RESEARCH LETTER

Temporal Trends in and Factors Associated With Contralateral Prophylactic Mastectomy Among US Men With Breast Cancer

Previous studies have reported marked increases in the rates of contralateral prophylactic mastectomy (CPM) among US women who received a diagnosis of unilateral invasive breast cancer, and this increase is particularly evident among younger women.[1] Rates of CPM among women vary depending on the population studied, although national statistics show that the percentage of women with unilateral invasive breast cancer undergoing a CPM increased from approximately 2.2% in 1998 to 11% in 2011.[1] This increase has occurred despite the lack of evidence for a survival benefit from bilateral surgery, in addition to the complications and associated costs described in Los tumbo et al.[2] Factors that are thought to contribute to the increase in the rate of CPM include increased testing for *BRCA1/2* mutations, magnetic resonance imaging, and reconstruction surgery for symmetry, among others.[3] However, whether the CPM rate is also increasing among US men is unknown.[2] Herein, we used a nationwide population-based cancer database, the North American Association of Central Cancer Registries,[4] to examine the temporal trends in and the factors associated with CPM among men who received a diagnosis of unilateral invasive breast cancer.

Methods | After excluding patients who did not undergo surgery (n = 231) or whose type of surgery (n = 85), race/ethnicity (n = 72), insurance (n = 640), tumor grade (n = 328),

Table 1. Patient Characteristics by Treatment Type

Characteristic	Patients, No.	Patients, No. (%)			*P* Value
		Breast-Conserving Surgery	Unilateral Mastectomy	Bilateral Mastectomy	
Total No.	6332	1254 (19.8)	4800 (75.8)	278 (4.4)	
Age at diagnosis, y					
20-39	139	27 (19.4)	89 (64.0)	23 (16.5)	<.001
40-49	632	155 (24.5)	416 (65.8)	61 (9.7)	
50-59	1361	271 (19.9)	996 (73.2)	94 (6.9)	
60-69	1836	362 (19.7)	1408 (76.7)	66 (3.6)	
≥70	2364	439 (18.6)	1891 (80.0)	34 (1.4)	
P value for trend		.02	<.001	<.001	
Race/ethnicity					
Non-Hispanic white	5118	1005 (19.6)	3881 (75.8)	232 (4.5)	.01
Hispanic	333	85 (25.5)	230 (69.1)	18 (5.4)	
Non-Hispanic black	713	137 (19.2)	550 (77.1)	26 (3.6)	
Non-Hispanic other	168	27 (16.1)	139 (82.7)	DS[a]	
Year of diagnosis					
2004-2005	1166	250 (21.4)	881 (75.6)	35 (3.0)	<.001
2006-2007	1532	311 (20.3)	1171 (76.4)	50 (3.3)	
2008-2009	1750	309 (17.7)	1354 (77.4)	87 (4.9)	
2010-2011	1884	384 (20.4)	1394 (73.9)	106 (5.6)	
P value for trend		.31	.31	<.001	
Type of insurance					
Uninsured	149	24 (16.1)	120 (80.5)	DS[a]	<.001
Medicaid	219	46 (21.0)	165 (75.3)	8 (3.7)	
Medicare (<65 y)	264	41 (15.5)	209 (79.2)	14 (5.3)	
Medicare (≥65 y)	2667	509 (19.1)	2105 (78.9)	53 (1.9)	
Other	724	163 (22.5)	518 (71.5)	43 (5.9)	
Private	2309	471 (20.4)	1683 (72.9)	155 (6.7)	
AJCC stage					
I	2387	751 (31.5)	1521 (63.7)	115 (4.8)	<.001
II	2850	439 (15.4)	2285 (80.2)	126 (4.4)	
III	1095	64 (5.8)	994 (90.8)	37 (3.4)	

(continued)

Table 1. Patient Characteristics by Treatment Type (continued)

