East African Scholars Journal of Medicine and Surgery
Abbreviated Key Title: EAS J Med Surg
ISSN: 2663-1857 (Print) & ISSN: 2663-7332 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-8 | Issue-6 | Jun-2026 | DOI: https://doi.org/10.36349/easjms.2026.v08i06.005

Original Research Article

Factors Associated with Post-Mastectomy Complications in Patients with Advanced Breast Cancer in Douala, Cameroon: A Multicenter Cross-Sectional Study

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Article History
Received: 29.04.2026
Accepted: 10.06.2026
Published: 12.06.2026

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: ***Background*:** Post-mastectomy complications remain a major concern in patients with advanced breast cancer, particularly in low-resource settings where delayed diagnosis and advanced-stage presentation are common. This study aimed to identify factors associated with post-mastectomy complications among patients with advanced breast cancer in Douala, Cameroon. ***Methods*:** A multicenter cross-sectional analytical study was conducted in four reference hospitals in Douala from January 1, 2014, to December 31, 2023. A total of 523 patients who underwent mastectomy for histologically confirmed breast cancer were included. Sociodemographic, clinical, paraclinical, therapeutic, and postoperative data were collected using a structured form. Bivariate and multivariate logistic regression analyses were performed using SPSS software version 28.0. Statistical significance was set at $p < 0.05$. ***Results*:** The mean age of the patients was 47.0 ± 12.1 years. The most frequent post-mastectomy complications were lymphedema, anxiety, seroma, depression, pain, surgical site infection, sexual dysfunction, sensory disturbance of the arm, hemorrhage, and hematoma. In multivariate analysis, age 65–75 years, consultation delay of 6–9 months, invasive lobular carcinoma, and stage IIIb disease remained independently associated with post-mastectomy complications, whereas surgeon specialty lost statistical significance after adjustment. ***Conclusion*:** Advanced age, delayed consultation, invasive lobular carcinoma, and stage IIIb breast cancer were associated with post-mastectomy complications. Early diagnosis, timely surgical management, and multidisciplinary perioperative care may reduce postoperative morbidity and improve outcomes among patients with advanced breast cancer in Cameroon.

Keywords: Breast Cancer, Mastectomy, Postoperative Complications, Lymphedema, Cameroon, Surgical Oncology.

INTRODUCTION

Breast cancer is one of the leading causes of cancer-related morbidity and mortality among women worldwide, particularly when diagnosed at advanced stages [1]. The burden of breast cancer is especially important in low- and middle-income countries, where access to organized screening programs, early diagnostic services, and specialized oncology care remains limited. In sub-Saharan Africa, delayed diagnosis and advanced-stage presentation continue to contribute substantially to breast cancer-related mortality despite gradual improvements in diagnostic and therapeutic resources [1].

Mastectomy remains a central component of the surgical management of locally advanced breast cancer. In many low-resource settings, including Cameroon, patients frequently present with large tumors, skin involvement, axillary lymphadenopathy, or other features requiring radical surgical management. Although mastectomy contributes to local disease control and may facilitate subsequent systemic and locoregional therapies, it is associated with several postoperative complications, including wound infection, seroma, hematoma, skin necrosis, chronic pain, shoulder dysfunction, sensory disorders, and lymphedema [2, 3].

Post-mastectomy complications may negatively affect both prognosis and quality of life. They may

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prolong hospitalization, increase treatment costs, delay wound healing, and postpone the initiation of adjuvant therapies such as chemotherapy, radiotherapy, endocrine therapy, or targeted therapy [4, 5]. Delays in completing multimodal treatment may compromise local and regional disease control and may increase the risk of recurrence in some patients [6]. Beyond their oncological consequences, these complications may also impair physical functioning, body image, psychological well-being, and social reintegration.

A better understanding of the determinants of post-mastectomy complications is therefore essential for improving perioperative care and optimizing patient outcomes. Previous studies have identified several potential risk factors, including advanced age, comorbidities, tumor stage, type of surgery, extent of axillary lymph node dissection, surgical site infection, and postoperative lymphedema [7–9]. Identifying patients at increased risk may help clinicians implement preventive measures, intensify postoperative monitoring, initiate early physiotherapy, and improve multidisciplinary care.

