

THE IMPACT OF THE SHORT-TERM OUTCOMES OF BREAST CANCER SURGERY: A STUDY ON POST-OPERATIVE COMPLICATIONS, HOSPITAL STAY AND FACTORS ASSOCIATED WITH COMPLICATIONS OF PATIENTS

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Abstract

Background: Breast cancer is a prevalent malignant neoplasm among women, with its incidence rate increasing annually. The most recent guidelines advocate for the utilization of minimally invasive methods in the management of breast cancer, while a worldwide policy aimed at cost reduction promotes abbreviated hospital stays. Hospital stays are the norm for the majority of patients who endure significant breast cancer surgery afterward. The objective of this research was to examine the postoperative complications, and duration of hospitalization stay. **Materials and Methods:** 72 patients who underwent MRM or BCS for breast cancer (Stage I and II) or for locally advanced breast cancer (Stage IIIA and IIIB) after neo-adjuvant chemotherapy in Department of General Surgery, LHDM and Dr Prem Hospital, Panipat, Haryana were included in the study. **Result:** Results showed that only 24 out of 72 patients (33.33%) had post-operative complications. The Mean value of duration of hospital stay (days) of study subjects was 2.88 ± 1.06 . With the increase in age (years), risk factors associated with complications significantly increases with adjusted odds ratio of 1.227(1.042 to 1.444). Proportion of patients with VAS has mild pain was significantly lower in POD 1 as compared to at 12 weeks (p value <0.0001). **Conclusion:** Following post operation, patients should be guided and informed about the overall improvement in pain and quality of life, with care methods depending on the stage of the breast cancer and the patient's unique decision.

INTRODUCTION

Surgical treatment for breast cancer is a frequent procedure that can have immediate repercussions.^[1,2] Postoperative complications via tissue injury, wound healing, infection, and inflammation are activated by pro-metastatic systemic pathways. Major surgical postoperative complications were more prevalent following mastectomy, with or without immediate reconstruction, compared to breast-conserving surgery, according to the study.^[3-5] Additionally, significant surgical postoperative complications were found to be associated with a lower rate of survival, particularly after mastectomy.^[6,7]

Short-term post-operative complications encompass a spectrum of issues, varying in nature from procedure-specific complications associated with breast, axillary, and reconstructive procedures to general surgical complications such as infection, incision complications, and haemorrhage.^[8]

Postoperative complications pose a substantial apprehension for women undertaking surgical intervention for breast cancer.^[9] Women who undergo mastectomy, whether with or without immediate reconstruction, face an increased susceptibility to postoperative complications.^[10] It is critical that healthcare professionals are cognizant of these dangers and implement the necessary precautions to mitigate them.^[11] This study aims to evaluate the immediate ramifications of breast cancer surgery in terms of patient-associated risk factors for complications, duration of hospitalization, and post-operative complications.

MATERIALS AND METHODS

The study was conducted for the female patients with carcinoma breast at the Department of General Surgery, LHDM and Dr Prem Hospital, Panipat,

Haryana, India, from 1 Dec 2020 to 15 May 2022. The inclusion & exclusion criteria are given below:

Inclusion criteria

- All the patients who underwent MRM or BCS for breast cancer (Stage I and II)
- All the patients who underwent MRM or BCS in cases of locally advanced breast cancer (Stage IIIA and IIIB) after neo-adjuvant chemotherapy
- Patients with unilateral breast cancer.
- Only Female breast cancer patient

Exclusion Criteria

- Patients who underwent surgery outside the institute.
- Patients with metastatic breast cancer.
- Pregnant breast cancer patient.
- All the patient with Ductal Carcinoma in Situ (DCIS)

Patients with stage IV disease and those who required breast reconstruction following modified radical mastectomy (MRM).

