

ROLE OF SITE-SPECIFIC MULTIDISCIPLINARY TEAM MANAGEMENT IN BREAST CANCER PATIENTS

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Keywords

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Abstract

Background: Multidisciplinary team (MDT) management improves cancer outcomes but adoption remains limited in developing countries. Failure to adopt standard management protocols contributes to delays in breast cancer diagnosis and treatment. This study compares site-specific MDT versus conventional management approaches.

Objective: To evaluate site-specific Breast MDT effectiveness in reducing diagnostic and treatment delays in breast cancer patients.

Study Design: Comparative cohort study.

Study Setting: This study was conducted at the Department of Breast Surgery, Madina Teaching Hospital (MTH), Faisalabad

Study Duration: Six Months (October '24, to March '25).

Methodology: Comparative cohort study of 258 breast cancer patients that included 154 MDT-managed and 104 conventionally managed. Primary outcomes were time from presentation to diagnosis, diagnosis to surgery, and diagnosis to chemotherapy. Data was analyzed using IBM SPSS Statistics version 26.0. Independent t-test was used for continuous variables and chi-square tests for categorical variables ($p < 0.05$ significant).

Results: Mean age of study population in MDT group was 48.34 ± 10.25 and in non-MDT group was 50.39 ± 7.23 years. Among biological subtypes, HER2+ disease was 38.9% in MDT vs 83.7% in non-MDT group ($p < 0.001$). Diagnostic work up was completed in 1 month in MDT group & 2 month in non MDT group ($p < 0.001$). Chemotherapy initiated 3.1 months (MDT) versus 6.3 months (non-MDT) ($p < 0.001$)—95-day advantage representing 50.5% reduction.

Conclusion: Site-specific MDT based management of breast cancer improved timely diagnosis and treatment of breast cancer patients and thus it led to better patient outcome and trust on managing team and institute.

Keywords: MDT, Breast Cancer, Breast surgery, Cancer diagnosis, Chemotherapy.

INTRODUCTION

A multidisciplinary team (MDT) in healthcare refers to a coordinated group of specialists from diverse fields who manage patient care through integrated decision-making. It has proven instrumental in ensuring comprehensive, patient-centered, and evidence-based management.¹ Studies have demonstrated that MDT-led management reduces diagnostic delays, optimizes treatment sequencing, and improves both clinical outcomes and patient satisfaction².

Recent advancements in oncology have led to a paradigm shift in the management of cancer patients, moving to a more holistic view of oncological diseases³. This shift is driven by the recognition of cancer as a complex, multifaceted pathology rather than merely a local disease. Furthermore, the enhanced life expectancy of cancer patients has redirected the focus of healthcare professionals towards not only extending survival life, but also improving the quality of life⁴.

Breast cancer, the most prevalent malignancy among women globally, remains a leading cause of cancer-related mortality. According to GLOBOCAN 2020, breast cancer accounts for approximately 24% of all female cancers, representing a major global health challenge⁵. In Pakistan, the burden is particularly alarming, with one in nine women estimated to develop the disease during her lifetime, the highest rate in Asia. Factors such as limited awareness, late presentation, and fragmented healthcare systems contribute to delayed diagnosis and suboptimal outcomes. Hence, there is a pressing need for organized, structured, and efficient management systems tailored to the complex nature of breast cancer⁶.

Traditionally, breast cancer management in many centers follows a sequential and discipline-specific model, where patients are referred stepwise from one specialist to another surgeon, radiologist, oncologist, and pathologist resulting in prolonged waiting times and inconsistent treatment planning. Evidence from international studies shows that breast MDTs significantly shorten the interval from diagnosis to surgery or initiation of chemotherapy compared with conventional care^{7,8}.

In the context of breast cancer, site-specific MDTs have emerged as a cornerstone of high-quality care.

Their multidisciplinary deliberations ensure accurate staging, tailored treatment strategies, and uniform adherence to international guidelines, ultimately leading to improved survival and reduced recurrence⁹. Moreover, the inclusion of breast care nurses and allied health professionals enhances psychosocial support and patient engagement throughout the treatment continuum.

