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Treatment patterns for ductal carcinoma in situ with close or positive mastectomy margins



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ABSTRACT

Background: Mastectomy remains an effective treatment for ductal carcinoma in situ (DCIS) but whether further therapy is warranted for close or positive margins is controversial. We aim to characterize the treatment practices of DCIS throughout the United States in patients who undergo mastectomy with close or positive margins to better understand the use of postmastectomy radiation therapy (PMRT).

Materials and methods: Using the 2004-2013 National Cancer Database, we identified all female patients with a diagnosis of DCIS who underwent mastectomy. Distributional characteristics were summarized for overall and margin-stratified samples. Characteristic differences were assessed by region and receipt of radiation. Chi-square and independent sample t-tests were used to assess differences for categorical and continuous variables, respectively.

Results: In 21,591 patients who met inclusion criteria, 470 patients with close/positive margins were identified. Sixteen percent of patients with close/positive margins received PMRT compared to 1.5% with negative margins ($P < 0.01$). There was no difference in PMRT and patient race, insurance status, treatment facility, or endocrine therapy. Patients with close/positive margins who received PMRT were more likely to be in an urban setting from the Midwest (24.6%) and Northeast (21.8%) compared to the West (11.0%) and South (10.7%) ($P < 0.01$).

Conclusions: Use of PMRT for DCIS following mastectomy with close/positive margins differs across the country. Regional variations in treatment patterns reinforce a need to determine whether PMRT improves survival to establish treatment guidelines.

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Introduction

Ductal carcinoma *in situ* (DCIS) is a noninvasive form of breast cancer that accounts for over 20% of all new breast cancer diagnoses in the United States.^{1,2} Treatment involves mastectomy or breast-conserving surgery followed by adjuvant radiation for the goal of preventing locoregional recurrence (LRR).³ Studies have shown that nearly all recurrences following mastectomy for DCIS occur in the ipsilateral chest wall, and most as invasive breast cancer.⁴ Mastectomy is often the preferred option for patients with multifocal or multicentric DCIS,⁵ and the proportion of patients, particularly younger patients, preferring mastectomy over breast-conserving surgery appears to be increasing.⁶ A minority of patients who undergo mastectomy for DCIS have close or positive margins, the only reported independent risk factor for LRR.⁷ The need for further treatment to minimize risk of recurrence remains unclear.

The role of postmastectomy radiation therapy (PMRT) for DCIS following mastectomy with close or positive margins is uncertain.⁸ Some report that patients with margins <2 mm may benefit from PMRT due to greater-than-expected recurrence rates,⁹ whereas others argue that the risk of recurrence is sufficiently low enough not to recommend PMRT,^{10,11} which can lead to complications including pain, skin changes, and breast reconstruction complications. There is no apparent consensus at this time regarding recommendations for PMRT for DCIS following mastectomy with close or positive margins.

We sought to describe current treatment practices for DCIS patients following mastectomy with close or positive margins. We evaluated the distributional differences according to margin classification and characterized these differences in the subgroup of patients with close or positive margins. We examined differences in PMRT by census region to determine whether further treatment guidelines need to be established based on margin status.

Materials and methods

We conducted a retrospective cohort study of patients with a diagnosis of pure DCIS who underwent mastectomy with close (≤ 2 mm) or positive margins. The study protocol was reviewed and approved by the University of Alabama at Birmingham Institutional Review Board.

Study population

Data were obtained from the National Cancer Database (NCDB) 2004-2013 data set. The NCDB is a nationwide oncology outcome database created jointly by the American Cancer Society and American College of Surgeons Commission on Cancer in 1989 that captures clinical and outcome data for patients who receive care at an American College of Surgeons Commission on Cancer–approved center. It includes approximately 70% of newly diagnosed cancer cases in the United States.

We included all female patients aged 18 years and above who had a diagnosis of stage 0 DCIS and underwent

mastectomy with or without reconstruction. Patients with diagnosis of lobular carcinoma *in situ*, invasive carcinoma, or positive sentinel lymph node biopsy were excluded.

Study variables

The main variable of interest was the mastectomy margin status (close/positive versus negative). Close/positive margins were defined as DCIS within 2 mm of the mastectomy pathology specimen. Tumor characteristics (tumor grade, estrogen receptor status, and progesterone receptor status) and patient characteristics (age, race, rurality, insurance status, Charlson comorbidity index 0 versus 1, and census regions of Northeast versus Midwest versus South versus West) were analyzed. Treatment characteristics (use of hormonal blockade [yes versus no] and PMRT [yes versus no]) were also evaluated. Northeast region includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York, and Pennsylvania. Midwest region includes Indiana, Illinois, Michigan, Ohio, Wisconsin, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota. South region includes Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, and Texas. Finally, West region includes Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming, Alaska, California, Hawaii, Oregon, and Washington.

The main outcome of interest was receipt of PMRT. Secondary outcomes of interest were receipt of endocrine therapy and survival.

Statistical analysis

Distributional characteristics were summarized for the overall, margin-stratified, and region-stratified samples using means and standard deviations or frequencies and percentages. We examined characteristic differences in receipt of radiation among all positive/close margin DCIS subjects. Chi-square, Fisher's exact, and independent sample t-tests were used to assess between-group differences in characteristics.

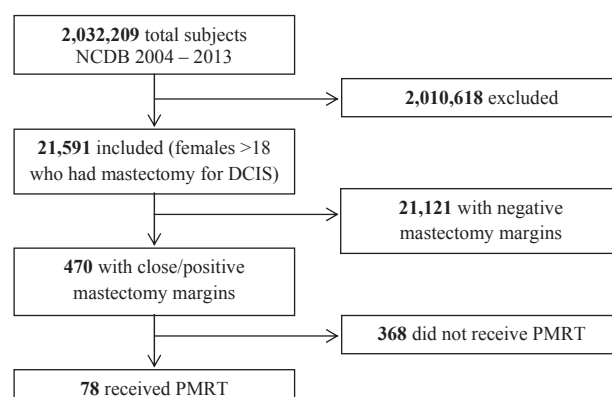


Fig – Study flowchart.

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