The factors associated with short-term outcomes, such as post-operative complications and hospital stays exceeding three days, in patients undergoing MRM or BCS for the treatment of breast carcinoma were analysed. The observed incidence rate of post-operative complications ranged between 5% and 25%. Assuming (p)=20% with a 10% margin of error, the statistician determined the minimum sample size to be utilised as 62 patients at a 5% level of significance with p value <0.05.

The personal data sheet was collected to document the patients' "preoperative, intraoperative, and postoperative condition as well as other pertinent information. During the follow-up clinic visit, routine investigations were performed as required to evaluate the patient's general health. Any post-operative outcomes that resulted in modifications or delays in chemotherapy and radiotherapy were documented, as was the progression of the patient's care.

Postoperative morbidity was defined as any abnormal occurrence that occurred 1, 7, 1, and 3 months after surgery. The drain elimination day and daily drain output were recorded. Early outcome parameters were recorded, including "wound infection, seroma formation, necrosis of skin flaps, hematoma, re-exploration, blood transfusion, and duration of hospital stay".

The SF-8 (short form survey 8) was used to measure any changes in quality of life by comparing scores three months after surgery to those obtained before the procedure. The SF-8 has eight items i.e., "Physiological function, Vigorous activities, physical pain, general health, vital energy, social function, emotional function, mental health".

The visual analogue scale (VAS), a subjective pain rating scale, has been scientifically validated to assess both acute and chronic pain. The analogue scale was employed to assess the patients' mental satisfaction and pain levels. The participants were requested to rate their subjective sense of well-being and satisfaction with the procedure on the first post-

operative day and 12 weeks after the procedure on a scale of zero to ten.

The data entry was performed in the Microsoft EXCEL spreadsheet, and the Statistical Package for the Social Sciences (SPSS) software, version 25.0, manufactured by IBM in Chicago, USA, was utilised for the final analysis.

RESULTS & DISCUSSION

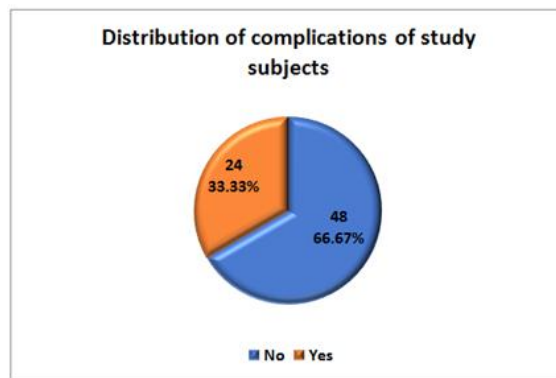


Figure 1: Distribution of complications of study subjects.

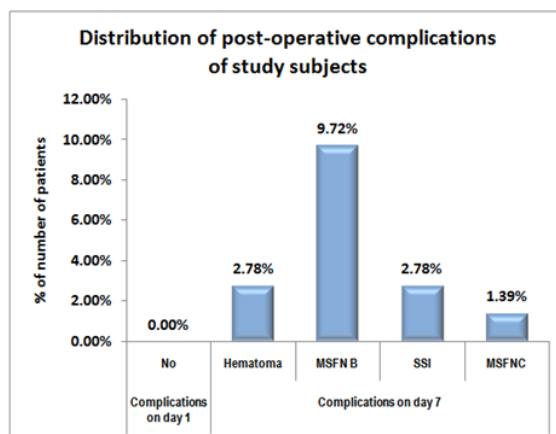


Figure 2: Distribution of post-operative complications of study subjects.

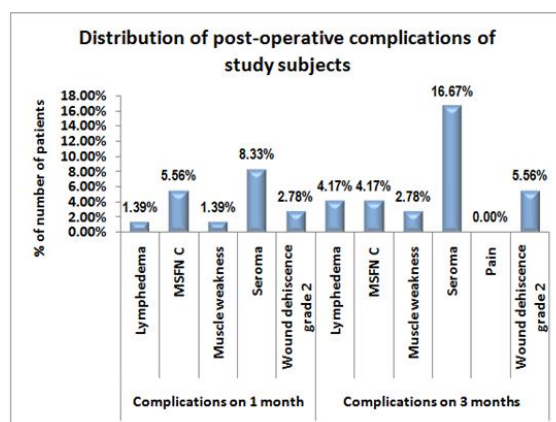


Figure 3: Distribution of post-operative complications of study subjects.