However, most available data on post-mastectomy complications and their determinants come from high-income countries, where early diagnosis, standardized surgical techniques, reconstructive options, and postoperative rehabilitation services are more widely available. Evidence from Central Africa remains limited, although patients in this region often present with more advanced disease and face major barriers to timely diagnosis and treatment. In this context, identifying factors associated with post-mastectomy complications may help improve surgical outcomes and guide locally adapted prevention strategies.

This study aimed to identify factors associated with post-mastectomy complications among patients treated for advanced breast cancer in four referral hospitals in Douala, Cameroon.

MATERIALS AND METHODS

Study Type, Location, and Duration

We conducted a multicenter analytical cross-sectional study with retrospective data collection over a 10-year period, from January 1, 2014, to December 31, 2023. The study was carried out in four reference hospitals in Douala, Cameroon: Douala General Hospital, Douala Gyneco-Obstetric and Pediatric Hospital, Laquintinie Hospital of Douala, and Military Hospital Region No. 2.

Study Population

The study targeted hospitalized patients receiving treatment for breast-related conditions in oncology, gynecology, and general surgery departments.

Inclusion criteria: Patients who underwent mastectomy for histologically confirmed breast cancer, as diagnosed by an oncologist, and who freely provided informed consent to participate.

Exclusion criteria: Patients who refused to give consent or did not undergo mastectomy were not included in the study.

Sampling and Minimum Sample Size

The sample was selected non-probabilistically, using an exhaustive recruitment of all eligible patients during the study period. The minimum sample size was determined using the standard formula applied in clinical and epidemiological research [10]. According to this formula, the minimum required sample size was 275 patients.

Data Collection and Ethical Considerations

Following approval from the Ethics Committee of the University of Douala (Approval No. 4264CEI-UDo) and administrative authorizations (Approval Nos. 037/AR/MINSANTE/HGD; 39/AR/MINSANTE/DHL; 2024/0255/L/HGOPED/DG/DFRI; 02240124CEHMR2-AR), the study was conducted in collaboration with department heads and medical staff. Patients were informed about the study's objectives and benefits during a five-minute interview, after which informed consent was obtained.

Data were collected using a validated and pretested data collection form. The information gathered included: Sociodemographic data (Age, sex, region of origin, religion, marital status, and blood group), Family history (Presence of breast cancer or other cancers (endometrial, ovarian, colorectal, renal), Personal history (Medical: HIV, hypertension (HTN), diabetes, benign or malignant breast tumors), Surgical (Previous breast surgery or other procedures).

Toxicological (Tobacco or alcohol consumption), Clinical data (Consultation reason, consultation delay, reported symptoms), physical examination findings (breast evaluation, tumor location, lymph node involvement), Paraclinical data (Morphological exams (mammography, ultrasound), histological evaluations (biopsy, fine-needle aspiration cytology), and tumor extension assessments (chest X-ray, abdominopelvic ultrasound, thoracoabdominopelvic CT scan)),Therapeutic data(Medical treatments: Chemotherapy, radiotherapy, hormone therapy, targeted therapy; Surgical procedures: ASA score, anesthesia type, mastectomy type, axillary lymph node dissection, drain placement). Psychological complications were assessed using the Anxiety and Depression Scale and the Female Sexual Function Index [11, 12].

Statistical Analysis

Data were entered into a structured database and analyzed using SPSS software version 28.0. Qualitative variables were summarized as frequencies and percentages, while quantitative variables were

expressed as means with standard deviations. Bivariate logistic regression was used to identify factors associated with post-mastectomy complications. Variables with statistical or clinical relevance were considered for multivariate logistic regression. Odds ratios (OR), adjusted odds ratios (AOR), 95% confidence intervals (95% CI), and p-values were reported. Statistical significance was set at $p < 0.05$. Variables with missing information were analyzed using available-case analysis. Missing observations were excluded from the corresponding regression models.

Post-mastectomy complications were defined as any medical, surgical, functional, or psychological event occurring after mastectomy and requiring medical evaluation or management. These included hemorrhage, hematoma, seroma, surgical site infection, pain, shoulder dysfunction, lymphedema, anxiety, depression, and sexual dysfunction.

