

2 Preventive Care and Screening Adherence Among Women Surviving Breast Cancer

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Background/Significance

Preventive care and screening adherence are essential to long-term follow-up for breast cancer survivors, enabling detection of recurrence and guiding overall health maintenance. Routine physical exams, mammograms, and Pap smears are recommended. Barriers to adherence over time can be addressed by community-based organizations by providing information and supportive services, including navigation to screening. We studied adherence to preventive care and screening among breast cancer survivors who engaged a national cancer control community-based organization—examining how sociodemographics, cancer care factors, and quality of life were associated with adherence.

Materials and Methods

A secondary data analysis was conducted among breast cancer survivors ($n = 777$) who contacted the community-based organization for resources, including no-cost patient navigation. Patient-reported outcomes were assessed after 30 days, along with survivorship care plan (SCP) quality and quality of life. An index score was created based upon women's self-reported adherence to receiving

routine physical exams, mammograms, and Pap smears at recommended intervals.

Results

Among survivors, 37% were age ≤ 46 years, 19% were non-White, 63% were in a partnered relationship, 23% rated their quality of life (general health) as fair/poor, and 47% carried a pathogenic variant in *BRCA*. Medical providers caring for these survivors were primary care physicians (53.6%) and oncology specialists (46.4%). For index scores, 66% were adherent to all 3 recommendations for follow-up, 29% to 2 recommendations, and 6% to ≤ 1 recommendation. The most adhered to recommendation was a physical exam (97%), and the least was a Pap smear (73%); 88% of survivors reported mammograms biannually. At the bivariate level, survivors who were younger ($t, df = 4.59, 711, P < .001$), non-White ($t, df = -3.27, 267, P < .001$), in a partnered relationship ($t, df = 1.76, 54, P < .05$), and with better quality of life ($r = -.09, P < .01$) were more adherent. A trend was observed for SCP quality; survivors who received written summaries (56%), including follow-up instructions (64%), and in written form (45%), were more likely to adhere ($r = .05, P < .10$). In a multivariable regression model adjusting for partnership status and SCP quality, younger survivors ($B = 1.13, P < .001$), who were non-White ($B = 1.0, P < .01$), and with better quality of life ($B = .09, P < .05$) were more adherent.

Conclusion

Survivors can be navigated to guideline-based prevention and screening with community-based organization-led support. Tailored SCPs are essential to reinforce life-saving health behaviors and improve follow-up adherence.

3 Intraoperative Radiotherapy: Alive and Well in the Bronx

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Background/Significance

Partial breast irradiation (PBI) is an attractive option for women with early-stage breast cancer, with equivalent local control rates to whole breast irradiation (WBI). Intraoperative radiotherapy (IORT) is one method of PBI that allows women to complete adjuvant radiotherapy at the time of breast conserving surgery (BCS). In this current study, we seek to evaluate outcomes of women treated with IORT at our institution in the Bronx, New York.

Materials and Methods

This is a single-center, prospective, observational, institutional review-board-approved registry trial of patients treated with IORT using the Intrabeam system from January 2018 to January 2024. Eligible patients included women aged 45 years and older who were candidates for BCS with estrogen receptor-positive, cT1 to 2N0 invasive ductal carcinoma, or grade 1 to 2 ductal carcinoma in-situ (DCIS). Exclusion criteria included known *BRCA* mutation, neoadjuvant chemotherapy, or multicentric disease. Following BCS, patients received a single dose of 20 Gy to the lumpectomy cavity surface with 50kVp x-rays. Those with high-risk features on final pathology—positive margins with disease on re-excision, positive lymph nodes, tumor size > 3.5 cm or high-grade DCIS—were recommended adjuvant WBI. The primary outcome was locoregional recurrence.

Secondary outcomes were overall survival and wound-healing complications.

Results

Between January 2018 and January 2024, 257 women were treated with IORT. The median age was 65.8 years, and most patients (76.7%) identified as non-White. Ten patients were treated with bilateral breast IORT, equating to 267 treated lumpectomy cavities. The majority of the 267 treated tumors were pathologically T1 (n = 197, 73.8%), followed by Tis (n = 37, 13.9%), T2 (n = 31, 11.6%), and T0 (n = 1, 0.4%). Forty-three patients (16.6%) were recommended adjuvant WBI due to high-risk pathology, 37 (86.0%) of whom proceeded.

Median follow-up was 3.2 years (range, 0.4-78 months), during which 6 patients had biopsy-proven ipsilateral breast tumor recurrences, yielding a recurrence rate of 2.2%. Overall survival was 98%, and 10 patients (3.9%) had wound-healing complications.