Post-operative complications, hospital stay and factors associated with complications of patients

were assessed and results are as follows. The results showed the post-operative complications on day 1, day 7, 1 month & 3 months, Hospital stay, Comparison of short- form survey- 8 score between at baseline and at 12 weeks, factors associated with complications such as weight (kg), age(years), duration of surgery(minutes), final diagnosis: stage 3b IDC, Stage 3a IDC menopause, surgical management: MRM, total number of lumps are investigated.

[Figure 1] depicts only 24 out of 72 patients (33.33%) had complications after post operation.

None of patient had complications on day 1. In 7(9.72%) patients, complications on day 7 was MSFN B followed by SSI [2(2.78%)] and hematoma [2(2.78%)]. Complication on day 7 was MSFNC in only 1 out of 72 patients (1.39%) [Figure 2].

In 6(8.33%) patients, complications on 1 month were seroma followed by MSFN C[4(5.56%)], wound dehiscence grade 2[2(2.78%)]. Complication on 1 month was lymphedema and muscle weakness in only 1 out of 72 patients (1.39%) [Figure 3].

In 12(16.67%) patients, complication on 3 months was seroma followed by wound dehiscence grade 2[4(5.56%)], MSFN C[3(4.17%)], lymphedema [3(4.17%)], muscle weakness [2(2.78%)]. Complications on 3 months was pain in none of the patient [Figure 3]. The post operative complications of breast cancer can elongate the number of stays in the hospital.

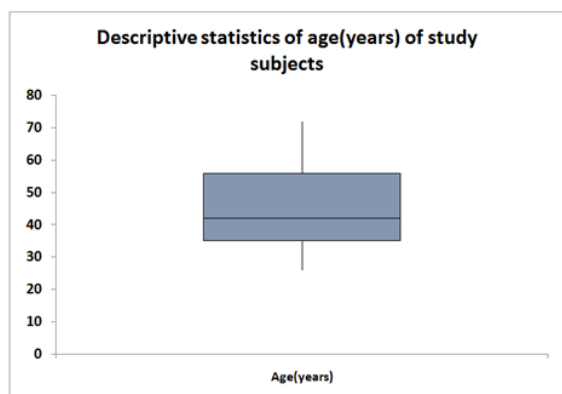


Figure 4: Descriptive statistics of duration of hospital stay(days) of study subjects.

In the present study, mean value of duration of hospital stay (days) of study subjects was 2.88 ± 1.06 with median (25th-75th percentile) of 3(2-3). The mean length of hospital stay was 2.1 days in a study conducted by Rizvi et al.^[9] On the other hand, a study conducted by Joshi A et al,^[14] observed a lengthier mean hospital stay of 12.76 days among 60 patients who underwent breast cancer surgery. According to a study conducted by Gümüş et al,^[15] the average length of hospital stay for 76 patients undergoing breast cancer surgery was 6.18 days. A combination of factors, such as the trend towards less extensive operations (BCS) rather than radical mastectomies, may have contributed to the decrease in hospital stays. According to the VAS scale, most patients

experience moderate and mild pain during their hospital stays.

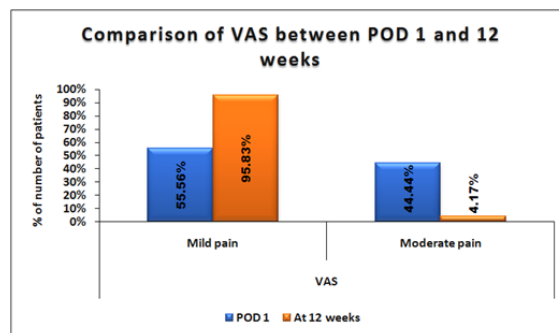


Figure 5: Comparison of VAS between POD 1 and 12 weeks.