In Pakistan, the concept of site-specific MDTs remains relatively new but is steadily gaining momentum. At Madina Teaching Hospital, the establishment of dedicated breast cancer MDTs has demonstrated tangible benefits in improving patient care pathways. The study aimed to evaluate the effectiveness of site-specific MDT management in breast cancer patients by comparing diagnostic and treatment timelines, treatment modification rates, and patient satisfaction between MDT-managed and non-MDT-managed cases.

METHODOLOGY:

This cohort study was conducted at the Department of Breast Surgery, Madina Teaching Hospital (MTH), Faisalabad. A site-specific Multidisciplinary Team (MDT) for breast cancer management was formally established at MTH. The study duration was 12 months from October'24 to March'25 after the approval from Institutional ERC prior to initiation of data collection (letter no TUF/IRB/451/24). Written informed consent was obtained from all participants.

All female patients diagnosed with breast cancer and discussed in the breast MDT during the study period were included in the MDT cohort. For comparison, data of breast cancer patients managed during the same period at centers without a formal site-specific breast MDT (PINUM Cancer Hospital and Allied Hospital, Faisalabad) constituted the non-MDT cohort. Patients with incomplete or missing records, those who declined to provide informed consent, and those lost to follow-up before completion of initial treatment were excluded.

Data was obtained from two primary sources: (1) records and minutes of MDT meetings held at MTH, and (2) patient files and outpatient slip from non-MDT centers. Information included demographic characteristics, clinical and pathological features,

time intervals along the care pathway (presentation to diagnosis, diagnosis to surgery, and diagnosis to initiation of chemotherapy or radiotherapy), and treatment recommendations. For MDT cases, any modification in the treatment plan following team discussion was documented. Additionally, patient satisfaction with the diagnostic and treatment process was assessed through structured interviews using a validated satisfaction questionnaire.

Data was entered in excel sheet and analyzed using IBM SPSS Statistics version 26.0. Continuous variables such as age and time intervals were expressed as mean \pm standard deviation (SD) and compared using the independent samples t-test. Categorical variables such as marital status, menopausal status, tumor subtype, and satisfaction level were analyzed using the chi-square test or Fisher's exact test as appropriate and a p-value of < 0.05 was considered statistically significant.

RESULTS:

A total of 258 breast cancer patients were enrolled in this study, comprising 154 patients managed through the multidisciplinary team (MDT) approach and 104 patients receiving conventional management (non-MDT). Table 1 shows demographic features of study population.

The majority of patients in both cohorts presented with invasive ductal carcinoma (IDC), comprising 94.8% (n = 146) in the MDT group and 97.1% (n = 101) in the non-MDT group (overall 95.7%, n =

247). Tumor multiplicity differed significantly ($p = 0.032$). A significant difference in breast size distribution was also observed ($p = 0.042$).

The most pronounced difference was observed in biological subtype distribution ($p < 0.001$). Hormone Positive (ER/PR+, HER2-) constituted 53.8% of MDT cases and 42.3% of non-MDT cohort. HER2-enriched (HER2+) subtype was substantially higher in the non-MDT group (41.3%) compared with MDT patients (24.0%). Triple-negative tumors showed similar proportions (15.6% vs 16.3%). Preoperative systemic therapy was administered to comparable proportions of patients (65.6% MDT vs 67.3% non-MDT, $p = 0.044$), as both the non-MDT set ups have an established oncology unit. Table 2 shows tumors characteristics.

A statistically significant reduction in diagnostic and therapeutic delays was observed among breast cancer patients managed through the site-specific Multidisciplinary Team (MDT) approach compared with those receiving conventional, non-coordinated care (Table 3). The mean interval from initial presentation to histopathological diagnosis was substantially shorter in the MDT group. Similarly, the mean duration from diagnosis to definitive surgery was significantly reduced under MDT oversight. The most prominent disparity was noted in the time from diagnosis to initiation of chemotherapy, which averaged 93.73 ± 89.48 days in the MDT group versus 188.98 ± 97.24 days among non-MDT patients ($p < 0.001$).