Conclusion

In our cohort of primarily minority patients, IORT demonstrated a 97.8% locoregional control rate and spared 83.4% of women from the added physical and financial toxicity of WBI. IORT may serve as an economical and safe alternative for women seeking more personalized breast cancer treatment and with limited resources for longer radiotherapy regimens.

4 Evaluating AI-Driven Responses in Breast Reconstruction: A Comparative Study of Response Formats

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Background/Significance

Artificial intelligence (AI) is increasingly applied in medicine with significant potential to streamline information retrieval, data processing, and the delivery of comprehensible insights. In breast cancer care, AI's ability to enhance patient care and improve surgical outcomes is of growing interest. Recently, the accuracy of AI models, such as ChatGPT, in addressing questions about breast reconstruction has garnered interest. While previous studies have examined ChatGPT's reliability in responding to patient queries, its role as a decision-support tool for surgeons remains largely unexplored.

Materials and Methods

This study evaluated the reliability of recent open AI models, specifically ChatGPT versions 4.0 and 01, in answering standardized in-service plastic surgery exam questions on breast reconstruction. For questions available in both text and image-

based formats, ChatGPT 4.0's accuracy was evaluated with and without images, as it is the only model capable of processing visual inputs. A total of 5 questions were asked, including 1 question available in both text and image-based formats. Responses were assessed against a standardized answer key. Four physicians reviewed the model's responses across multiple chat sessions, comparing performance on open-ended vs multiple-choice formats.

Results

ChatGPT version 4.0 achieved an average accuracy of 75% in open-ended questions, which increased to 85% in multiple-choice formats. ChatGPT 01, which incorporates reasoning abilities, also scored 75% on open-ended questions but increased to 85% accuracy with multiple-choice. ChatGPT 4.0 demonstrated 100% accuracy on text and image-based open-ended question. However, its performance did not show any significant change with the inclusion of images in the multiple choice format.

Conclusion

The 2 AI models showed distinct strengths depending on the question format—some excelled with structured prompts, while others performed better with open-ended questions with images. AI shows potential as a supplementary tool in breast reconstruction education and decision-making, but its effectiveness is context-dependent. Aligning model strengths with clinical needs is key to maximizing its value alongside expert knowledge.

10 AI as a Bridge: Can ChatGPT Help Patients Understand Their Breast Radiology Reports?

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Background/Significance

Large language models such as ChatGPT are increasingly used by patients to understand radiology reports. Studies have demonstrated that most patients have an 8th grade reading comprehension level. Readability metrics can assess whether radiology reports are close to a patient's level of understanding. Our study aimed to evaluate whether ChatGPT model 4 could improve readability of breast imaging reporting and data system (BI-RADS) categories 3, 4, and 5 reports while maintaining accuracy.

Materials and Methods

Fifteen consecutive BI-RADS 3, BI-RADS 4, and BI-RADS 5 source reports were retrieved from the radiology database. ChatGPT prompts were given as follows: "please put the report into layperson terms" and "please provide recommendations for the patient." ChatGPT prompts generated layperson reports and recommendations for all 45 source reports.

Readability of source reports, layperson reports, and layperson recommendations were analyzed for each BI-RADS category using Flesch-Kincaid readability score in grade level and word counts. Flesch-Kincaid score is an established tool used to assess health literacy. Grade level scores define the reading comprehension grade level. High word count is associated poorer readability. A

radiologist evaluated the accuracy of ChatGPT-generated outputs by identifying inaccurate/misleading information and whether the layperson reports contained beneficial supplementary information not found in the original report. Statistical analysis was performed using 2-sided unpaired, equal-variance t-tests.

Results

Statistically significant decrease in mean grade level was identified for BI-RADS 3 source vs layperson reports (mean grade level, 10.9; SD = 1.8; vs mean grade level, 8.8; SD = 1.0; $P = .003$), and for BI-RADS 5 source vs layperson reports (mean grade level, 12.2; SD, 3.0; vs mean grade level, 9.6; SD = 0.8; $P = .003$). No statistical difference was seen in grade level between source reports and ChatGPT-generated recommendations for all 3 BI-RADS categories (**Table 1**).

There was a statistically significant decreased word count for BI-RADS 3 and BI-RADS 4 source vs ChatGPT-generated recommendations ($P = .001$ and $P = .02$, respectively). No statistically significant difference was observed between word count of source and layperson reports for all 3 BI-RADS categories.

ChatGPT-generated reports did not contain inaccurate or misleading information; however, the reports did offer beneficial supplementary information, particularly in terms of biopsy recommendations, compared with source reports.

Conclusion

ChatGPT improved readability (grade level) for BI-RADS 3 and 5 reports, and produced less wordy recommendations for BI-RADS 3 and 4 reports. ChatGPT-generated reports did not contain inaccurate information that would affect patient management. ChatGPT could be used to generate patient-friendly reports, which could potentially lessen patient anxiety surrounding breast imaging.

