Factors influencing a woman's decision for breast conservation vs. mastectomy with contralateral prophylactic mastectomy in early-stage, hormone-sensitive, breast cancer: A systematic review

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Abstract:

Research Question:

What factors influence a woman's decision for breast conservation vs mastectomy and contralateral prophylactic mastectomy in early-stage, hormone-sensitive, breast cancer?

Introduction and Significance:

Breast conservation (BC) is a viable option for many patients diagnosed with early-stage breast cancer. With proper medical management and radiation, there is no difference in overall survival (OS) between BC and mastectomy in patients who lack genetic mutations. While this data is well-established, women are opting for mastectomy with contralateral prophylactic mastectomy (CPM) at increasing rates. A better understanding of factors influencing a patient's desire for mastectomy and CPM can honor the approach of shared decision making and autonomy, while potentially leading to less invasive surgical intervention. We completed a systematic review of both quantitative and qualitative studies exploring factors impacting patient decision making for mastectomy and contralateral prophylactic mastectomy vs breast conservation surgery in patients with early state breast cancer.

Materials and Methods:

Studies were identified via database searches of Cochrane, Embase, and PubMed. Articles of interest were identified and then selected based on inclusion and exclusion criteria. Data was then extracted by one author using a standardized criterion and analyzed. Quality was assessed using standardized criteria through Covidence.

Results:

366 citations were reviewed with 68 meeting the specified inclusion criteria. Analysis showed that factors most influential for CPM included anxiety (45%), lack of knowledge regarding their

cancer (43%), lack of understanding regarding future cancer risk (44%), and the desire to extend/prolong life while avoiding future treatment (35%). Surgeon preference (35%) and a desire for symmetry (31%) also were important factors when choosing CPM.

Conclusions:

While patients are satisfied with their decision to undergo the more invasive treatment option of mastectomy with CPM, patients will benefit from education techniques that target the risks and benefits and address the common misconceptions surrounding both surgical options for breast cancer. This approach honors both patient autonomy and shared decision making, while staying true to the basic principle of "do no harm." Understanding specific factors influencing the patient decision making process can help ensure patients receive an individualized approach to their cancer care.

Research Question:

What factors influence a woman's decision for breast conservation vs mastectomy and contralateral prophylactic mastectomy in early-stage, hormone-sensitive, breast cancer?

Hypothesis:

The personal decision between breast conservation and mastectomy with contralateral prophylactic mastectomy is complex and depends on numerous factors. Factors such as anxiety, perceived survival benefit, and symmetry likely all play into the decision-making process.

Aims:

To better understand the factors driving patient decision-making surrounding the personal choice of breast conservation vs mastectomy with contralateral prophylactic mastectomy. To differentiate between the quantitative and qualitative factors surrounding patient decision-making when opting for contralateral prophylactic mastectomy.

Introduction and Significance:

Impacting 1 in 8 women, breast cancer is the most common female malignancy. Since the utilization of the Radical Mastectomy in 1894, surgical therapy has evolved dramatically.[1] Sparing of the pectoral muscles, forgoing axillary dissection for sentinel lymph node biopsies, and the advancement of adjuvant medical and radiotherapies have allowed for a "less is more" approach to cancer care.[1] In modern times, women with early-stage, hormone-sensitive (HR+), non-hereditary breast cancer are often presented with multiple surgical options when it comes to their cancer treatment. The two pathways, breast conserving therapy (BCT) and mastectomy, each offer their own risks and benefits. Allowing for less surgery, BCT is an appropriate option for women with isolated, HR+, early-stage breast cancer. Often accompanied by adjuvant endocrine and radiotherapies, BCT offers equal survival outcomes compared to mastectomy as shown in the NSABP B-06 trial.[2]