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF BREAST CANCER PATIENTS

		Group		Total	p-Value
		MDT	Non-MDT		
Age (mean +S. D)		48.34+10.25	50.39± 7.23	49.17± 9.19	0.078
Marital Status	Married	149(96.8%)	90(86.5%)	239(92.6%)	0.002
	Unmarried	5(3.2%)	14(13.5%)	19(7.4%)	
Menopausal status	Premenopausal	62(40.5%)	52(50.0%)	114(44.4%)	0.085
	Postmenopausal	91(59.5%)	52(50.0%)	143(55.6%)	
Total		154(100.0%)	104(100.0%)	258(100.0%)	

TABLE 2: TUMOR CHARACTERISTICS AND BIOLOGICAL PROFILE

Characteristic	MDT	Non-MDT	Total	p-Value
Type of Cancer				
Invasive Ductal Carcinoma (IDC)	146 (94.8%)	101 (97.1%)	247 (95.7%)	0.450
Invasive Lobular Carcinoma (ILC)	3 (1.9%)	1 (1.0%)	4 (1.6%)	
Phyllodes Tumor	1 (0.6%)	1 (1.0%)	2 (0.8%)	
Mixed Histology	3 (1.9%)	0 (0.0%)	3 (1.2%)	
Other	1 (0.6%)	1 (1.0%)	2 (0.8%)	
Number of Masses/Bilaterality				
Unifocal	144 (93.5%)	88 (84.6%)	232 (89.9%)	0.032*
Bifocal-Multifocal	8 (5.2%)	16 (15.4%)	24 (9.3%)	
Multicentric	1 (0.6%)	0 (0.0%)	1 (0.4%)	
Multicentric + Multifocal	1 (0.6%)	0 (0.0%)	1 (0.4%)	
Breast Size				
A (Small)	4 (2.6%)	1 (1.0%)	5 (1.9%)	0.042*
B (Small-Medium)	12 (7.8%)	20 (19.2%)	32 (12.4%)	
C (Medium)	103 (66.9%)	64 (61.5%)	167 (64.7%)	
D (Large)	32 (20.8%)	19 (18.3%)	51 (19.8%)	
DD (Very Large)	3 (1.9%)	0 (0.0%)	3 (1.2%)	
Biological Subtype				
ERPR+, HER2-	83 (53.8%)	44 (42.3%)	127 (49.2%)	<0.001*
HER2-, ER-PR- (Triple Negative)	24 (15.6%)	17 (16.3%)	41 (15.9%)	
HER2+ (HER2-Enriched)	37 (24.0%)	43 (41.3%)	80 (31.0%)	
Other/Not Specified	10 (6.4%)	0 (0.0%)	10 (3.8%)	
Neoadjuvant Therapy				
Yes	101 (65.6%)	70 (67.3%)	171 (66.3%)	0.044***
No	53 (34.4%)	34 (32.7%)	87 (33.7%)	

TABLE 3: COMPARISON OF DIAGNOSTIC AND TREATMENT TIME INTERVALS BETWEEN GROUPS

	MDT	Non-MDT	p- value
	Mean+ S. D	Mean+ S. D	
Duration from presentation to Diagnosis	32.12+19.58	61.28+19.18	<0.001*
Diagnosis to Surgery (days)	247.41+121.46	313.88+126.00	<0.001*
Diagnosis to Chemotherapy duration (days)	93.73+89.48	188.98+97.24	<0.001*

DISCUSSION:

This study comparing 258 breast cancer patients (154 MDT-managed, 104 conventionally managed) demonstrates substantial advantages of site-specific MDT management across diagnostic, treatment timeline and care coordination metrics.