Table 1. Mean Grade Level Scores With Accompanying Standard Deviations in Parentheses of Source Reports, ChatGPT-Generated Layperson Reports, and Recommendations for Each BI-RADS Category

	Source reports	ChatGPT-generated layperson reports	P value	ChatGPT-generated recommendations	P value
BI-RADS 3	10.9 (1.8)	8.8 (1.0)	.003	10.7 (1.0)	.72
BI-RADS 4	14.7 (5.3)	9.6 (1.0)	.06	11.7 (1.0)	.73
BI-RADS 5	12.2 (3.0)	9.6 (0.8)	.003	12.1 (1.4)	.9

BI-RADS, breast imaging reporting and data system.

54 The Treatment of Breast Cancer With Percutaneous Thermal Ablation: Results of the THERMAC Trial

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Background/Significance

Percutaneous thermal ablation has the potential to replace surgical treatment and improve the health-related quality of life of patients with small breast cancers, without jeopardizing current treatment effectiveness or safety. The objective of this study was to determine the efficacy rate in terms of complete ablation for the most promising techniques of thermal ablation: radiofrequency ablation (RFA), microwave ablation (MWA), and cryoablation (CA) for patients with early-stage breast cancer to warrant a randomized, phase 3 trial comparing thermal ablation with surgery.

Materials and Methods

This was an investigator-initiated, randomized, phase 2 “pick a winner” study in postmenopausal patients with cT1N0 estrogen receptor–positive, HER2-negative breast cancer. Patients were randomly assigned to undergo RFA, MWA or CA, and underwent surgical resection 3 months after thermal ablation. The optimal

technique should meet the minimum requirements of a complete ablation rate of at least 85%, a complication rate of $\leq 15\%$, and completion of the treatment without interruption due to pain or discomfort in at least 80% of patients. The primary outcome was proportion of patients with complete pathological response at pathology examination; secondary outcomes included ability to complete the thermal ablative procedure in an outpatient setting and the occurrence of adverse events (AEs).

Results

A total of 41 patients were included. Treatment in the RFA arm was terminated prematurely due to reaching a protocol defined stopping rule after 5 inclusions. Eighteen patients were treated with MWA and CA. All techniques were user-friendly and showed excellent feasibility in an outpatient setting. Complete ablation was reached in 72% (95% CI, 49%-88%) in the MWA arm and in 94% (95% CI, 74%-99%) in the CA arm. AEs occurred in 44% (95% CI, 25%-66%) and 0% (95% CI, 0%-18%) of patients in the MWA and CA arms, respectively.

Conclusion

Cryoablation was the only thermal ablative technique that met the minimum requirements and will therefore be selected for the phase 3 trial.

Table 1. Primary and Secondary Outcomes^{a,b}

	RFA (n = 5)	MWA (n = 18)	CA (n = 18)
Pain (mean \pm SD/median, IQR)			
Before TA	1 (0)	1 (0)	1 (0)
Immediately after TA	2 (1-5.3)	3 (1-5)	1 (1-3)
24 hours after TA	1 (1-1.3)	1 (1-2)	1 (1-2)
SUS total score (mean \pm SD)	68.5 (5.8)	70.6 (9.6)	78.2 (7.1)
Adverse events	0.60 (0.23-0.88)	0.44 (0.25-0.66)	0.00 (0.00-0.18)
Complete ablation on pathology	0.20 (0.04-0.62)	0.72 (0.49-0.88)	0.94 (0.74-0.99)
Volume of the ablation zone (cm³) (median, IQR)			
MRI, 2 weeks	657.0 (63.5-1629.0)	618.0 (326-983.0)	385 (303.3-862.3)
MRI, 12 weeks	532.0 (72.0-767.5)	326.0 (98.0-627.0)	152.0 (82.8-314.3)
Pathology	212.0 (124.5-286.0)	147.0 (40.0-203.0)	86.5 (15.3-112.8)

CA, cryoablation; IQR, interquartile range; MWA, microwave ablation; RFA, radiofrequency ablation; SD, standard deviation; SUS, system usability scale; TA, thermal ablation.

^aOutcomes are represented as proportions with exact 95% CI unless otherwise indicated.

61 Can the Use of Tumor Margin Markers for Intraoperative Specimen Radiographs Decrease the Rate of Margin Positivity During Breast Conservation Therapy?