Characteristic	Patients, No.	Patients, No. (%)			*P* Value
		Breast-Conserving Surgery	Unilateral Mastectomy	Bilateral Mastectomy	
Histology					
Ductal	6757	1342 (19.9)	5132 (76.0)	283 (4.2)	<.001
Lobular or lobular component	158	73 (46.2)	76 (48.1)	9 (5.7)	
Other	560	148 (26.4)	391 (69.8)	21 (3.8)	
Tumor grade					
Well differentiated	1002	322 (32.1)	636 (63.5)	44 (4.4)	<.001
Moderately differentiated	3198	598 (18.7)	2487 (77.8)	113 (3.5)	
Poorly differentiated	2132	334 (15.7)	1677 (78.7)	121 (5.7)	
Tumor size, cm					
<2	3031	840 (27.7)	2046 (67.5)	145 (4.8)	<.001
2-4.9	2990	390 (13.0)	2485 (83.1)	115 (3.8)	
≥5	311	24 (7.7)	269 (86.5)	18 (5.8)	
Census region					
Northeast	1093	201 (18.4)	858 (78.5)	34 (3.1)	<.001
Midwest	844	99 (11.7)	706 (83.6)	39 (4.6)	
South	2718	685 (25.2)	1906 (70.1)	127 (4.7)	
West	1677	269 (16.0)	1330 (79.3)	78 (4.7)	

Abbreviations: AJCC, American Joint Committee on Cancer; DS, data suppressed owing to small cell number (ie, ≤6).

Table 2. Multivariate Logistic Regression for the Associations Between Bilateral Mastectomy and Unilateral Mastectomy or Breast-Conserving Surgery

Variable	AOR (95% CI)	*P* Value
Age at diagnosis, y		
20-39	15.3 (7.7-30.4)	<.001
40-49	7.7 (4.3-13.5)	<.001
50-59	5.3 (3.1-9.1)	<.001
60-69	2.6 (1.6-4.1)	<.001
≥70	1 [Reference]	
Race/ethnicity		
Non-Hispanic white	1 [Reference]	
Hispanic	0.9 (0.5-1.5)	.61
Non-Hispanic black	0.6 (0.4-0.9)	.03
Non-Hispanic other	0.2 (0.0-0.7)	.01
Year of diagnosis		
2004-2005	1 [Reference]	
2006-2007	1.1 (0.7-1.6)	.84
2008-2009	1.7 (1.1-2.6)	.01
2010-2011	1.9 (1.3-2.9)	.001
Type of insurance		
Uninsured	0.4 (0.2-1.1)	.07
Medicaid	0.5 (0.2-1.0)	.06
Medicare (<65 y)	0.9 (0.5-1.5)	.60
Medicare (≥65 y)	0.9 (0.6-1.4)	.69
Other	1.0 (0.7-1.4)	.77
Private	1 [Reference]	
Histology group		
Ductal	1 [Reference]	
Lobular	1.7 (0.9-3.5)	.13
Other	1.0 (0.6-1.7)	.88
AJCC stage		
I	1 [Reference]	
II	1.0 (0.7-1.4)	.79
III	0.6 (0.4-1.0)	.07
Tumor grade		
Well differentiated	1 [Reference]	
Moderately differentiated	0.9 (0.6-1.3)	.47
Poorly differentiated	1.4 (1.0-2.0)	.09
Tumor size, cm		
<2	1 [Reference]	
2-4.9	0.8 (0.6-1.2)	.29
≥5	1.5 (0.8-2.7)	.21

Abbreviations: AJCC, American Joint Committee on Cancer; AOR, adjusted odds ratio.

or tumor size (n = 10) was unknown, we identified 6332 men 20 years of age or older with American Joint Committee on Cancer stage I to III unilateral breast cancer who underwent surgery during the period from 2004 to 2011. Temporal trends in the use of surgery (CPM, mastectomy, or breast-conserving surgery) were evaluated using the Cochran-Armitage trend test. Multivariate logistic regression was used to examine demographic and clinical factors associated with CPM. Our study was deemed exempt research by the institutional review board of the North American Association of Central Cancer Registries located in Springfield, Illinois.