The decision to undergo a mastectomy is complicated by factors such as reconstruction and symmetry. Therefore, when considering mastectomy, the option for contralateral prophylactic mastectomy (CPM) is typically presented. More often, women who opt for mastectomy elect to have a CPM of the opposite, healthy breast, with or without reconstruction, despite increased surgery, recovery time, and no true survival benefit. [3] While genetic mutations, family history, age at diagnosis, hormone receptor status, and adjuvant endocrine therapy all factor into the risk of developing a secondary breast cancer, many patients who fall outside these parameters still opt for CPM. The American Society of Breast Surgeons (ASBrS) discourages the use of CPM in average-risk women with unilateral breast cancer and encourages surgeons to directly recommend for or against CPM when advising patients. The 2016 consensus statement highlights that most women diagnosed with breast cancer receive no oncologic benefit from

undergoing a CPM. The statement cites CPM as an ineffective cost-saving method when considering the continued yearly surveillance required for BCT patients. Additionally, the psychosocial impacts of CPM on patients are cited in the consensus with 20-30% of women citing dissatisfaction regarding cosmesis, body image, and sexuality.[3] However, conflicting data exists regarding these numbers as other studies report equal satisfaction in women who undergo CPM.[4]

While quantitative data is abundant when it comes to survival benefit and outcomes in BCT vs mastectomy with CPM patients, qualitative data is lacking despite the decision being largely personal in nature. When making the decision to undergo CPM, women must consider factors such as breast symmetry, the loss of breast sensation, and anxiety caused by keeping their once-diseased breast. Therefore, understanding qualitative reasons behind CPM is just as important as examining the data behind the risks and benefits. If surgeons can appreciate the thought process behind CPM from a patient perspective, and properly address these factors during surgical consultations, then rates of CPM and unnecessary interventions might be decreased. To address the complexities surrounding a patient's decision for BCT vs mastectomy and CPM in early stage, hormone receptor positive breast cancer, both the qualitative and quantitative factors surrounding a patient's choice were evaluated via systematic review.

Methods:

A search of literature was conducted using the databases Cochrane, Embase, and PubMed. Search criteria included terms such as breast neoplasm, breast cancer, breast tumor, decision making, patient education as topic, patient participation, patient education, patient participation, and decision making, shared (Tables 1, 2 and 3). Inclusion criteria included women with early-stage breast cancer. Breast conservation surgery vs mastectomy and contralateral prophylactic mastectomy had to be considered. Exclusion criteria included women without breast cancer, women with a genetic mutation, women with a stage III or stage IV breast cancer, women undergoing bilateral risk-reducing mastectomy, papers published outside of the United States, and papers published prior to 2015. Decisions regarding selection were made by one author. Unfortunately, due to resource constraints, verification by an additional author(s) was not attainable. Covidence was utilized to aid in data extraction assessing for a focused clinical question, reproducible selection of studies, risk of bias, precision of results, overall quality, patient population, clinically applicable results, and factors influencing patient choice for prophylactic mastectomy. Factors included: surgeon preference, age, adjuvant treatment influences, anxiety, lack of knowledge and/or understanding, symmetry, family/friends/social influences, age, extending life, preventing recurrence/decreasing risk, and other.

Table 1:

Embase	
Search Number	**Query**
9.	#5 AND #8
8.	#6 OR #7
7.	decision making OR patient education OR decision aid OR patient participation
6.	decision making OR patient education as a topic OR patient participation OR decision making, shared
5.	#3 AND #4
4.	#1 OR #2
3.	surger* OR surgical procedure OR operative procedure
2.	breast neoplasm OR breast cancer OR breast tumor OR mammary cancer OR breast carcinoma
1.	breast tumor

Table 2:

Cochrane	
Search Number	**Query**
9.	#5 AND #8
8.	#6 OR #7
7.	decision making OR patient education OR decision NEXT aid OR patient participation
6.	decision making OR patient education as a topic OR patient participation OR decision making, shared
5.	#3 AND #4
4.	#1 OR #2
3.	surger* OR surgical NEXT procedure OR operative NEXT procedure
2.	Breast NEXT neoplasm OR breast NEXT cancer OR breast NEXT tumor OR mammary NEXT cancer OR breast NEXT carcinoma
1.	breast neoplasms

Table 3:

PubMed	
Search Number	**Query**
9.	#5 AND #8
8.	#6 OR #7
7.	decision making [Title/Abstract] OR patient education [Title/Abstract] OR decision aid [Title/Abstract] OR patient participation [Title/Abstract]
6.	decision making [MeSH Terms] OR decision making [All Fields] OR patient education as a topic [MeSH Terms] OR patient participation [MeSH Terms] OR decision making, shared [MeSH Terms]
5.	#1 OR #4
4.	#2 AND #3
3.	surger* [Title/Abstract] OR surgical procedure [Title/Abstract] OR operative procedure [Title/Abstract]
2.	breast neoplasm [Title/Abstract] OR breast cancer [Title/Abstract] OR breast tumor [Title/Abstract] OR mammary cancer [Title/Abstract] OR breast carcinoma [Title/Abstract]
1.	breast neoplasms/surgery [MeSH Terms]

Results:

The search strategy yielded 805 citations and 366 texts were selected for review based on their title and abstract. Of the 366 texts, 68 met inclusion criteria (all included articles with citations are provided following the references). Findings were organized by factors influencing reasons to undergo contralateral prophylactic mastectomy as reported in methods (Figure 1).

Anxiety

Anxiety played a large role in patient decision-making surrounding CPM. 45% of articles cited anxiety as a major surgical influence.

Extending life

The desire to extend life motivated patients to forego BCT and pursue a mastectomy and CPM to manage their cancer care. 35% of the reviewed studies citied this factor as an influence for more the more invasive surgical approach.

Lack of Knowledge Regarding Treatment Approaches

A lack of understanding regarding breast cancer care influenced a patient's decision for mastectomy and CPM in 43% of reviewed studies.

Exaggerated recurrence risk perception

In 44% of reviewed literature, an exaggerated perception regarding risk of cancer recurrence and a desire to avoid recurrence in the ipsilateral breast, and a new cancer in the contralateral breast, motivated patients to pursue mastectomy and CPM.

Surgeon Preference

Surgeon preference was cited as a decision factor in 35% of studies.

Societal Influence

Societal influence from friends, family, and social media was cited as an influencing factor for mastectomy and CPM in 7% of the reviewed studies.

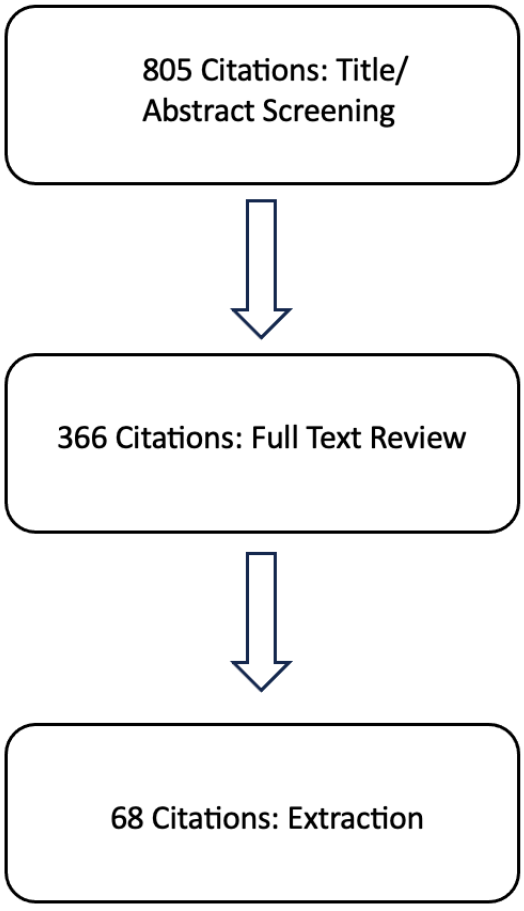
Symmetry

Breast symmetry influenced a patient's decision for mastectomy and CPM in 31% of the reviewed studies.

Other Factors

The desire to avoid further treatment, such as adjuvant endocrine therapy or radiation therapy, was a driving influence for mastectomy and CPM in 10% of the reviewed studies. Age was cited as a deciding factor in 20% of the reviewed literature.