RESULTS

Sociodemographic Factors of the Study Population

The mean age of participants was 47.0 ± 12.1 years. Women accounted for 99.4% of the study population. The most represented age group was 45–55 years (21.7%). Nearly half of the participants were married (44.5%), and the majority originated from the West Region of Cameroon (47.2%) (Table 1).

Postoperative Complications

Postoperative complications were observed across perioperative, immediate, early, late, and psychological domains. The most frequent complications were lymphedema in 97 patients (18.5%), anxiety in 64 patients (12.2%), seroma in 41 patients (7.8%), depression in 38 patients (7.3%), pain in 34 patients (6.5%), surgical site infection in 27 patients (5.2%), sexual dysfunction in 24 patients (4.6%), sensory disturbance of the arm in 16 patients (3.1%), perioperative hemorrhage in 13 patients (2.5%), and hematoma in 11 patients (2.1%) (Table 2).

Sociodemographic Factors Associated with Postoperative Complications

Bivariate logistic regression analysis revealed that only the 65-75 age group was significantly associated with postoperative complications (COR = 1.555; 95% CI: [1.042 - 16.936]; p = 0.008). Marital status was not significantly associated with post-mastectomy complications. Sex was not included in the regression analysis because of the very small number of male patients. (Table 3).

Clinical Factors Associated with Postoperative Complications

A consultation delay of 6 to 9 months before treatment was significantly associated with an increased risk of post-mastectomy complications (COR = 4.66; 95% CI: [1.031 - 33.929]; p = 0.004). However, other clinical variables, including medical, obstetric, toxicological, and family history, as well as tumor location, were not significantly associated with complications. Missing data were excluded from the corresponding regression analyses (Table 4).

Paraclinical Factors Associated with Postoperative Complications

Invasive lobular carcinoma (COR = 3.889, p = 0.01) and stage 3b disease (COR = 2.489, p = 0.007) were significantly associated with an increased risk of postoperative complications. Other factors, such as SBR grades and other histological types, were not statistically significant (Table 5).

Therapeutic Factors Associated with Postoperative Complications

Surgery performed by a general surgeon was significantly associated with an increased risk of postoperative complications (COR = 3.892, p = 0.002). Other types of surgeons, different mastectomy techniques, and adjuvant treatments (chemotherapy, radiotherapy, hormone therapy) showed no significant association with complications (Table 6)

Factors Associated with Post-Mastectomy Complications in Patients with Advanced Breast Cancer

Variables that were statistically significant in bivariate analysis were entered into a multivariate logistic regression model to identify independent predictors of post-mastectomy complications.

Multivariate logistic regression identified four independent predictors of post-mastectomy complications: age 65–75 years, consultation delay of 6–9 months, invasive lobular carcinoma, and stage IIIb disease. Surgeon specialty was no longer statistically significant after adjustment. (Table 7).

Table 1: Sociodemographic Factors

Sociodemographic Factors	***n(%)***
Age (years) [Min-Max]	47,0±12,1 [16 - 82]
Age-groups (years)	
[15-25]	48 (9.2%)
[25-35]	79 (15.1%)
[35-45]	94 (18.0%)
[45-55]	113 (21.7%)
[55-65]	81 (15.5%)

[65-75]	56 (10.7%)
[75-85]	51 (9.8%)
Gender	
Female	520 (99.4%)
Male	3 (0.6%)
Matrimonial status	
Marital status	n (%)
Married	233 (44.5%)
Single	159 (30.4%)
Widowed	76 (14.5%)
Divorced	35 (6.7%)
Not specified	20 (3.8%)
Region of Origin	
West	247 (47.2%)
Littoral	152 (29.1%)
Center	24 (4.6%)
South	22 (4.2%)
North-West	22 (4.2%)
Missing data	56 (10.7%)
***n** : frequency, **%** : percentage*	

