

INTRODUCTION

Accelerated Partial Breast Irradiation (APBI) with external beam intensity modulated radiation therapy has emerged as an excellent treatment strategy for select early-stage breast cancer patients, with reduced volume irradiated and potentially better cosmesis compared to whole breast irradiation.

AIM

Our institutional preference for APBI consists of 3000cGy in 5 non-consecutive fractions with IMRT per the Florence protocol¹. Our institution has revised this protocol, however, to include deep-inspiration breath-hold (DIBH) for motion management. Additionally, the CTV to PTV margin has been reduced from 10-mm to 5-mm for such patients, in light of reduction in uncertainty of target localization by use of a radiopaque filament (FM) placed in the lumpectomy cavity at time of surgery and reduction in motion uncertainty using DIBH and daily CBCT. We report on our series of patients treated using this technique, highlighting the reduction in breast volume irradiated using this novel strategy.

METHOD

This is a retrospective chart review of patients treated with APBI using FM for lumpectomy cavity visualization and DIBH for immobilization from 2021-2023. All patients included in this study were treated with DIBH and daily CBCT prior to each fraction using FM to assist in alignment. The treatment PTV, generated using a CTV to PTV expansion of 5mm was compared to a research PTV using a 10mm expansion from the CTV per Florence protocol. Both the clinical and research PTVs were allowed to extend 4 mm inside the ipsilateral lung and were limited to 3 mm from the skin. The difference in the volumes were reported to highlight the impact of this novel technique in breast-sparing.

CONCLUSIONS

For patients treated with 5-fraction external beam APBI, the use of DIBH for motion management and filament marker for target localization appears to allow for safe reduction in CTV-to-PTV expansion without reduction in local control. Absolute reduction in PTV with this approach is substantial, with potential implications for cosmetic outcome or other late effects. Longer term follow up will be needed to confirm the durability of these local control and toxicity results and may offer potential for improved cosmesis results.

RESULTS

Table 1. Baseline cohort tumor characteristics

	N=76 (n,%)		N=76 (n,%) (continued)	
Histology			LVSI (invasive only)	
	DCIS	18 (24%)	None	57 (98%)
	IDC	53 (70%)	Focal	1 (2%)
	ILC	1 (1%)		
IMC	4 (5%)	Margins		
		Neg(>5mm)	29 (38%)	
Tumor grade			2-5mm	39 (51%)
	1	21 (28%)	<2mm	8 (11%)
	2	51 (67%)		
3	4 (5%)	Risk class		
		Suitable	61 (80%)	
Median tumor size	0.7 cc		Cautionary	15 (20%)
			Unsuitable	0 (0%)

- Compared to the results of “standard” 10-mm CTV to PTV expansion, the use of 5-mm CTV to PTV margin reduced the mean PTV size by 112 cc (> 80% average absolute volume reduction).
- With a median follow up of 23.1 months, local control was 100%
- There were no cases of subacute radiation pneumonitis.

REFERENCES

¹Meattini, Icro, et al. "Accelerated partial-breast irradiation compared with whole-breast irradiation for early breast cancer: Long-term results of the randomized phase III APBI-IMRT-Florence trial." *Journal of Clinical Oncology* 38.35 (2020): 4175-4183

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