Figure 1: Review Process and Article Determination



Discussion:

This study examined the factors influencing a woman's choice for mastectomy and CPM. Our study found that anxiety, desire to extend life, lack of knowledge regarding treatment approaches, and an exaggerated risk of recurrence perception were the most cited surgical decision-making factors for patients. Surgeon preference, a desire for breast symmetry, and age, were also large factors for patients when deciding their surgical approach. These findings suggest that the decision for BCT vs mastectomy and CPM is complex but is often driven by fear and lack of understanding regarding the overall survival benefit associated with more invasive surgical management. Surgeon preference was listed as a deciding factor in 35% of the reviewed literature, which shows patients may be open to physician input. Importantly, the theme of inadequate knowledge surrounding their breast cancer diagnosis and treatment process, provides an avenue to surgeons to inform patients and participate in meaningful shared decision-making.

As treatment modalities evolve over time, patients with early-stage breast cancer now have multiple surgical options. Surgeons are often the first healthcare professional to meet with patients after their breast cancer diagnosis to coordinate their overall treatment process. Due to this exposure, surgeons have the unique opportunity to inform, and direct, their patients both from a surgical and medical therapy standpoint. As demonstrated in The What Matters Most trial, breast cancer patients respond favorably to shared decision making.[5] However, while BCT is the recommended modality of treatment for the majority of early-stage, non-hereditary breast cancers among surgeons, mastectomies and CPM are still frequently performed.[6] While Onitilo et al. demonstrated no difference in survival for BCT vs mastectomy patients, which has continued to guide surgeon recommendations, a more recent analysis by Lazow et al. suggested a small, but significant benefit in patients undergoing BCT or mastectomy with CPM versus

unilateral mastectomy alone.[6,7] Regardless, the general consensus that BCT is more favorable to mastectomy with CPM stems from less invasive surgical management, preservation of the patient's native anatomy, and preservation of sensation among many reasons.

While 35%-44% of the reviewed literature cited lack of understanding, greater perceived risk for recurrence, and perceived improved survival benefit as reasons to undergo mastectomy with CPM, one prospective study (n=125) cited a preference for mastectomy even after adequate education with decision aids and surgical consultation.[8] Additionally, anxiety was cited as the most common reason to undergo mastectomy with CPM, but this is difficult to measure consistently as all patients will have some level of anxiety at their diagnosis. One study of 203 patients reported that younger patients with higher measured anxiety were more likely to undergo mastectomy and CPM than those with less anxiety.[9] Additionally, Rosenberg et al. highlighted the preferences of young women with early-stage breast cancer. Two-thirds of those who characterized their consultation as "self-driven" opted for a CPM whereas those who reported the decision was physician-driven underwent CPM significantly less (6%).[10,11] However, when patients felt shared decision-making was achieved during their consultation, nearly equal rates of BCT, mastectomy, and mastectomy with CPM were noted.[10,11]

Future Directions:

One of the limitations of this study was the use of one screener for a systematic review. While unavoidable in this situation, the utilization of multiple reviewers is ideal for appropriately appraising literature. This review encompassed the years 2015-present time, which is appropriate given frequent advances and recommendations in breast surgical oncology. However, the decision of BCT vs mastectomy and CPM has existed long before 2015 and a review encompassing a larger data set could be beneficial. Further studies should consider how patient autonomy, and the right to choose their own treatment path, can be honored with best conveying surgeon recommendation for BCT. Physicians practice with the principle "do no harm" and the removal of a completely healthy breast, with no true benefit in patient outcome, goes against this standard. Future studies should focus on the balance of a patient's right to bodily autonomy with unnecessary medical intervention. Additionally, there seems to be a lack of understanding surrounding the true benefits of mastectomy and CPM among early-stage breast cancer patients. Future studies should examine ways in which patients are educated on the risks and benefits of both surgical options prior to consulting with a surgeon.

Conclusion:

While patients frequently cite reasons such as fear of recurrence, improved survival, anxiety over undergoing a second cancer diagnosis, and symmetry as reasons for mastectomy and mastectomy with CPM vs BCT, many patients still elect for more invasive surgery after proper education. ASBrS encourages surgeons to clearly state the benefits of BCT vs mastectomy with CPM to patients during the surgical consultation and to advocate for the less invasive surgical options. However, honoring patient autonomy and shared decision-making calls for thoroughly explaining both approaches to patients. Patients will benefit from education focused on the risks and benefits of both surgical options while addressing the common misconceptions that lead patients to undergo more invasive treatment methods.

Compliance:

No IRB was necessary for this study.

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