Table 2: postoperative complications

Postoperative complications	**Management**	**n**	**%**
Perioperative complications			
Hemorrhage	Blood transfusion	13	2.5
Immediate complications			
Sensory disturbance of the arm	Clinical follow-up	16	3.1
Hematoma	Drainage	11	2.1
Anesthesia-related complications	Medical management	9	1.7
Early complications			
Severe anemia	Blood transfusion	8	1.5
Surgical site infection	Dressings and antibiotics	27	5.2
Pain	Analgesics	34	6.5
Shoulder functional impairment	Physiotherapy	13	2.5
Seroma	Aspiration	41	7.8
Hypovolemic shock	Blood transfusion	6	1.1
Severe thrombocytopenia	Medical management	1	0.2
Late complications			
Lymphedema	Compression sleeve	97	18.5
Persistent pain	Analgesics	5	1.0
Psychological complications			
Anxiety	Psychological support	64	12.2
Sexual dysfunction	Counselling	24	4.6
Depression	Psychological support	38	7.3

n: frequency; % calculated using the total sample size, N = 523.

Table 3: Bivariate logistic regression investigating the association between sociodemographic factors and postoperative complications

	Complications						
Sociodemographic factors	**Yes**		**No**				
	n	**%**	**n**	**%**	**COR**	**95% CI**	**p-value**
Age-groups (years)							
[15-25]	11	22,9	37	77,1	1,387	[0.323 - 8.631]	0,149
[25-35]	22	27,8	57	72,2	1,801	[0.085 - 11.726]	0,657
[35-45]	29	30,9	65	69,1	2,082	[0.112 - 6.223]	0,859
[45-55]	15	13,2	99	86,8	0,707	[0.096 - 7.952]	0,906
[55-65]	13	16	68	84	0,892	[0.029 - 3.315]	0,308
[65-75]	**14**	**25**	**42**	**75**	**1,555**	**[1.042 - 16.936]**	**0,008****

[75-85]	9	17,6	42	82,4	-	-	-
Marital Status							
Married	40	17,2	193	82,8	0,169	[0.129 - 7.886]	0,8
Single	32	20,1	127	79,9	0,206	[0.045 - 3.527]	0,409
Widowed	12	15,8	64	84,2	0,153	[0.091 - 8.075]	0,893
Divorced	18	51,4	17	48,6	1,154	[0.644 - 22.1]	0,571
Not specified	11	55	9	45	-	-	-
***COR**: Crude Odds Ratio; **CI**: Confidence Interval*							

Table 4: Bivariate logistic regression assessing the association between clinical data and the occurrence of postoperative complications

	Complications						
Clinical data	**Yes**		**No**				
	n	**%**	**n**	**%**	**COR**	**95%CI**	**p-value**
Consultation Delay							
<1 month	1	100	0	0	-		-
1-3 months	1	50	1	50	0,482	[0.029 - 3.315]	0,138
3-6 months	2	100	0	0	.		.
6-9 months	**81**	**69,2**	**36**	**30,8**	**4,66**	**[1.031 - 33.929]**	**0,004***
1 year or more	28	27,9	58	72,1	-		-
Gestational History							
Grand multigest	28	82,4	6	17,6	5,055	[0.038 - 29.161]	0,443
Multigest	57	41,9	79	58,1	0,781	[0.034 - 16.564]	0,457
Primigest	16	59,3	11	40,7	1,575	[0.021 - 19.66]	0,401
Nulligest	12	48	13	52	-		-
Medical History							
Previous breast tumor	12	26,1	34	73,9	1,096	[0.147 - 1.058]	0,999
Diabetes	41	35,7	74	64,3	0,698	[0.027 - 3.407]	0,999
HIV	8	57,1	6	42,9	0,29	[0.012 - 25.709]	0,763
Hypertension (HTN)	48	28	124	72	-		-
Toxicological history							
Smoking	12	48	21	52	0,755	[0.09 - 8.666]	0,106
Alcoholism	73	29,4	175	70,6	0,551	[0.029 - 8.315]	0,331
Herbal medicine use	28	43,1	37	56,9	-		-
Family history							
Breast cancer	22	57,9	16	42,1	0,945	[0.32 - 2.939]	0,957
Other cancers	13	39,4	10	60,6	-		-
Affected breast							
Right	13	5,2	238	94,8	1,566	[0.534 - 14.597]	0,414
Left	87	65,7	167	34,3	0,804	[0.337 - 7.916]	0,622
Both	13	72,2	5	27,8	-		-

***COR** : Crude Odds Ratio; **CI** : Confidence Interval*
Note: Consultation delay was documented in 208 patients (39.8%). Missing observations were excluded from regression analyses.