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Background/Significance

The margin status after a lumpectomy is critical to determine the risk of local recurrence. Current guidelines recommend “no ink on tumor” as adequate negative margins for invasive carcinoma. Several studies report that up to 40% of patients may have positive margins requiring a second operation for excision. As such, controversy exists regarding the intraoperative management of margins, with some groups supporting routine cavity shave margins and others favoring selective margin excision based on examination of the specimen plus interpretation of intraoperative radiographs. We hypothesized that a commercially available tumor marking system used at the time of specimen radiography will help reduce the rate of margin positivity.

Materials and Methods

After Institutional Review Board approval, a retrospective review of a prospectively collected cohort of patients was conducted. We included patients older than 18 years diagnosed with invasive breast cancer undergoing breast conservation therapy. At the completion of the lumpectomy, the specimen margins were labeled using clips from the selected commercial tumor marking system; this was followed by a 2-view radiography to determine if shave margins needed to be obtained. The distance between the margin and the tumor border was recorded using a standard millimeter ruler. The

radiograph was interpreted by the lead surgeon and shave margins (selective vs complete) were excised at the discretion of the lead surgeon as well. A control group with similar patient characteristics was composed using the same inclusion criteria. In this group, the commercial tumor marking system was not utilized, and the management of the margins was determined by the lead surgeon. Continuous variables are presented as mean with standard deviation and compared using t-test. Categorical variables are presented as frequencies and percentages and compared using χ^2 tests or Fisher exact tests, as applicable (Table). Significance level was set at 0.05. Analyses were performed using SAS software (Version 9.4).

Results

One hundred and five patients in the study group were compared with 92 patients in the control group. The mean age in both groups was 63 and 64 years, respectively. In the study group, 39% of the cohort underwent selective shave margin excision, and 7% underwent complete margin excision based on the use of the tumor marking system. The control group had a 42% rate of selective margin excision and a significantly higher rate of complete margin excision of 20%. No margins were excised in 53% of the study group vs 37% on the control group. Final pathology of the study and control groups demonstrated positive margins in 23% and 20%, respectively, with no significant difference between the groups.

Conclusion

The use of the tumor marking system did contribute to decreasing the number of patients requiring either selective or complete margin excision; however, no significant difference was found between the groups regarding the rate of margin positivity among the patients who underwent margin excision with and without the use of the tumor marking system.

Table. Comparison of Patient Characteristics and Outcomes Between the Study Group and the Control Group

	All Patients	Study Group	Control	
Characteristic	(N = 197)	(n = 105)	(n = 92)	P Value
Age, mean (SD)	64.10 (12.06)	63.53 (11.07)	64.75 (13.11)	.4806
Race, mean (SD)				
Black	12 (6.15)	7 (6.67)	5 (5.56)	.7934
Other	13 (6.67)	8 (7.62)	5 (5.56)	
White	170 (87.18)	90 (85.71)	80 (88.89)	

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Continued from p. 64

Surgery, mean (SD)				
No margins excised	90 (45.69)	56 (53.33)	34 (36.96)	.0105
Selective margins excised	80 (40.61)	41 (39.05)	39 (42.39)	
Complete margin excision	27 (13.71)	8 (7.62)	19 (20.65)	
Positive margins, mean (SD)				
No	153 (77.66)	80 (76.19)	73 (79.35)	.5955
Yes	44 (22.34)	25 (23.81)	19 (20.65)	

SD, standard deviation.

63 Intraoperative Radiation and External Beam Radiation After Breast-Conserving Surgery in an Ethnic Minority Population: Patient Reported Outcomes Using BREAST-Q

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Background/Significance

Intraoperative radiation therapy (IORT) is a one-time, safe radiation option for select patients with early-stage breast cancer after breast-conserving surgery (BCS). We sought to compare patient-reported outcomes between patients who received IORT and those who received partial or whole-breast external beam radiation therapy (EBRT).

Materials and Methods

Patients who completed BREAST-Q Breast Conserving Therapy Module Version 2.0 pre- and postoperative (1-3 weeks and 3 months, respectively) questionnaires and underwent BCS with IORT or EBRT from June 2020 to March 2024 at our institution were included. Descriptive, t-test, and Chi-square tests were used for analysis. Given the selection criteria for IORT as defined by our in-house registry trial and the TARGIT randomized trial, we conducted a subanalysis to compare patients who underwent BCS with IORT with patients who qualified for IORT but received EBRT.

Results

We identified 135 patients; 26 received IORT and 109 received EBRT including 34 who qualified for IORT but received EBRT. There were 106 ethnic minority patients: Black (47.9%), Asian (1.68%), and Other (39.5%). At 1 to 3 weeks post operation, patients who received IORT compared with patients who received EBRT reported worse physical well-being of the chest (57.35 vs 64.67; $P = .045$) and psychosocial well-being (73.64 vs 78.49; $P = .027$). However, by 3 months post operation, patients who received IORT reported better well-being of the chest (75.17 vs 67.09; $P = .210$) and similar psychosocial well-being (75.08 vs 75.98; $P = .188$). Comparison of patients who received IORT to those who qualified for IORT but received EBRT showed similar results. The latter group reported higher satisfaction with breast cosmesis at 3 months post operation (68.75 vs 76.19; $P = .075$). Patients who received IORT reported better quality of life with regards to adverse effects (AEs) of radiation at 3 months post operation (82.00 vs 67.03; $P = .143$).