In the present study, proportion of patients with VAS showed moderate pain was significantly higher in POD 1 as compared to at 12 weeks. (Moderate pain with 44.44% vs 4.17% respectively). Proportion of patients with VAS has mild pain was significantly lower in POD 1 as compared to at 12 weeks. (Mild pain: - 55.56% vs 95.83% respectively, p value <0.0001)

Median (25th-75th percentile) of VAS in POD 1 was 3(3-4) which was significantly higher as compared to 12 weeks (2(1-2), (p value <.0001). Almost, 25% of the patients experienced persistent moderate-to-severe discomfort following the procedure which can be sure by the survey method SF-8.

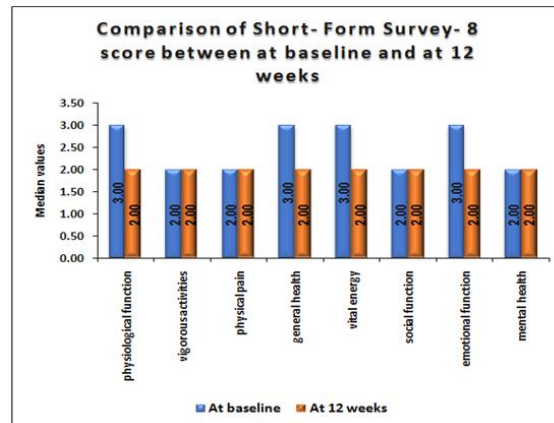


Figure 6: Comparison of Short- Form Survey- 8 score between at baseline and at 12 weeks(non-parametric variables)

Significant improvement was seen in all components of SF-8: physiological function (p value<.0001), vigorous activities (p value<.0001), physical pain (p value<.0001), general health (p value=0.001), vital energy (p value=0.0001), social function (p value<.0001), emotional function (p value<.0001), mental health (p value=0.0001) between baseline and at 12 weeks. (p value <.05). Many variables depend on the different risk factors associated with the post-operative complications.

On performing univariate regression, weight(kg), age(years), duration of surgery(minutes), final

diagnosis: stage 3b IDC, Stage 3a IDC menopause, surgical management: MRM, total number of lumps: 2 were significant risk factors of complications. With the increase in weight (kg), age(years), duration of surgery(minutes), risk of complications significantly increases with odds ratio of 1.07(1.014 to 1.129), 1.063(1.017 to 1.111), 1.026(1.01 to 1.043) respectively. Patients with final diagnosis: stage 3b IDC, Stage 3a IDC, menopause, surgical management: MRM, total number of lumps: 2 had significantly high risk of complications with odds ratio of 41.315(1.913 to 892.179), 23.741(1.076-523.995), (2.914(1.04 to 8.167), 3.24(1.143 to 9.182), 5.671(1.024 to 31.402) respectively [Table 5].

After controlling for confounding variables, age (years) and surgical management: MRM were determined to be significant independent risk factors

of complications in multivariate regression. The risk of problems increases dramatically with age (years), with an adjusted odds ratio of 1.227 (1.042 to 1.444). Table 5 demonstrated that patients receiving surgical therapy for MRM had an adjusted odds ratio of 7.901, indicating a significantly higher risk of complications (1.356 to 9.439). It is critical to acknowledge that the risk factors associated with postoperative complications following breast cancer surgery can differ based on the specific surgical procedure performed and the individual's state of health.

Most importantly, surgical treatment of breast cancer was discovered to be associated with enhanced health outcomes for affected women. There are specific postoperative complications that are influenced by a multitude of factors; when counselling patients about postoperative complications, it is crucial to consider these variables.