Table 5: Bivariate logistic regression assessing the association between paraclinical and pathological factors and postoperative complications

	Complications						
Paraclinical data	**Yes**		**No**				
	n	**%**	**n**	**%**	**COR**	**95%CI**	**p-value**
Histological Type							
Invasive ductal carcinoma	83	17,8	382	82,2	0,543	[0.288 - 3.918]	0,908
Invasive lobular carcinoma	**28**	**60,9**	**18**	**39,1**	**3,889**	**[1.038 - 14.643]**	**0,01***
Mixed tumor	2	28,6	5	71,4	-		-
High-grade phyllodes tumor	0	0	3	100	-		
Ductal carcinoma in situ	0	0	2	100	-		-
Scarff-Bloom-Richardson Grade							
Grade I	22	18,8	95	81,2	1,003	[0.129 - 7.177]	0,9

Grade II	35	18,4	155	81,6	0,978	[0.045 - 3.527]	0,409
Grade III	38	31,7	82	68,3	2,008	[0.091 - 8.075]	0,893
Not specified	18	18,8	78	81,3	-		-
Disease Stage							
Stage 0	1	16,7	5	83,3	1,2	[0.962 - 11.617]	0,058
Stage 1	0	0	6	100	-		-
Stage 2a	14	12,8	95	87,2	0,884	[0.582 - 9.261]	0,233
Stage 3a	32	20,6	123	79,4	1,561	[0.271 - 2.342]	0,678
Stage 3b	**56**	**29,3**	**135**	**70,7**	**2,489**	**[1.27 - 13.006]**	**0,007****
Stage 3c	3	42,9	4	57,1	4,5	[0.43 - 21.486]	0,912
Stage 4	7	14,3	42	85,7	-		-
COR : Crude Odds Ratio; CI : Confidence Interval							

Table 6: Bivariate logistic regression assessing the association between therapeutic data and the occurrence of postoperative complications

	Complications						
	Yes		**No**				
Therapeutic data	**n**	**%**	**n**	**%**	**COR**	**95%CI**	**p-value**
Simple total mastectomy							
Madden	9	45	11	55	1.227	[0.329 - 14.726]	0.41
Patey	2	40	3	60	-		-
Total mastectomy + ILND							
Madden	69	19.6	283	80.4	0.304	[0.705 - 4.369]	0.236
Patey	16	44.4	20	55.6	-		-
Halstead	3	100	0	0	.		.
Simple partial mastectomy	4	22.2	14	77.8	0.964	[0.32 - 2.939]	0.957
Partial mastectomy + ILND	5	11.1	40	88.9	0.078	[0.688 - 9.957]	0.158
Prophylactic mastectomy + LND	5	11.4	39	88.6	2.15	[0.129 - 8.723]	0.072
Chemotherapy							
Neoadjuvant	31	22.1	109	77.9	1.219	[0.537 - 29.805]	0.176
Adjuvant	7	18.9	30	81.1	-		-
Radiotherapy							
Neoadjuvant	1	50	1	50	0.235	[0.045 - 3.527]	0.409
Adjuvant	12	19	51	81	-		-
Hormone therapy							
Neoadjuvant	2	100	0	0	-		-
Adjuvant	0	0	5	100	-		-
Surgeon performing the procedure							
Gynecologist	68	19.1	288	80.9	1.46	[0.092 - 3.22]	0.503
General surgeon	34	38.6	54	61.4	3.892	[2.539 - 25.593]	0.002
Oncologic surgeon	11	13.9	68	86.1	-		-
***ILND** : ipsilateral lymph node dissection; **LND**: lymph node dissection; **COR** : Crude Odds Ratio; **CI** : Confidence Interval*							

Table 7: Multivariate logistic regression analysis of factors associated with post-mastectomy complications.