Conclusion

In our ethnic minority population, patients who received IORT initially reported worse physical well-being of the chest and psychosocial well-being compared with those who received EBRT, but this difference was no longer present 3 months after surgery, and had improved in those who received IORT. Patients who received IORT had better quality of life with regards to AEs of radiation at 3 months post operation, although it was not statistically significant, likely due to our small cohort. Surprisingly, patients who qualified for IORT but received EBRT were more satisfied with breast cosmesis at 3 months post operation, though it was not statistically significant. Further studies with greater power and longer follow-up are needed.

75 Comparing 21-Gene Assay Recurrence Scores Before and After Preoperative Radiation Boost in Patients Enrolled in a Phase 2 Prospective Clinical Trial

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Background/Significance

Early-stage breast cancer is commonly treated with breast-conserving surgery (BCS) followed by whole breast irradiation (WBI). A radiation boost to the tumor bed is also recommended in some cases, is dependent on patient age and disease characteristics, and is usually delivered following BCS and WBI. We conducted a prospective, phase 2 clinical trial (NCT04871516) in which the radiation boost was delivered preoperatively instead of postoperatively, the first results of which have been previously published. Due to concerns that the preoperative radiation boost could possibly alter the genomic profile of the tumor, we compared the 21-gene assay results (Oncotype DX Breast Recurrence Score) before and after the boost, to see if a change may have altered systemic therapy.

Materials and Methods

Patients received a preoperative boost of 13.32 Gy in 4 daily fractions, followed by BCS 1 to 3 weeks after, followed by WBI of 36.63 Gy in 11 daily fractions 3 to 8 weeks after surgery. A total of 55 patients were enrolled in the trial. We randomly selected 17 patients to compare the 21-gene assay results before and after the boost. We used paired Student's t-test to see whether the difference between the 2 sets of scores is statistically significant.

Results

Tissue was sufficient to run the assay on the core needle biopsy and the lumpectomy specimens in 15 patients. All patients had clinically negative axillary nodes. The median age at diagnosis was 68 years (range, 53-79). Average tumor size was 13.15 mm (range, 7-21). There were 3 lobular, 1 mucinous, and 11 ductal invasive carcinomas. All tumors were hormone receptor-positive and HER2-negative. The mean 21-gene assay result prior to the radiation boost was 12 (\pm SD, 7.92), and after was 13.47 (\pm SD 6.93). Paired Student's t-test showed no significant difference between the pre- and postirradiation results ($t = 0.5399$, $P = .6$). In 9 of 15 (60%) patients, the results of the 21-gene assay slightly increased after the boost by an average of 4.78 points (\pm SD, 2.05), and in 6 of 15 (40%), they slightly decreased by an average of 3.5 points (\pm SD, 2.74). In none of these 15 patients would the preoperative boost have altered systemic therapy.

Conclusion

In this cohort of patients from our preoperative radiation boost trial, results of the 21-gene assay were not significantly changed after the radiation boost. This indicates that, in this protocol, preoperative radiation boost would likely not alter systemic therapy decisions.

Crucial Answers on Long-Term Physical Health Effects From Breast Cancer Treatments

A recent study highlights the greatest decline in physical health was observed with chemotherapy plus endocrine therapy for patients with breast cancer. Clara Bodelon, PhD, MS, spoke about the results from this study and the significance observed when patients treated with chemotherapy experienced more difficulties with day-to-day tasks.

BODELON DISCUSSED THIS AND MORE IN AN EXCLUSIVE INTERVIEW WITH CANCERNETWORK REGARDING THESE FINDINGS



SCAN TO READ

81 Assessing Recurrence Likelihood in Hormone Receptor-Positive/HER2-Negative Breast Cancer Patients Directly From MRI Using Imaging AI

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Background/Significance

Early-stage hormone receptor (HR)-positive, HER2-negative breast cancer is treated with endocrine therapy with or without chemotherapy. Commercially available genomic assays may not fully capture disease heterogeneity when performed on a single tissue block. Radiographic imaging with multi-modal AI allows for a global assessment of tumor heterogeneity. We developed and tested an AI-based model incorporating pretreatment dynamic contrast-enhanced (DCE)-MRI with clinicopathologic factors to predict recurrence risk in HR-positive/HER2-negative breast cancer.

