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Review

Increasing trend of contralateral prophylactic mastectomy: What are the factors behind this phenomenon?



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ABSTRACT

Introduction: Numerous studies have shown a trend towards increasing rates of contralateral prophylactic mastectomy (CPM) in the US. In this review, we will explore the trend, possible causative factors and outcomes from CPM.

Methods: We performed a literature review of all relevant retrospective reviews, clinical trials and review articles regarding contralateral prophylactic mastectomy.

Results: Several studies have noted a four to fivefold increase in CPM in recent years; an increase most notable in younger patients. When surveyed, patients report that the most important factors affecting their choice of CPM include fear of cancer recurrence, genetic counseling/testing, family history or additional high risk factors, stress surrounding close follow up, the availability of reconstructive surgery and information provided about contralateral breast cancer (CBC) risk and risk for local recurrence. Women who have undergone CPM do report high satisfaction with the procedure and some studies suggest risk reduction.

Conclusion: CPM rates have increased across the US and numerous factors have been reported to increase the likelihood of choosing CPM. Despite that bilateral mastectomy is associated with an increased risk of wound and overall postoperative complications for certain populations, this surgery appears to have psychological, cosmetic and possibly oncologic benefit.

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Introduction

As of 2013, breast cancer (BC) remains the most common non-cutaneous malignancy in US women and the second

leading cause of cancer mortality.¹ Surgical therapy for breast cancer has evolved and many women have the choice between breast conservation and mastectomy. It is commonly reported in the literature that many women choose mastectomy, despite the ability to undergo breast

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Table 1 – Predictors of contralateral prophylactic mastectomy.

	Tuttle n = 51, 030	Yao n = 1,166,456	Yi n = 2, 504	Bedrosian n = 107,106	Sorbero n = 3,606	Brewster n = 3889	Arrington n = 571
CPM Rate ^b	7.7%	1.99%	11.3%	8.3%	5.3%	13.7%	28.9%
Predictors (OR)							
Young ^a Age	2.15–8.06*		1.84		10.88*	* 57.9%	
White Race	0.39–0.45*	0.452–0.636	2.63*	1.01–1.44*			
Positive Family History			1.58*		1.19*		1.37
BRCA Testing			5.16*				
Invasive Ca ^c	0.48–0.91*	0.536–0.703*	1.82*	8.97–74.49*	0.6–1.52		
Invasive Lobular Histology	1.38*	5.6*	1.58*	0.86			3.53*
MRI performed					2.04*		1.23
ER/PR Negative	1.02			2.36		*0.6	
cN0		0.610–0.946					0.53

*p value considered significant when <0.05.
 CPM: Contralateral prophylactic mastectomy.
 ER: Estrogen receptor.
 PR: Progesterone receptor.
 MRI: Magnetic resonance Imaging, cN0: Clinically node negative.
^a Young definition varies of ages from 30 to 70 in different studies.
^b CPM/Total breast cancer surgeries in study period.
^c vs. in situ carcinoma OR: Odds ratio.

conservation, for a number of personal, education and oncologic reasons.

The local therapy options for female BC have evolved, with as many as two thirds of eligible patients choosing breast conserving surgery at the height of its popularity. Many patients with the option to preserve the breast choose mastectomy for reasons other than oncologic safety. Multiple studies have demonstrated an increase in mastectomy rates in the last decade.^{2–5} While the use of mastectomy for the treatment of BC appears to be on the rise, so is the application of CPM as a risk reduction measure.^{2,3}

Studies both support and refute the hypothesis of CPM leading to improved survival but the performance of CPM can reduce the risk of developing a contralateral breast cancer (CBC) by more than 90%, and this level of risk reduction cannot be approached by current chemoprevention methods, making prophylactic surgery attractive to those patients who are at particularly high risk of developing contralateral disease.^{6–10} This review attempts to address several issues relative to CPM, including the rate of increase of CPM, reasons why women would choose this method of risk reduction, the degree of benefit from CPM, and available alternatives.

Increasing rate of CPM

According to Surveillance, Epidemiology, and End Results (SEER) data, an increasing rate of mastectomy procedures (including CPM) has been reported since 1998.^{2,3} CPM rates of those patients with a unilateral BC increased from 1.9% to 4.5% during a 10-year period.³ In their population-based study, Habermann et al. found that despite decreasing unilateral mastectomy rates, CPM rates have increased for the youngest patients in the US from 2000 to 2006.¹¹ In several studies, CPM rates range from 4.7% to 55.9%^{2,3,6,7,11,13} (Table 1). Tuttle et al.

reported their CPM rate was 4.1% amongst of all patients undergoing breast cancer surgery and 13.5% in patients undergoing mastectomy.² Our institution reported in a study by Sorbero et al. that both mastectomy and CPM rates increased from 28% to 30% and from 4.1% to 6.4%, respectively, during an eight year period ($p = 0.18$ and $p = 0.002$).¹³ The rate of CPM in comparison to unilateral mastectomy is slightly increasing over time, as evidenced by updated data from our institution. This demonstrated that, while breast conserving surgery rates decreased from 74% to 62%, mastectomy rates increased from 26% to 38% and the CPM plus mastectomy rates increased from 22% to 26% among the mastectomy patients in the last decade [unpublished data].

Factors affecting CPM

The explanation of the increasing rate of CPM appears to be multifactorial, with a number of patient, institution, and environmental reasons influencing patient decisions. According to the results of numerous studies, developing BC at a young age (<50), increasing tumor size, higher tumor stage, white race, family history, undergoing genetic testing (BRCA1/2) before surgery, use of hormone replacement therapy, magnetic resonance imaging (MRI) use for preoperative diagnosis, positive lymph node status, year of diagnosis, multicentric disease, ductal carcinoma in situ [DCIS], lobular carcinoma in situ [LCIS], and the availability of reconstructive surgery were factors affecting the decision for CPM.^{2,3,5,7,11,12–15} Other noted predictors of CPM include regional factors, marital status, insurance status, socioeconomic advantages, higher education and surgeon gender¹¹ (Table 2).

Recent management changes and treatment options for patients with BC may affect the CPM rate. Genetic counseling

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