Factor	**COR**	**95% CI**	**p-value**	**AOR**	**95% CI**	**p-value**
Age 65–75 years	1.555	1.042–16.936	0.008	2.433	1.331–18.881	0.033
Consultation delay 6–9 months	4.660	1.031–33.929	0.004	3.142	1.035–21.789	0.024
Invasive lobular carcinoma	3.889	1.038–14.643	0.010	1.042	1.000–4.986	0.048
Stage IIIb disease	2.489	1.270–13.006	0.007	1.621	1.107–15.926	0.001
General surgeon	3.892	2.539–25.593	0.002	2.400	0.045–6.527	0.409

***COR**: crude odds ratio; AOR: adjusted odds ratio; CI: confidence interval.*

DISCUSSION

From an epidemiological perspective, the mean age of 47.0 ± 12.1 years observed in our study is consistent with previous reports from Cameroon and other sub-Saharan African countries, where breast cancer tends to occur at a younger age than in Europe and North America [13, 14]. Several African cancer registries have reported peak incidence rates between 40 and 55 years, contrasting with Western populations in which the

median age at diagnosis is generally above 60 years [15]. This younger age distribution may reflect demographic characteristics, reproductive factors, environmental exposures, and potential genetic influences. Importantly, breast cancer occurring during economically productive years imposes a considerable social and financial burden on patients, families, and healthcare systems.

Patients aged 65–75 years had a significantly higher risk of post-mastectomy complications in multivariate analysis (AOR = 2.433; p = 0.033). Advanced age has consistently been associated with increased postoperative morbidity because of reduced physiological reserve, impaired wound healing, decreased immune response, and a higher prevalence of chronic comorbidities such as hypertension, diabetes mellitus, and cardiovascular disease [16, 17]. Similar findings have been reported in large population-based studies evaluating postoperative outcomes among elderly women undergoing breast cancer surgery [18, 19]. These observations support the need for comprehensive preoperative assessment and optimization of comorbid conditions in older patients undergoing mastectomy.

Consultation delay emerged as one of the strongest predictors of postoperative complications in our study. Patients who presented between 6 and 9 months after symptom onset experienced a significantly higher risk of post-mastectomy morbidity. This finding is consistent with numerous studies conducted in sub-Saharan Africa, where delayed presentation remains one of the principal determinants of advanced-stage breast cancer diagnosis and poor treatment outcomes [20–22].

Late presentation is a multifactorial phenomenon. Several African studies have identified lack of awareness of breast cancer symptoms, fear of cancer diagnosis, fear of mastectomy, financial constraints, sociocultural beliefs, and initial consultation with traditional healers as major contributors to delayed healthcare seeking behavior [23–25]. In addition, limited access to specialized oncology services, diagnostic imaging, pathology facilities, and multidisciplinary cancer care further contributes to prolonged diagnostic intervals in many low-resource settings.

From a surgical perspective, delayed consultation often results in larger tumors, skin involvement, chest wall fixation, bulky axillary lymph node disease, and advanced locoregional spread. These characteristics frequently require more extensive resections and complete axillary lymph node dissections, thereby increasing operative complexity and postoperative morbidity. Similar observations have been reported in Nigeria, Ethiopia, Rwanda, Ghana, and other African countries, where advanced-stage disease remains the predominant mode of presentation [20–25].

These findings highlight the importance of strengthening breast cancer awareness campaigns, expanding access to diagnostic services, promoting early referral pathways, and implementing national breast cancer control programs. Earlier diagnosis would not only improve survival outcomes but could also reduce the burden of postoperative complications and healthcare costs.

Invasive lobular carcinoma was independently associated with post-mastectomy complications in our study. Although invasive ductal carcinoma remains the predominant histological subtype of breast cancer worldwide, invasive lobular carcinoma exhibits several distinctive pathological and clinical characteristics that may influence surgical outcomes [26–28].

Unlike ductal carcinoma, invasive lobular carcinoma is characterized by a diffuse infiltrative growth pattern resulting from loss of E-cadherin expression, a key cell adhesion molecule. This biological feature facilitates tumor dissemination through breast stroma without forming a well-defined mass, making clinical detection and radiological assessment more difficult [26, 27]. Consequently, the true extent of disease is frequently underestimated before surgery.

Several studies have demonstrated that invasive lobular carcinoma is more commonly associated with multifocality, multicentricity, larger tumor size at diagnosis, and bilateral breast involvement than invasive ductal carcinoma [28, 29]. These characteristics may complicate surgical planning and increase the need for wider resections or more extensive axillary procedures. In addition, imaging modalities such as mammography and ultrasound may underestimate tumor dimensions, leading to discrepancies between preoperative evaluation and pathological findings. The association observed for invasive lobular carcinoma should be interpreted with caution because the confidence interval was wide and this histological subtype represented a minority of cases in our cohort.