Table 1: Distribution of post-operative complications of study subjects.

Complications	Frequency	Percentage
Overall post-operative complications	24	33.33%
Complications on day 1		
No	0	0.00%
Complications on day 7		
Hematoma	2	2.78%
MSFN B	7	9.72%
SSI	2	2.78%
MSFNC	1	1.39%
Complications on 1 month		
Lymphedema	1	1.39%
MSFN C	4	5.56%
Muscle weakness	1	1.39%
Seroma	6	8.33%
Wound dehiscence grade 2	2	2.78%
Complications on 3 months		
Lymphedema	3	4.17%
MSFN C	3	4.17%
Muscle weakness	2	2.78%
Seroma	12	16.67%
Pain	0	0.00%
Wound dehiscence grade 2	4	5.56%

Table 2: Comparison of VAS between POD 1 and 12 weeks.

VAS	POD 1(n=72)	At 12 weeks(n=72)	P value
Mild pain	40 (55.56%)	69 (95.83%)	<.0001*
Moderate pain	32 (44.44%)	3 (4.17%)	
Mean ± SD	3.53 ± 0.65	1.81 ± 0.85	<.0001¶
Median (25th-75th percentile)	3 (3-4)	2 (1-2)	
Range	3-5	1-4	

Wilcoxon Signed Ranks Test, * Fisher's exact test

Table 3: Comparison of Short- Form Survey- 8 score between at baseline and at 12 weeks.

Short- Form Survey- 8 score	At baseline(n=72)	At 12 weeks(n=72)	P value
Physiological function			
Mean ± SD	3.36 ± 1	2.4 ± 1	<.0001¶
Median(25th-75th percentile)	3(3-4)	2(2-3)	
Range	1-5	1-5	
Vigorous activities			
Mean ± SD	2.76 ± 1.05	1.97 ± 1.01	<.0001¶
Median(25th-75th percentile)	2(2-3)	2(1-3)	
Range	1-5	1-4	
Physical pain			
Mean ± SD	2.6 ± 0.82	1.88 ± 0.87	<.0001¶
Median(25th-75th percentile)	2(2-3)	2(1-2)	
Range	1-4	1-4	
General health			
Mean ± SD	2.68 ± 1.11	2.22 ± 0.95	0.001¶

Median(25th-75th percentile)	3(2-3)	2(2-3)	
Range	1-5	1-5	
Vital energy			
Mean \pm SD	2.56 \pm 0.69	2.18 \pm 0.91	0.0001¶
Median(25th-75th percentile)	3(2-3)	2(1.75-3)	
Range	1-4	1-4	
Social function			
Mean \pm SD	2.64 \pm 1.12	2.06 \pm 0.75	<.0001¶
Median(25th-75th percentile)	2(2-3)	2(2-3)	
Range	1-5	1-4	
Emotional function			
Mean \pm SD	3.19 \pm 0.72	2.39 \pm 0.74	<.0001¶
Median(25th-75th percentile)	3(3-4)	2(2-3)	
Range	2-5	1-4	
Mental health			
Mean \pm SD	2.44 \pm 1.02	1.83 \pm 0.8	0.0001¶
Median(25th-75th percentile)	2(2-3)	2(1-2)	
Range	1-5	1-5	

Wilcoxon Signed Ranks Test

Factors associated with complications

Table 4: Univariate logistic regression to find out factors associated with complications.