Our study demonstrates that management through a formally organized Multidisciplinary Team (MDT) was associated with substantially shorter delays across the diagnostic and treatment pathway compared with conventionally managed patients. The mean time from presentation to histopathological diagnosis (32.1 vs 61.3 days), from diagnosis to definitive surgery (247.4 vs 313.9 days), and from diagnosis to initiation of chemotherapy (93.7 vs 189.0 days) were all significantly lower in the MDT cohort (all $p < 0.001$). These reductions in time intervals are clinically important because shorter diagnostic and treatment intervals are linked to earlier stage at treatment and improved outcomes in several cancer types; recent meta-analyses of MDT care report benefits in survival and quality-of-care metrics that are plausibly mediated by more timely, evidence-based decision making and faster implementation of treatment recommendations¹⁰.

The time savings observed likely reflect multiple, complementary mechanisms afforded by MDT functioning. First, regular case review enables rapid consolidation of diagnostic data and a single unified plan that reduces repetitive referrals and unnecessary sequential consultations; second, MDTs increase adherence to guideline-recommended staging and biomarker testing which shortens the time to appropriate neoadjuvant or adjuvant therapy; third, MDTs often include care-coordination roles which expedite scheduling and reduce administrative delays. These benefits are consistent with qualitative and quantitative reports that MDTs improve management and accelerate care delivery¹¹.

Variation in tumor biological subtypes between the MDT and non-MDT cohorts (notably the higher proportions of HER2-enriched in the non-MDT cohort) requires cautious interpretation. This pattern might represent referral or selection bias: tertiary clinics frequently receive complex or biomarker-positive cases selected for targeted therapies or clinical trials. In LMIC contexts, variability in access to reliable HER2 testing and targeted agents has

been documented and contributes to observed epidemiologic heterogeneity between centres; therefore, differences in subtype distribution in our cohort plausibly reflect both biological and system-level factors^{12, 13}.

The higher proportion of unifocal disease in MDT patients (93.5% vs 84.6%) and the differences in breast size distribution (smaller B-cup more common in non-MDT) are interesting and may again reflect selection/referral biases and differing imaging practices. MDT pathways that standardize breast imaging (digital mammography ± ultrasound ± MRI when indicated) may identify multifocality with higher sensitivity in some centers, but conversely, centers with rigorous preoperative imaging may channel multifocal or complex cases to tertiary clinics producing an apparent enrichment of unifocal disease among MDT cases depending on referral flows. The clinical relevance of the breast size distribution is primarily in surgical planning and oncoplastic decision-making; the presence of very large breasts (DD) only in the MDT cohort suggests that MDTs are being used for more complex reconstructive/oncoplastic planning at our center. These observations highlight the importance of describing local referral networks when comparing cohorts. (No single explanation is definitive; future prospective tracking of referral source and preoperative imaging protocols would clarify causality.)

Contextualizing our findings in the Pakistani setting: multiple recent Pakistani studies have documented persistent diagnostic and treatment delays, high rates of late-stage presentation, and structural barriers (financial constraints, transportation, initial misdiagnosis in primary care, and limited access to coordinated oncology services). Our finding that MDT management markedly reduced delays therefore align with both the known deficiencies of uncoordinated care in Pakistan and establishing MTBs/Tumor Boards improves timelines and appropriateness of care even when resources are constrained. Implementing MDTs in tertiary and regional centers may be a high-yield health system intervention in Pakistan to reduce time toxicity and potentially improve outcomes^{14, 15}.

CONCLUSION:

Our study adds to a growing body of recent evidence that MDT organization in breast cancer care improves timelines of diagnosis and treatment. While causality cannot be fully proven in this comparison, the magnitude of the time reductions observed argues that MDTs, paired with care navigation and quality biomarker testing, are promising interventions to reduce time toxicity and may contribute to better clinical outcomes if broadly implemented and prospectively evaluated. Future work should focus on prospective, multicenter implementation and measurement of hard outcomes (stage at treatment, survival) and economic impact in the Pakistani context.

RECOMMENDATIONS:

Future studies should employ matched case-control analysis controlling for biological subtype, investigate specific sources of delays within conventional systems to identify targeted interventions, prospectively evaluate survival outcomes stratified by biological subtype, examine cost-effectiveness of MDT programs in resource-limited settings, and implement MDT programs with pre/post comparisons in institutions currently using conventional models.

CONFLICT OF INTEREST:

Nil

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