Materials and Methods

A multi-institutional cohort of 1072 women diagnosed with invasive HR-positive/HER2-negative breast cancer who had follow-up and pretreatment DCE-MRI was identified. Institutions were assigned to either algorithm training or testing, resulting in datasets with 522 and 550 women, respectively. An AI risk

model was developed that utilized clinicopathological data (age, race/ethnicity, T stage, N stage, grade) and image-based spatial features of the tumor and surrounding tissues derived from the DCE-MRI (Figure 1A, B). The risk model was calibrated on the training dataset to produce a score correlating with probability of loco-regional recurrence or distant recurrence (hereafter RP). High- and low-risk of recurrence categories were defined by optimizing a threshold in the training dataset. Finally, the risk model was assessed in the testing dataset using this threshold.

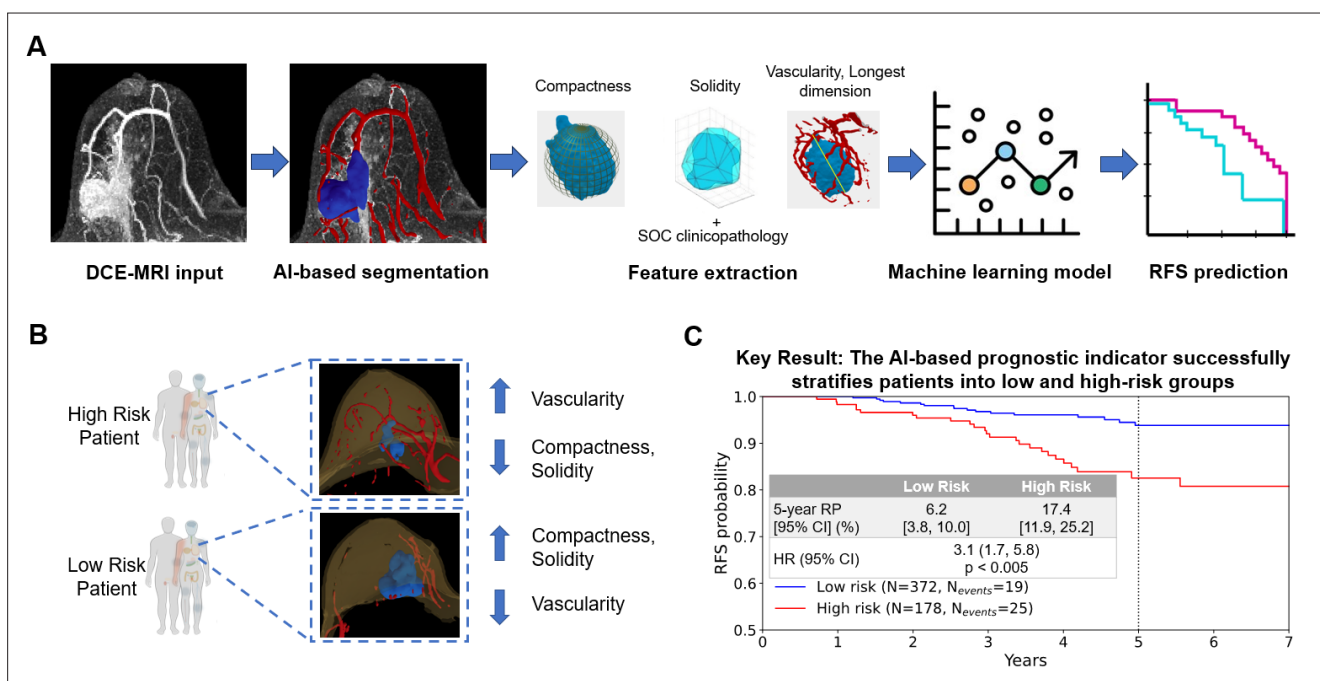
Results

In the test cohort, patients had a median follow-up time of 4.5 years, median age of 54 ± 11 years, and 15.6% were African American. The majority of women had T1-T2 disease (89.6%), and 34.4% had 1 to 3 involved lymph nodes. The 5-year RP for women predicted to be low-risk was 6.2% (95% CI, 3.8%-10.0%) compared with 17.4% (95% CI, 11.9%-25.2%) for women predicted to be high-risk (Figure 1C). The adjusted hazard ratio including clinicopathologic factors between low- and high-risk groups was 3.1 (95% CI, 1.7-5.8; *P* < .005). Similar hazard ratios between low- and high-risk were observed in important subgroups: node negative (3.6; 95% CI, 1.6-8.1), node positive (2.2; 95% CI, 0.8-5.9), age < 50 years (2.5; 95% CI, 1.0-6.2), and age > 50 years (2.9; 95% CI, 1.2-6.8).