Results | During the period from 2004 to 2011, of 6332 men undergoing surgery, 1254 (19.8%) underwent breast-conserving surgery, 4800 (75.8%) had a mastectomy, and 278 (4.4%) underwent a bilateral mastectomy (**Table 1**). Between 2004-2005 and 2010-2011, the rates of CPM among men who underwent surgery increased by 86.7%, from 3.0% to 5.6%

($P < .001$). The rate monotonically decreased with age, from 16.5% for men 20 to 39 years of age to 6.9% for men 50 to 59 years of age to 1.4% for men 70 years of age or older ($P < .001$). The factors associated with a higher likelihood of CPM included younger age (eg, 20-39 years vs ≥70 years, with an adjusted odds ratio of 15.3 [95% CI, 7.7-30.4]), white race (blacks vs whites, with an adjusted odds ratio of 0.6 [95% CI, 0.4-0.9]), and private insurance (Medicaid vs private insurance, with an adjusted odds ratio of 0.5 [95% CI, 0.2-1.0]) (**Table 2**).

Discussion | We report, for the first time to our knowledge, that the use of CPM for men who received a diagnosis of unilateral breast cancer has substantially increased over time in the United States, with the procedure more common in younger, white, and privately insured patients. The reasons for these changing patterns are unknown, although similar factors are also associated with the use of CPM for women with breast cancer. In addition, the use of CPM for women has been shown to be associated with the use of genetic testing and magnetic resonance imaging during diagnosis,[5] which have increased over the past decade. However, it is unknown whether the use of CPM for men is associated with genetic testing, family history, magnetic resonance imaging, or fear of contralateral breast cancer (contralateral breast cancers are more common in men than women), and we do not have these variables in our analytical database to examine their associations with use of CPM.

Ironically, the increase in the rate of CPM, a costly procedure without a survival benefit, is unfolding in the face of a greater emphasis on value in cancer care.[6] Health care professionals should be aware that the trends in CPM are not limited to women alone, and clinicians should educate male patients about the existing evidence of the benefit, harm, and cost of CPM in order to help patients make informed decisions about their treatments.

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Negative Finding From Computed Tomography of the Abdomen After Blunt Trauma

Despite the focus on time management, cost-efficient health management, resource utilization, and the growing evidence regarding the long-term effects of radiation exposure, the liberal use of computed tomography (CT) for trauma remains common. Determining which patients require CT imaging and what percentage of negative CT findings is an acceptable counterpart to potential missed cases of occult injury is a topic of significant debate.[1,2] The use of negative CT findings after trauma as a trigger for early hospital discharge has been shown to decrease hospital costs.[3] In the current era, however, a missed injury after trauma is often regarded as a "never event." Although CT imaging has become a highly reliable adjunct to a physical examination after trauma, concern remains regarding its sensitivity and specificity in detecting hollow viscus injury.[4,5] Despite the growing number of patients with negative CT findings, it remains unclear at what point it is safe to clear these patients for hospital discharge. Given the sensitivity of physical examinations for posttraumatic intra-abdominal injury and of CT scans for solid organ injury, we hypothesized that a negative CT finding for an asymptomatic patient after blunt abdominal trauma is sufficient to exclude major intra-abdominal injury.

Methods | All blunt trauma patients admitted in 2013 who underwent CT of the chest, abdomen, and pelvis on admission were evaluated, and those who underwent CT of the abdomen and pelvis and had negative findings formed the study group. A negative CT finding was defined as a CT scan revealing no abnormalities aside from incidental findings noted on the final report. All images were read by an attending radiologist. During this period, all patients with a mechanism sufficient to trigger a CT scan were observed after imaging to evaluate for delayed injury.

Patients' demographics, injuries, results of physical examinations, external signs of trauma, and durations of observation were recorded. The primary outcome was a delayed injury diagnosis.