The American Journal of Surgery (2016) 212, 96-101

The American Journal of Surgery®

Clinical Science

Racial and age disparities persist in immediate breast reconstruction: an updated analysis of 48,564 patients from the 2005 to 2011 American College of Surgeons National Surgery Quality Improvement Program data sets

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KEYWORDS:
Health care disparity;
Breast Reconstruction;
NSQIP

Abstract

BACKGROUND: Immediate breast reconstruction (IBR) rates continue to rise, yet recent patterns based on race, age, and patient comorbidities have not been adequately assessed.

METHODS: Women undergoing mastectomy only or mastectomy with IBR from 2005 to 2011 were identified in the American College of Surgeons–National Surgical Quality Improvement (NSQIP) data sets. A multivariate logistic regression was performed to determine factors independently associated with receipt of IBR. Thirty-day surgical complication rates after IBR were also assessed.

RESULTS: Rates of IBR increased significantly over the study period from 26% of patients in 2005 to 40% in 2011. Non-Caucasian race, older age (≥45 years), obesity, and presence of comorbid conditions including diabetes mellitus, current smoking, and cardiovascular disease were all negatively associated with receipt of IBR. Surgical complication rates after IBR were not predicted by non-Caucasian race, older age, or presence of diabetes mellitus.

CONCLUSIONS: This current assessment of IBR using the American College of Surgeons–National Surgical Quality Improvement data sets demonstrates that non-Caucasian and older women (≥45 years) continue to receive IBR at lower rates despite the lack of association of added risk of surgical morbidity.

Published by Elsevier Inc.

Breast reconstruction after mastectomy has been widely considered an important component of the comprehensive treatment and management of breast cancer patients over the last half of a century. Despite this consensus that

The authors declare no conflicts of interest.

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Manuscript received April 15, 2015; revised manuscript June 29, 2015

0002-9610/$ - see front matter Published by Elsevier Inc.
http://dx.doi.org/10.1016/j.amjsurg.2015.08.025

reconstruction is beneficial for postmastectomy patients, historical evidence has revealed substantial differences in reconstruction rates according to race as well as age.[1–7] Caucasian women have been found to receive immediate breast reconstruction (IBR) significantly more often than African-American and Latino women[1–3,6] and younger women ($\leq$64 years) more frequently than older women ($\geq$65 years).[4,5] The reasons for this have never been fully elucidated and are likely multifactorial. One of the contributing factors has been the concern that because African-American, Latina, and older women frequently have a greater rate of comorbid conditions, they presumably have an increased rate of sustaining a surgical complication if IBR is undertaken.[1,4,5] This presumption has not been investigated on a national level and as our nation's health care system continues to focus on the alleviation of health care disparities according to race and age,[8] a more current assessment of IBR in the United States could be impactful.

The Women's Health and Cancer Rights Act of 1998 mandated that health insurance plans provide complete coverage for all reconstructive procedures related to breast cancer surgery.[9] There has been documented evidence of an increase in the number of women seeking and receiving breast reconstruction since the passage of this law; however, there are concerns that African-American and Latina women and women of advanced age are still lagging in receipt of these procedures compared with the majority population. Immediate reconstruction at the time of mastectomy has taken on greater popularity and is increasingly considered a standard of care. Compared with a delayed approach, IBR offers the potential benefit of fewer operations, decreased costs, better esthetic outcomes due to a preserved skin envelope, and less psychological distress for the patient by avoiding a period of amastia.[10–12]

Prior studies that have assessed race and age pertaining to IBR were single institutions or limited to regional information. In this study, using the American College of Surgeons–National Surgery Quality Improvement Program (ACS-NSQIP) data sets was able to broadly assess the rates of IBR across racial and age groups and determine whether these groups truly are predisposed to added surgical risk. We believe this study will serve to better inform surgeons about the patient selection process and delineate areas for needed improvement to provide greater access to reconstructive services.

Methods

Data sets

We reviewed the 2005 to 2011 ACS-NSQIP data sets identifying encounters for IBR.[13] Patients were placed into cohorts according to race: Caucasian, African-American, Latina, and other; as well as age group: less than 45, 45 to 64, 65 years or more. Obesity was also assessed as patients were placed into groups according to the World Health Organization: nonobese, body mass index (BMI) less than 30 kg/m^2; class I "moderately" obese, BMI of 30 to 34.9 kg/m^2; class II "severely" obese, BMI of 35 to 39.9 kg/m^2; and class III "morbidly" obese, BMI of 40 kg/m^2 or more.[14] Additional information regarding comorbidites inclusive of smoking status, cardiovascular disease, and diabetes mellitus (DM) were also evaluated. *Current Procedural Terminology* (CPT) codes were used to define our patient cohorts. The following codes were queried: implant-based reconstructions including direct to implant (19340) and tissue expander placement (19357). Autologous reconstructions were included by querying for a latissimus dorsi flap (19361) with and without placement of implant, the free transverse rectus abdominis myocutaneous (19364), and the pedicled transverse rectus abdominis myocutaneous (including microsurgical super charging; 19367, 19368, 19369). Immediate reconstruction was defined by concurrent mastectomy and reconstruction during the initial hospitalization. The CPT codes for mastectomy included simple mastectomy (19303), subcutaneous mastectomy (19304), radical mastectomy (19305 and 19306), and modified radical mastectomy (19307).

Patient encounters with CPT codes for mastectomy and reconstruction or solely for mastectomy alone were included. For the purposes of this study, patients undergoing a latissimus dorsi muscle flap with or without implant were included within the autologous cohort because the specific use of a muscle flap represented the more significant component of the reconstruction. Other patients with multiple different reconstructive modality CPT codes were excluded from the study. Any patient younger than 18 years was also excluded.

Data collection

According to the ACS Web site, ACS-NSQIP data is collected by trained research nurses at each institution using a systematic sampling of operations performed in each participating institution.[13] Results from audits completed to date reveal a disagreement rate of 1.8% for program variables. Each data set contains 240 Health Insurance Portability and Accountability Act compliant variables for each case encounter, including patient demographics, preoperative risk factors, baseline comorbidities, intraoperative variables, and 30-day postoperative morbidity and mortality. The list and definitions of variables collected in the database can be found at the ACS-NSQIP Web site.[13]

Patients are contacted by letter or telephone survey after discharge to ensure a full 30-day follow-up period. Data were accessed on October 1, 2014. Several end point outcomes variables were defined by combining defined ACS-NSQIP variables. We characterized a major surgical complication as a deep wound infection, graft or prosthetic loss, or an unplanned return to the operating room within