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Research Article

Contralateral Prophylactic Mastectomy in Unilateral Breast Cancer: Histopathological Yield and Patient Reported Outcomes from a Single Institution Experience

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Abstract

Objective: Despite advances in early detection and treatment, patients with unilateral breast cancer remain at risk for developing contralateral breast malignancy. Contralateral Prophylactic Mastectomy (CPM) is often pursued as a risk-reducing option in high-risk individuals. This study presents a single-institution experience with CPM by evaluating clinical profiles, histopathological findings and Patient Reported Outcome Measures (PROMs).

Methods: This retrospective-prospective study was conducted at the Breast Surgery Department, Liaquat National Hospital, from January 2018 to December 2024. Clinical and pathological data were reviewed for patients who underwent CPM. PROMs, including the Decision Regret Scale (DRS), Personal Well-being Index (PWI) and Body Image Scale (BIS), were assessed via structured phone interviews. A DRS ≤25 indicated mild regret, PWI ≥70 denoted normal well-being and BIS ≤14 indicated a positive body image.

Results: Among 22 patients (mean age: 43.9 ± 11.2 years), 13 (59.1%) had a positive family history and 19 (86.3%) underwent genetic testing. BRCA1, BRCA2 and TP53 mutations were detected in 13 (59.1%), 3 (13.6%) and 2 (9.1%) cases, respectively and 1 (4.5%) patient was BRCA1/2 negative. Histopathology of CPM specimens revealed stromal fibrosis in 13 (59.1%), adenosis in 5 (22.7%), dilated ducts in 3 (13.6%) and benign tissue without abnormality in 6 (27.3%) cases. PROMs from 19 patients showed mild or no regret in 16 (84.2%), normal well-being in 15 (78.9%) and a positive body image in 17 (89.5%) patients. Moderate fear of recurrence was reported by 13 (40.9%) patients.

Conclusion: CPM in this cohort was largely associated with benign histological findings. PROMs indicate overall psychological acceptance, though recurrence anxiety remains. These findings highlight the importance of individualized counseling in decision-making for CPM.

Keywords: Contralateral Prophylactic Mastectomy; Unilateral Breast Cancer; BRCA; Histopathology; Patient-Reported Outcomes; Decision Regret

Introduction

Breast cancer is the most frequently diagnosed malignancy in women worldwide and contributes significantly to cancer-related morbidity and mortality. Despite improved survival due to early detection and advancements in treatment, patients diagnosed with unilateral breast cancer remain susceptible to Contralateral Breast Cancer (CBC). This risk is especially pronounced in women carrying BRCA1, BRCA2 or TP53 mutations or those with a strong family history [1,2].

Contralateral Prophylactic Mastectomy (CPM) is increasingly employed as a preventive strategy, particularly among genetically high-risk individuals. Although CPM significantly reduces the incidence of CBC, its appropriateness in average-risk patients remains contentious. Studies have reported that many CPM specimens show no evidence of malignancy, raising concerns about

overtreatment [3,4]. In parallel, the psychological and quality-of-life outcomes following CPM have become areas of active inquiry [5].

The decision to undergo CPM is multifactorial, often driven by genetic risk, family history, prior cancer experiences and psychosocial elements such as body image and recurrence anxiety. Patient-Reported Outcome Measures (PROMs) provide valuable insight into postoperative satisfaction, well-being and regret [6].

This study aims to present the institutional experience with CPM by examining the clinical and genetic profiles, histopathological outcomes and psychological impacts in patients with unilateral breast cancer. Our findings seek to inform clinical decision-making and highlight the role of comprehensive counseling.

Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore, was exempt.

Materials and Methods

Study Design and Setting

A retrospective-prospective study was conducted at the Breast Surgery Department of Liaquat National Hospital from January 2018 to December 2024. Ethical approval was obtained and all prospective participants provided informed consent.

Patient Selection

Patients aged ≥18 years with histologically confirmed unilateral breast cancer who underwent contralateral prophylactic mastectomy were included. Exclusion criteria included metastatic disease, incomplete records or unavailability for PROM interviews.