Variable	Beta coefficient	Standard error	P value	Odds ratio	Odds ratio Lower bound (95%)	Odds ratio Upper bound (95%)
Weight(kg)	0.068	0.027	0.013	1.070	1.014	1.129
Age(years)	0.061	0.023	0.007	1.063	1.017	1.111
Duration of surgery (minutes)	0.026	0.008	0.001	1.026	1.010	1.043
Final diagnosis						
Stage 1 IDC				1.000		
Stage 1 ILC	1.801	2.981	0.546	6.056	0.018	2089.420
Stage 2a IDC	0.453	2.149	0.833	1.573	0.023	106.172
Stage 2b IDC	2.745	1.591	0.085	15.568	0.688	352.171
Stage 2a medullary ca	10.048	29.389	0.732	23106.653	0.000	2.40E+29
Stage 2b ILC	1.801	2.981	0.546	6.056	0.018	2089.420
Stage 3b IDC	3.721	1.568	0.018	41.315	1.913	892.179
Stage 3a IDC	3.167	1.579	0.045	23.741	1.076	523.995
Stage 3a ILC	1.801	2.981	0.546	6.056	0.018	2089.420
Menopause	1.070	0.526	0.042	2.914	1.040	8.167
Surgical management						
BCS				1.000		
MRM	1.176	0.531	0.027	3.240	1.143	9.182
Total number of lumps						
1				1.000		
2	1.735	0.873	0.047	5.671	1.024	31.402

Table 5: Multivariate logistic regression to find out factors associated with complications.

Variable	Beta coefficient	Standard error	P value	Odds ratio	Odds ratio Lower bound (95%)	Odds ratio Upper bound (95%)
Weight(kg)	0.024	0.034	0.481	1.024	0.958	1.094
Age(years)	0.204	0.083	0.014	1.227	1.042	1.444
Duration of surgery (minutes)	0.020	0.015	0.182	1.020	0.991	1.051
Final diagnosis						
Stage 1 IDC				1.000		
Stage 1 ILC	3.728	2.930	0.203	41.607	0.133	12983.61
Stage 2a IDC	0.441	2.245	0.844	1.554	0.019	126.670
Stage 2b IDC	2.167	1.793	0.227	8.732	0.260	293.495
Stage 2a medullary Ca	4.174	3.203	0.192	64.982	0.122	34593.61
Stage 2b ILC	1.828	2.979	0.540	6.218	0.018	2134.578
Stage 3b IDC	3.783	1.956	0.053	43.962	0.951	2031.973
Stage 3a IDC	3.158	1.791	0.078	23.527	0.704	786.686
Stage 3a ILC	-0.800	3.133	0.799	0.449	0.001	208.783
Menopause	-1.569	1.237	0.205	0.208	0.018	2.353
Surgical management						
BCS				1.000		
MRM	2.067	1.653	0.014	7.901	1.356	9.439
Total number of lumps						
1				1.000		
2	0.756	1.090	0.488	2.131	0.252	18.043

CONCLUSION

In summary, our study highlights the immediate impacts of breast cancer surgery, emphasizing post-operative complications, hospital stays, and associated risk factors. With a notable complication rate of 33.33%, including seroma, wound dehiscence, lymphedema, and hematoma, our findings underscore the need for personalized care strategies tailored to individual patient profiles. The mean hospital stay of 2.88 days reflects a trend towards shorter stays, potentially influenced by advancements in surgical techniques and healthcare policies. The factors associated with post-operative complications increase with increasing weight(kg), age(years), duration of surgery(minutes), final diagnosis: stage 3b IDC, Stage 3a IDC menopause, surgical management: MRM, total number of lumps, signaling the importance of tailored interventions to optimize outcomes Overall, irrespective of the type of management, all patients had better quality of life and mental health at 12 weeks post-surgery. While our study offers valuable insights, it's important to acknowledge its limitations, including its shorter follow up period and single-center setting. Future research should aim for longer follow-up, multicenter studies to validate our findings and provide more robust evidence for clinical practice.