The increased postoperative morbidity observed among patients with invasive lobular carcinoma may therefore reflect a combination of biological aggressiveness, diagnostic challenges, and greater surgical complexity. Similar observations have been reported in both European and North American cohorts evaluating clinicopathological characteristics and surgical outcomes associated with this histological subtype [26–29].

Stage IIIb disease emerged as an independent predictor of post-mastectomy complications in our cohort. This finding is not surprising, as locally advanced breast cancer often requires more extensive surgical procedures involving wider skin excisions, complete axillary lymph node dissection, and occasionally chest wall reconstruction. Such procedures are inherently

associated with greater operative complexity and an increased risk of postoperative morbidity [30–32].

Patients with stage IIIb disease frequently present with skin infiltration, ulceration, inflammatory changes, fixation to underlying structures, or bulky axillary lymph node involvement. These characteristics complicate surgical dissection and increase the likelihood of lymphatic injury, prolonged drainage, wound complications, and postoperative infection. In addition, advanced disease is often associated with poorer nutritional status, anemia, and systemic inflammation, factors that may further impair wound healing and recovery.

Several international studies have demonstrated a relationship between extensive locoregional therapy, axillary surgery, and postoperative morbidity following breast cancer surgery [30–33]. McLaughlin *et al*., reported that extensive locoregional disease significantly increases the risk of surgical complications and prolonged postoperative recovery [32]. Similar observations have been reported in Asian and European populations, where advanced-stage breast cancer remains a major predictor of postoperative morbidity despite improvements in surgical techniques and perioperative care [31-33].

These findings reinforce the importance of early diagnosis and timely treatment. Reducing the proportion of patients presenting with stage III disease may substantially decrease the burden of postoperative complications while simultaneously improving oncological outcomes.

The relationship between advanced disease stage and postoperative morbidity may partly explain why lymphedema emerged as the most frequent complication in our study population.

Lymphedema was the most frequent complication observed in our study, affecting 18.5% of patients. This prevalence is consistent with the range reported in international literature, where the incidence of breast cancer-related lymphedema varies considerably according to the extent of axillary treatment, duration of follow-up, and diagnostic criteria used [30-34].

Breast cancer-related lymphedema remains one of the most disabling long-term consequences of breast cancer treatment. It results from disruption of normal lymphatic drainage pathways following axillary lymph node dissection and, in some cases, adjuvant radiotherapy. Patients may experience arm swelling, pain, heaviness, restricted mobility, recurrent infections, and significant deterioration in quality of life.

Recent systematic reviews and meta-analyses have estimated the incidence of lymphedema to range between 13% and 30% following axillary surgery, with substantially higher rates among patients undergoing complete lymph node dissection compared with sentinel lymph node biopsy [34, 35]. Obesity, advanced nodal disease, postoperative infection, and adjuvant radiotherapy have also been identified as important contributing factors.

The relatively high frequency observed in our cohort may partly reflect the advanced stage of disease at presentation and the frequent use of extensive axillary procedures. In many low-resource settings, sentinel lymph node biopsy remains unavailable or inaccessible, resulting in a greater reliance on complete axillary dissection. Early physiotherapy, patient education, compression therapy, and structured follow-up programs may therefore play an important role in reducing the severity and long-term impact of lymphedema.

Seroma was the second most common surgical complication observed in our study. Seroma formation remains one of the most frequently reported postoperative events following mastectomy and axillary surgery. Its incidence varies widely across studies, ranging from 10% to more than 50%, depending on surgical technique, drain management protocols, and definitions used [36, 37].

The pathophysiology of seroma formation is multifactorial and involves lymphatic disruption, inflammatory exudation, and creation of postoperative dead space. Large breast size, obesity, extensive axillary dissection, and prolonged operative duration have all been associated with increased seroma risk. Although often considered a minor complication, seroma may delay wound healing, increase infection risk, prolong hospitalization, and occasionally postpone adjuvant treatment initiation.