Data Collection

- Retrospective: Clinical data, family history, genetic testing (BRCA1/2, TP53) and histopathological findings were extracted from records
- Prospective: PROMs were collected via phone using validated tools:
  - Decision Regret Scale (DRS): Scores 0–100; ≤25 considered mild regret
  - Personal Well-being Index (PWI): Score range 0–1000; ≥70 indicates normal well-being
  - Body Image Scale (BIS): Score range 10–30; ≤14 indicates no significant body image disturbance

Statistical Analysis

Data were analyzed using IBM SPSS v27. Descriptive statistics summarized patient profiles and PROM outcomes. Continuous variables were reported as means ± SD; categorical variables as frequencies and percentages.

Results

Of the 22 patients included, the mean age was 43.95 ± 11.16 years (range 25-63). Thirteen (59.1%) had a positive family history. Four patients (18.2%) opted for prophylactic mastectomy based solely on personal preference. Nineteen patients (86.3%) underwent genetic testing that showed BRCA1 positive in 13 (59.1%) patients, BRCA2 positive in 3 (13.6%), TP53 positive in 2 (9.1%) and BRCA1/2 negative in 1 (4.5%) patient. Histopathological analysis of CPM specimens revealed stromal fibrosis in 13 (59.1%) cases, adenosis in 5 (22.7%), dilated ducts in 3 (13.6%) and entirely benign tissue in 6 (27.3%) cases. Genetic Testing and Histopathology results shown in Table 1.

Category	Finding	Count	%
Genetic	BRCA1 positive	13	59.1
	BRCA2 positive	3	13.6
	TP53 positive	2	9.1
	BRCA 1/2 negative	1	4.5
	Not tested	3	13.6
Histopathology	Stromal fibrosis	13	59.1
	Adenosis	5	22.7
	Dilated ducts	3	13.6
	No evidence of malignancy	6	27.3

Table 1: Genetic testing and histopathology findings.

Patient-Reported Outcomes (PROMs) were assessed in 19 surviving patients (Table 2). Sixteen out of nineteen (84.2%) patients had mild or no regret, mean DRS was 12.27 ± 11.1. Fifteen out of nineteen (78.9%) patients had normal well-being, mean PWI was 759.5 ± 340.7. Seventeen out of nineteen (89.5%) patients had positive body image, mean BIS was 13.7 ± 5.7. Fear of recurrence was reported as moderate to severe in 13 (40.9%) patients.

PROM	Score Category	Count	%
DRS	≤25	16	84.2
	>25	3	15.8
PWI	≥70	15	78.9
	<70	4	21.1
BIS	≤14	17	89.5
	>14	2	10.5

Table 2: PROMs summary.

Discussion

Our study supports earlier findings that most CPM specimens in unilateral breast cancer patients do not reveal occult malignancy. The predominance of benign histopathology underscores the need for careful patient selection, particularly among those without a confirmed genetic predisposition [3,4].

High rates of BRCA1 mutation and family history were major drivers of CPM decisions in our cohort. These findings align with published literature advocating for CPM in genetically predisposed individuals [2,10]. In contrast, patients without identifiable mutations are less likely to benefit from CPM and in such cases, heightened anxiety may be a stronger motivator than objective clinical risk [5,6].

Psychologically, the majority of patients reported favorable outcomes in terms of well-being, body image and decision satisfaction. Similar outcomes were demonstrated by Rosenberg, et al., where most patients experienced no regret and good quality of life following prophylactic surgery [11]. However, our study also indicates that anxiety surrounding cancer recurrence remains prevalent. This highlights the paradox that despite surgical elimination of risk, fear may persist, reinforcing the importance of preoperative psychological support.

Importantly, shared decision-making and personalized risk communication have been associated with improved satisfaction and reduced decisional regret [12]. Montgomery, et al., emphasize that preoperative counseling should include not only risk-benefit discussions but also psychological readiness and expectations [13]. Sociocultural factors also shape patient attitudes toward mastectomy, underscoring the need for culturally sensitive counseling approaches. Despite these insights, the study has limitations, including a small sample size, single-institution design and potential recall bias due to retrospective PROM collection. Future studies should consider multicenter prospective designs with longer follow-up to assess oncological and psychological outcomes over time.

Conclusion

While CPM may offer oncological benefit for high-risk patients, its clinical justification in average-risk women is debatable given the absence of malignancy in most contralateral specimens. Patient satisfaction remains high, but anxiety regarding recurrence persists. Personalized risk counseling and shared decision-making are essential to support women in making informed, confident choices.

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Author's Contribution

All authors read and approved the final manuscript.

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