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Racial disparities in the use of outpatient mastectomy

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ABSTRACT

Background: Racial disparities exist within many domains of cancer care. This study was designed to identify differences in the use of outpatient mastectomy (OM) based on patient race. **Methods:** We identified patients in the American College of Surgeons National Surgical Quality Improvement Program Participant Use File (during the years 2007–2010) who underwent a mastectomy. The association between mastectomy setting, patient race, patient age, American Society of Anesthesiology physical status classification, functional status, mastectomy type, and hospital teaching status was determined using the chi-square test. A multivariable logistic regression analysis was developed to assess the relative odds of undergoing OM by race, with adjustment for potential confounders. **Results:** We identified 47,318 patients enrolled in the American College of Surgeons National Surgical Quality Improvement Program Participant Use File who underwent a mastectomy during the study time frame. More than half (62.6%) of mastectomies were performed in the outpatient setting. All racial minorities had lower rates of OM, with 63.8% of white patients; 59.1% of black patients; 57.4% of Asian, Native Hawaiian, or Pacific Islander patients; and 43.9% of American Indian or Alaska Native patients undergoing OM ($P < 0.001$). After adjustment for multiple confounders, black patients, American Indian or Alaska Native patients, and those of unknown race were all less likely to undergo OM (odds ratio [OR], 0.86; 95% confidence interval [CI], 0.80–0.93; OR, 0.55; 95% CI, 0.41–0.72; and OR, 0.70; 95% CI, 0.64–0.76, respectively) compared with white patients.

Conclusions: Disparities exist in the use of OM among racial minorities. Further studies are needed to identify the role of cultural preferences, physician attitudes, and insurer encouragements that may influence these patterns of use.

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1. Introduction

The surgical treatment of breast cancer has changed dramatically over the past century. Most notably, breast surgery has become substantially less morbid over time. The

modified radical mastectomy replaced the radical mastectomy in the 1970s, and more recently, the use of breast-conserving surgery has become the standard of care for many patients [1]. Multiple randomized clinical trials have validated the equivalence of survival rates after breast-conserving

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surgery and total breast extirpation for localized breast cancer [2–4], and as a result, most breast cancer patients can comfortably select the procedure of their choice.

Along with the transition to breast-conserving surgery, there has been increasing pressure from third-party payers to decrease inpatient hospitalizations [1]. Outpatient breast cancer surgery has become increasingly popular [5–7] as a means to control health care expenditures. However, despite the migration of breast surgery to the outpatient arena, most complete mastectomies are still being performed in the inpatient setting [8].

Several studies have shown that outpatient breast surgery is safe and beneficial to patients [7,9]. It has been demonstrated that outpatient breast surgery reduces patient exposure to the potential risks and complications of prolonged hospitalization [10–12]. Additionally, recent studies have found that patients who undergo outpatient mastectomy (OM) experience improved psychological outcomes and patient satisfaction [9,13]. As such, OM is a valuable procedure that should be offered to all patients who are acceptable candidates for outpatient surgery. Although racial disparities in breast cancer treatment and outcomes are well documented [14–17], little is known about racial disparities in the use of OM.

This study was designed to investigate the differences in the use of OM based on patient race. We hypothesized that patients from racial minorities would have higher utilization of OM than white patients.

2. Methods

2.1. Database

After receiving exempt status from the Institutional Review Board at the University of Pennsylvania, we performed a retrospective cohort study of patients who underwent a mastectomy and were identified in the American College of Surgeons National Surgical Quality Improvement Program Participant Use File (ACS NSQIP PUF) during the years 2007–2010. The ACS NSQIP PUF is a Health Insurance Portability and Accountability Act–compliant, multi-institutional data source available to researchers affiliated with NSQIP hospitals [18]. The ACS NSQIP PUF contains cases submitted by participating hospitals with associated patient-level aggregate data. The ACS NSQIP PUF data are collected by trained chart reviewers and compiled by the ACS NSQIP. It has been well described elsewhere in the literature [19,20].

2.2. Patient selection

Female patients were selected for inclusion in the study if they had one of the following Current Procedural Terminology (CPT) codes listed: 19,301, 10,302, 19,303, 19,304, 19,305, 19,306, and 19,307. Patients aged <18 y and those who were missing information on race were excluded from the study. To minimize the influence of procedural heterogeneity on the study results, women undergoing concurrent immediate breast reconstruction as defined by CPT codes were excluded from the study.

The term “mastectomy” can be used to describe a broad range of procedures that indicate the excision of breast tissue. Therefore, using CPT codes, we classified the type of mastectomy by the extent of tissue removed. Mastectomy type was defined as “partial” for those undergoing partial mastectomy (CPT 19,301) or partial mastectomy with lymph node removal (CPT 19,302), and mastectomy type was defined as “complete” for those undergoing simple/complete mastectomy (CPT 19,303 or 19,304) or radical/modified radical mastectomy (CPT 19,305–9,307).

2.3. Outcome variable

The primary outcome variable of interest was the setting in which mastectomy was performed: inpatient *versus* outpatient. The inpatient–outpatient designation was determined by the hospital in which the procedure was performed and was collected in the ACS NSQIP database.

2.4. Patient characteristics

The primary independent variable of interest was patient race. For the purposes of our analysis, we identified race as follows: white; black; Asian, Native Hawaiian, or Pacific Islander; American Indian or Alaska Native; or unknown. As the Hispanic designation reflects ethnicity and not race, patients who were classified as black Hispanic, white Hispanic, or unknown Hispanic were collapsed into the black, white, and unknown categories, as appropriate. Patients classified as race unknown, as opposed to missing information, were included in the analysis because racial minorities are more likely to report race unknown than white patients [21].

A parsimonious set of potential confounding variables was retrieved directly from the ACS NSQIP PUF, including patient age, American Society of Anesthesiology physical status classification (ASA class), and functional status. The ASA class is identified in the anesthesia record and reflects the present physical condition of the patient at the time of the surgical procedure. The ASA class was included in the analysis because it has been shown to function as a measure of patient risk or severity of illness in the ACS NSQIP data set [22]. We included a variable for resident participation (yes or no). The resident participation variable served as a proxy for hospital teaching status, a possible confounder for selection of outpatient *versus* inpatient mastectomy. Resident participation was assigned as “yes” if any level of resident was recorded as participating in the procedure.

2.5. Statistical analysis

Descriptive statistics were performed. Univariate analysis was performed to investigate the association between race and mastectomy setting using the chi-square test. A multivariable logistic regression model was developed to assess the relative odds of undergoing an OM (reference group: inpatient mastectomy) by race, with adjustment for potential confounders including mastectomy type, patient age, patient ASA class, patient functional status, and resident participation. An interaction term was used to assess for effect modification between race and procedure type. To examine

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