Conclusion

Our AI-based prognostic tool incorporating imaging allows personalized treatment planning in real time in women with early-stage HR-positive/HER2-negative breast cancer. The prognostic benefit exceeded that of clinical features alone and was observed regardless of age and lymph node involvement.

Figure 1. A) AI model development includes whole-tumor imaging and clinicopathologic variables. B) Spatial characteristics correlate with recurrence risk. C) Results in the independent testing dataset.



91 Adverse Effects and Financial Burden of Radiation Therapy in Patients With T3N0M0 Luminal Breast Cancer

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Background/Significance

There is no definite recommendation regarding post-mastectomy radiation therapy (PMRT) in patients with T3N0M0, luminal breast cancer. We have previously shown that in patients with hormone receptor (HR)-positive, HER2-negative tumors and low recurrence prediction scores experience a comparable rate of recurrence irrespective of PMRT. Radiation therapy adds morbidity including dermatitis/fibrosis, breast/chest wall pain, impaired mobility, breast/arm edema, and cardiac adverse effects (AEs). Our goal is to investigate the AEs of radiation therapy and to use Medicare reimbursement data to assess the financial burden of radiation therapy in this patient population.

Materials and Methods

We performed a retrospective chart review of all female patients at our institution with T3N0M0, HR-positive, HER2-negative breast cancer who underwent mastectomy between 2012 and 2022. Patients were divided into 2 groups based on the administration of PMRT, and early and late AEs of PMRT were recorded. We then analyzed the cost of radiation therapy based on Medicare

reimbursement data. The additional cost of treating radiation therapy-related AEs was not included.

Results

Of the 84 patients who met the study criteria, 56% (n = 47) underwent PMRT, and 44% (n = 37) did not. The mean age was 60.9 years (\pm 13.0), and the median follow-up was 82 months (range, 4-152). There was no statistical difference in age, mean estrogen receptor (ER) or progesterone receptors (PR) H-score, or T stage between the PMRT and no-radiation therapy groups. In the PMRT group, 27% (n = 10) of patients had immediate breast reconstruction.

There was no significant difference in local recurrence rates (2.1% and 5.4% in the PMRT and no-PMRT groups, respectively; $P = .42$), or distant recurrence rates (8.5% and 4.3% in the PMRT and no-PMRT groups, respectively; $P = .58$). Radiation therapy-related local complication was seen in 26 patients; minor skin toxicity (hyperpigmentation, telangiectasia, skin thickening, n = 20), major skin toxicity (n = 2), dehiscence/necrosis (n = 1), Lichen sclerosus (n = 1), angiosarcoma (n = 1), implant capsular contraction (n = 1), and cardiac events were seen in 29 patients (events related with coronary artery disease, stroke, arrhythmia). In this cohort, radiation therapy would cost Medicare an additional \$656,619 (\$13,970 per patient).

Conclusion

In the T3N0M0, HR-positive, HER2-negative breast cancer group, radiation therapy did not reduce the recurrence rate of breast cancer, but it significantly increased morbidity and costs. Consistent with the SUPREMO trial result, omitting radiation could reduce patient AEs and financial stress in this patient population.

92 Near-Infrared Fluorescence Imaging With Indocyanine Green vs Isosulfan Blue for Sentinel Lymph Node Mapping: Comparative Cost Analysis in Early-Stage Breast Cancer

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Background/Significance

Sentinel lymph node (SLN) mapping is essential in the surgical

management of early-stage breast cancer. Isosulfan blue is traditionally used but has drawbacks such as persistent skin staining and allergic reactions. Near-infrared fluorescence (NIRF) imaging with indocyanine green has emerged as a safe, effective, and cost-effective alternative. This study evaluated outpatient revisit costs associated with NIRF with indocyanine green vs isosulfan blue to explore the economic implications of adopting indocyanine green.

Materials and Methods

This retrospective, observational study analyzed data from adult female patients diagnosed with breast cancer undergoing sentinel lymph node mapping with isosulfan blue or NIRF with indocyanine green, indexed to outpatient hospital discharge between July 1, 2017, and August 31, 2022. Data were extracted

from the US hospital-based PINC AI Healthcare Database. Patients were grouped based on the SLN mapping method utilized. Costs at 30, 60, and 90 days post procedure were assessed and adjusted to 2022 US dollars using the Medical Care Consumer Price Index.