REFERENCES

- Gurrado A, Pasculli A, Toma A, Maruccia M, Elia R, Moschetta M, Telegrafo M, De Luca GM, Lavermicocca W, Poli E, Prete FP (2023) Mastectomy with one-stage or two-stage reconstruction in breast cancer: analysis of early outcomes and patient's satisfaction. *Updates Surg* 75(1):235-43. <https://doi.org/10.1007/s13304-022-01416-0>
- Hejl L, Raft J, Leufflen L, Rauch P, Buhler J, Abel-Decollogne F, Routiot T, Hotton J, Salleron J, Marchal F (2021) Quality of life, anxiety, and postoperative complications of patients undergoing breast cancer surgery as ambulatory surgery compared to non-ambulatory surgery: A prospective non-randomized study. *J Gynecol Obstet Hum Reprod* 50(2):101779. <https://doi.org/10.1016/j.jogoh.2020.101779>
- Morrison-Jones V, West M (2023) Post-Operative Care of the Cancer Patient: Emphasis on Functional Recovery, Rapid Rescue, and Survivorship. *Curr Oncol* 30(9):8575-85. <https://doi.org/10.3390/curroncol30090622>
- De Vita R, Zoccali G, Buccheri EM, Costantini M, Botti C, Pozzi M. (2017) Outcome evaluation after 2023 nipple-sparing mastectomies: our experience. *Plast reconstr surg* 139(2): 335e-7e. <https://doi.org/10.1097/PRS.0000000000003027>
- Yan H, Gao P, Kong X, Wei J, Fang Y, Wang J (2022) Study on short-term cosmetic effects and quality of life after breast cancer modified radical mastectomy combined with one-stage prosthesis implantation. *J Cancer Res Ther* 18(7):1988-93. https://doi.org/10.4103/jcrt.jcrt_1217_21
- Cuffolo G, Pandey A, Windle R, Adams T, Dunne N, Smith B (2023) Delayed-immediate breast reconstruction: An assessment of complications and outcomes in the context of anticipated post-mastectomy radiotherapy. *J Plast Reconstr Aesthetic Surg* 77:319-27. <https://doi.org/10.1016/j.bjps.2022.11.031>
- Al-Hilli Z, Wilkerson A (2021) Breast surgery: management of postoperative complications following operations for breast cancer. *Surg Clin North Am* 101(5):845-63. <https://doi.org/10.1016/j.suc.2021.06.014>
- Bayraktar S, Batoos S, Okuno S, Glück S (2019) Immunotherapy in breast cancer *J Carcinog* 18:2. https://doi.org/10.4103/jcar.JCar_2_19
- Rizvi FH, Khan MK, Almas T, Ullah M, Shafi A, Murad MF, et al. (2020) Early postoperative outcomes of breast cancer surgery in a developing country. *Cureus* 12(8):e9941.
- Traore B, Diarra AM, Kita M (2020) Complications of breast cancer surgery at Conakry oncological surgery unit. *Pan African Medical J* 37:327. <https://doi.org/10.11604/pamj.2020.37.327.21427>
- Alkabban FM, Ferguson T (2022) Breast cancer. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing;. <https://doi.org/10.7759/cureus.9941>
- Abdulnabi A, Jiad A, AL-Hijaji M (2016) Frequency of early postoperative complications of breast cancer following modified radical mastectomy. *Thi-Qar Med J* 11:135-41.
- Jagsi R, Jiang J, Momoh AO, Alderman A, Giordano SH, Buchholz TA, et al. (2016) Complications after mastectomy and immediate breast reconstruction for breast cancer: a claims-based analysis. *Ann Surg* 263(2):219-27. <https://doi.org/10.1097/SLA.0000000000001177>
- Joshi A, Qureshi IP, Khan I, Patidar S (2018) Outcome of breast conserving surgery and modified radical mastectomy in early breast carcinoma –a retrospective study. *AIMDR* 4(3):1-6.
- Gümüř M, Satıcı Ö, Ülger BV, Oğuz A, Tařkesen F, Girgin S (2015) Factors affecting the postsurgical length of hospital stay in patients with breast cancer. *J Breast Health* 11(3):128-31. <https://doi.org/10.5152/tjbh.2015.2546>