, since the observers noted that the distinction between the contrast-enhanced tumor and surrounding vessels and glandular breast tissue was difficult in several cases. Therefore, the final guidelines recommended delineation on the DCE-MRI obtained after approximately 60-120 seconds vs. 300 seconds in the first guidelines. Guidelines did not change on using a diagnostic DCE-MRI (in prone position) to verify tumor spiculae and on including the fiducial marker in the GTV. After a 6-month interval, 5 breast radiation oncologists re-delineated 6 of the 10 cases using the updated guidelines. Three radiation oncologists were common to both meetings. We assessed the mean delineated volumes and the interobserver variation (IOV) during the two sessions. IOV was based on the generalized conformity index (CI). The CI was calculated using the following equation:  $CI = (\sum \text{pairs } ij |Ai \cap Aj|) / (\sum \text{pairs } ij |Ai \cup Aj|)$ .

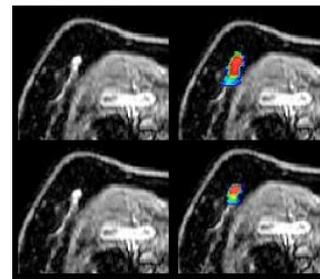
### Results

Following the first contouring session, the conformity indices of GTV varied between 0.28 and 0.77, and of CTV between 0.77 and 0.94 (Table 1). Following the second session, the conformity indices of GTV varied between 0.34 and 0.77, and of CTV between 0.78 and 0.94 (Table 1). The largest variation was observed in patients with increased glandular breast tissue enhancement, with a tumor close to large vessels or with large tumor spiculae (Figure 1).

**Table 1.** GTV and CTV conformity index per patient and moment of delineation. A CI of 1 indicates no interobserver variation, a lower CI indicates higher interobserver variation. \* = Was not delineated during this session. † = based on five observers, one observer delineated another structure than the tumor, this was considered an outlier and removed from the analysis.

Mean GTV volume (in ml)		Conformity index GTV		Mean CTV volume (in ml)		Conformity index CTV	
Session 1	Session 2	Session 1	Session 2	Session 1	Session 2	Session 1	Session 2
2.2	2.2	0.77	0.77	59.7	59.0	0.94	0.94
0.2	*	0.48	*	37.1	*	0.89	*
1.0	0.5	0.57	0.54	29.2	23.0	0.82	0.88
0.6	0.6	0.42	0.43	33.8	34.0	0.87	0.83
1.4	1.3	0.64	0.68	66.8	66.2	0.91	0.93
0.9	*	0.66	*	47.6	*	0.93	*
2.2	*	0.67	*	87.8	*	0.88	*
0.6	*	0.64	*	55.1	*	0.92	*
2.4	2.4	0.65	0.69	84.6	83.7	0.90	0.90
1.5 †	2.0	0.28 †	0.34	54.6 †	59.7	0.77 †	0.78

**Figure 1.** Coronal view of delineations of patient 3 during the first (upper row) and second (lower row) session, a blood vessel can be observed caudal of the tumor. Red= delineation by all observers, blue= delineation by 1 observer.



### Conclusion

Using expert-developed MRI-based contouring guidelines resulted in a relatively high interobserver variation in GTV and a low interobserver variation in CTV. The high interobserver variation in GTV can largely be attributed to small breast tumor volumes ( $\leq 1.5$  ml), and artifacts caused by markers and contrast-enhancement of surrounding vessels and breast tissue. In the context of 20mm expansion margins, small discrepancies in GTV contouring do not translate into significant variations in CTV.

### EP-1313 Adjuvant radiotherapy for primary squamous cell carcinoma of the breast

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