Results

Among the 1,067,677 patients identified, 5.6% (n = 60,068) underwent SLN, with 11.8% (n = 7,076) meeting inclusion criteria. Outpatient revisit costs to the same hospital for the NIRF with indocyanine green cohort compared with the isosulfan blue cohort were \$36 lower at 30 days (\$3832 ± \$5106 [median, \$1,058] vs \$3868 ± \$4842 [median, \$2020], *P* = NS), \$845 lower at 60 days (\$7,023 ± \$9,360 [median, \$3,112] vs \$7868 ± \$8658 [median, \$4740], *P* < .05,

statistically significant), and \$774 lower at 90 days (\$10,015 ± \$13,215 [median, \$5,445] vs \$10,789 ± \$12,166 [median, \$5,879], *P* = NS). A hospital performing 100 SLN mapping procedures annually could save approximately \$84,500 per year and \$422,500 over 5 years in revisit costs with NIRF with indocyanine green, assuming \$845 saved per case.

Conclusion

NIRF with indocyanine green for SLN mapping in breast cancer shows a trend toward cost savings compared with isosulfan blue, particularly at 60 days post procedure. These findings highlight the potential economic benefit of adopting NIRF with indocyanine green in clinical practice and warrant further research into its long-term cost-effectiveness and clinical outcomes.

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104 Identification of Ductal Carcinoma In Situ Patients With Low-Risk Clinicopathology Who Benefit From Radiation Therapy With and Without Endocrine Therapy After Breast-Conserving Surgery Assessed With the 7-Gene Biosignature

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Background/Significance

The 7-gene biosignature provided better identification of patients with low 10-year ipsilateral breast recurrence (IBR) rates and no significant radiation therapy benefit compared with using clinicopathology low-risk criteria. Importantly, the biosignature classified over half of women with low-risk clinicopathology treated with endocrine therapy as High Risk. This group received a substantial benefit from radiation therapy, while those with biosignature Low Risk did not.

Materials and Methods

Women (n = 926) from 4 ductal carcinoma in situ (DCIS) cohorts treated with breast-conserving surgery had tissue samples analyzed at a CLIA lab. Clinicopathology low risk was defined using RTOG 9804-like criteria (no ink on tumor) or Memorial Sloan Kettering Cancer Center (MSKCC)-like criteria using nomogram-weighted factors (low-risk score < 220, excluding re-excision number, no ink on tumor, and radiation therapy treatment). Women were also classified as molecular Low Risk (decipher score (DS) ≤ 2.8, no residual risk subtype, RRT) or High

Risk (DS > 2.8, ± RRT) using the biosignature. Ten-year IBR Kaplan-Meier rates and Cox proportional hazard ratios (HRs) were calculated for endocrine therapy and radiation therapy.

Results

Overall, 66% of 926 women were classified as low risk by clinicopathology criteria (Radiation Therapy Oncology Group [RTOG] or MSKCC). Patients with clinicopathology low-risk treated without endocrine therapy (n = 315) had a 10-year IBR of 13% after breast-conserving surgery without radiation therapy and 7% with radiation therapy (HR, 0.51; *P* = .10), while those treated with endocrine therapy (n = 291) had a 10-year IBR of 9% after breast-conserving surgery without radiation therapy and 4% with radiation therapy (HR, 0.39; *P* = .09).

37% of women were classified as decipher score low risk (n = 338) by the biosignature with a 10-year IBR of 5.6% after breast-conserving surgery with no significant endocrine therapy (IBR, 3.6%; HR, 0.66, *P* = .41) or radiation therapy benefit (IBR, 2.7%; HR, 0.88; *P* = .78). Patients with concordant clinicopathology low-risk and biosignature Low Risk (n = 269) had a 5.5% 10-year IBR after breast-conserving surgery and no significant radiation therapy (IBR, 5.5%; HR, 1.10; *P* = .87) or endocrine therapy benefit (IBR, 7.3%; HR, 0.44; *P* = .22).

Also, 48% (n = 151) of clinicopathology low-risk patients treated without endocrine therapy were re-classified as High Risk by the biosignature and had elevated 10-year IBR without radiation therapy (21%) and radiation therapy benefit (IBR, 7%; HR, 0.31; *P* = .03). Also, 59% (n = 173) of clinicopathology low-risk patients treated with endocrine therapy after breast-conserving surgery were classified by biosignature as decipher score High Risk with elevated 10-year IBR without radiation therapy (14%; HR, .67; *P* = .28, vs no endocrine therapy) and radiation therapy benefit (IBR, 5%; HR, 0.22; *P* = .02).

Conclusion

In decipher score low-risk patients, these findings confirm no radiation therapy benefit and suggest no endocrine therapy benefit beyond that seen in the contralateral breast (data not shown). In decipher score high-risk patients without radiation therapy, these data suggest an intermediate endocrine therapy benefit, but for decipher score high-risk patients with radiation therapy, no endocrine therapy benefit beyond that seen in the contralateral breast.