Various preventive strategies have been proposed, including quilting sutures, fibrin sealants, closed suction drainage systems, and modifications of surgical technique. However, evidence regarding the superiority of any single approach remains inconsistent, highlighting the need for individualized management strategies [36, 37].

Psychological complications represented an important component of postoperative morbidity in our study. Anxiety, depression, and sexual dysfunction were among the most frequently reported non-surgical complications. These findings are consistent with the growing body of literature demonstrating that breast cancer treatment affects not only physical health but also emotional well-being, self-esteem, body image, interpersonal relationships, and sexual functioning [38–40].

Anxiety was the most common psychological complication observed in our cohort. Fear of disease recurrence, uncertainty regarding prognosis, concerns

about treatment effectiveness, and changes in physical appearance following mastectomy are recognized contributors to psychological distress among breast cancer survivors (38,39). Similar prevalence rates have been reported in both African and international studies, although variations exist according to assessment tools, cultural context, and timing of evaluation.

Depression remains another major challenge after breast cancer treatment. Women experiencing depressive symptoms often report poorer treatment adherence, reduced quality of life, increased social isolation, and greater difficulty returning to normal daily activities. Several studies have shown that depression may adversely affect long-term survivorship and overall health outcomes if left unrecognized and untreated [39-41].

Sexual dysfunction was also documented in a proportion of patients. Although frequently underreported, sexual health disturbances following breast cancer treatment are increasingly recognized as an important survivorship issue. Changes in body image, loss of breast integrity, treatment-related fatigue, hormonal alterations, and psychological distress may all contribute to decreased sexual satisfaction and intimacy [42, 43]. In many African settings, cultural barriers may further limit discussion of sexual concerns during routine clinical follow-up, potentially leading to underestimation of their true prevalence.

Growing evidence supports the integration of psycho-oncology services into comprehensive breast cancer care. Structured psychological interventions, support groups, cognitive behavioral therapy, survivorship programs, and sexual counseling have demonstrated beneficial effects on anxiety, depression, coping strategies, and overall quality of life among breast cancer survivors [38–44]. These services remain insufficiently developed in many low-resource settings and should be considered an important component of multidisciplinary cancer management.

From a public health perspective, the identification of patients at increased risk of post-mastectomy complications provides an opportunity to improve perioperative care pathways in Cameroon and other low-resource settings. Early diagnosis initiatives, multidisciplinary management, specialized surgical training, physiotherapy services, psychosocial support programs, and structured postoperative follow-up may collectively reduce postoperative morbidity and improve patient outcomes. Future prospective studies are needed to validate these findings and evaluate interventions aimed at reducing the burden of post-mastectomy complications in sub-Saharan Africa.

Strengths and Limitations

This study has several strengths, including its multicenter design, relatively large sample size, and inclusion of patients managed in major referral hospitals. However, the cross-sectional nature of the study limits causal inference. Some variables relied on patient recall, which may have introduced recall bias. In addition, the retrospective nature of data collection resulted in missing information for several clinicopathological variables, which reduced the number of observations available for specific analyses. Finally, long-term postoperative outcomes were not evaluated.

Despite these limitations, the large sample size and multicenter design strengthen the external validity of our findings.

CONCLUSION

In conclusion, post-mastectomy complications remain a significant source of morbidity among women treated for advanced breast cancer in Douala. Age 65–75 years, consultation delay of 6–9 months, invasive lobular carcinoma, and stage IIIb disease were independently associated with post-mastectomy complications. Strengthening early detection strategies, improving access to specialized care, and optimizing perioperative management may contribute to reducing postoperative morbidity and improving patient outcomes in Cameroon.

Declarations

Conflicts of Interest

The authors declare that the research was conducted without any commercial or financial relationships that could be interpreted as a potential conflict of interest.

Funding: No specific funding was received for this study.

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Cite This Article: Jean Paul Engbang, Henry Essome, Fred Dikongue, David Yowe Sombe, Basile Essola, Marcelin Ngowe Ngowe (2026). Factors Associated with Post-Mastectomy Complications in Patients with Advanced Breast Cancer in Douala, Cameroon: A Multicenter Cross-Sectional Study. *East African Scholars J Med Surg, 8*(6), 248-258.