



E-ISSN: 2616-3470

P-ISSN: 2616-3462

© Surgery Science

[www.surgeryscience.com](http://www.surgeryscience.com)

2024; 8(4): 37-41

Received: 16-08-2024

Accepted: 22-09-2024

**Suha Riyadh Shlaka**

Thi-Qar Health Directorate, Thi-Qar  
Governorate, Iraq

**Mohanad A Al-Ridha**

Thi-Qar Medical College, Thi-Qar  
Governorate, Iraq

## Incidence of early and late complications following modified radical mastectomy

**Suha Riyadh Shlaka and Mohanad A Al-Ridha**

**DOI:** <https://doi.org/10.33545/surgery.2024.v8.i4a.1118>

### Abstract

**Background:** Breast cancer is the most frequent cancer among women, with an estimated 2.3 million new cases diagnosed worldwide in 2020, representing about 25% of all cancers in women.

**Aim of the study:** To evaluate the early and late complications following MRM among patients diagnosed with breast cancer and associated comorbidities.

**Patients and method:** A retrospective study of 142 participants who had breast cancer were treated with Modified Radical Mastectomy between June 2019 and June 2022 in AL- Imam AL Hussein Teaching Hospital, Al-Habobi Teaching Hospital, Al-Nasiriyah Teaching Hospital and The Oncology center in AL-Nasiriyah city. For studying and analyzed the general patient data in respect to age and sex as well as analysis of early and late postoperative complications.

**Results:** Among 142 patients with breast cancer, females were the predominant gender 138 (97.2%), the highest case frequency in the age group of 31 -49 years old as compared to a lowest figure in the group of less than 30 years old. Early postoperative complications were axillary numbness with pain 48 patients, early lymphedema 24 patients, seroma 17 patients, wound infection 11 patients and flap necrosis 2 patients of total number respectively. While late complications were chronic pain 18 patients, chronic lymphedema 12 patients, Restricted arm movement 4 patients, Shoulder stiffness 4 patients and hypertrophy scar 2 patients.

**Conclusion:** Early postoperative detection of breast cancer related surgical complications is more frequency to occur compare to late complication, however, there is no association between complication and comorbidity.

**Keywords:** Incidence, early, late, complications, modified, radical mastectomy

### Introduction

Breast cancer is the most common cancer among women, with 2.3 million new cases worldwide in 2020, accounting for 25% of female cancers. Incidence rates vary, from 27 per 100,000 in Middle Africa to 92 per 100,000 in North America. In resource-poor countries, for every two women diagnosed, one dies from the disease. Iraq's age-related incidence rate is higher than Turkey, Iran, Saudi Arabia, and Bahrain but lower than Jordan and Kuwait <sup>[1]</sup>. Risk factors include age, family history, smoking, BRCA1/2 gene mutations, and radiation exposure <sup>[2]</sup>. Early detection is essential, with mammograms recommended for women at moderate-to-high risk starting at age 45 <sup>[3]</sup>. Breast surgery has evolved significantly since its inception over 3,000 years ago. In 1804, Seishu Hanaoka performed the first mastectomy under general anesthesia <sup>[4]</sup>. The radical mastectomy, introduced by Halsted in 1894, involved extensive tissue removal but did not improve survival rates compared to more conservative surgeries. By the 1970s, breast-conserving surgery (BCS) with radiation became standard treatment for early-stage breast cancer <sup>[5]</sup>. Skin-sparing and nipple-sparing mastectomies offer better cosmetic outcomes for certain patients <sup>[6]</sup>. Modified radical mastectomy (MRM), which removes the entire breast and axillary lymph nodes but spares the pectoralis major muscle, is a widely used treatment <sup>[7]</sup>. Indications for MRM include prior radiation therapy, multicentric disease, or inflammatory breast cancer <sup>[8]</sup>. Contraindications are few but include metastatic disease and inability to undergo general anesthesia <sup>[9]</sup>. Complications of MRM include seroma formation, wound infection, lymphedema, and chronic pain. Seromas are the most common, occurring in up to 85% of cases <sup>[10]</sup>. Long-term issues include lymphedema, atrophy, and limited arm mobility <sup>[11]</sup>. Preventive measures involve early arm mobilization and the use of advanced surgical tools like harmonic scalpels <sup>[12]</sup>.

**Corresponding Author:**

**Suha Riyadh Shlaka**

Thi-Qar Health Directorate, Thi-Qar  
Governorate, Iraq

Breast cancer during pregnancy presents unique challenges. Surgery is generally safe, with mastectomy preferred in early pregnancy and lumpectomy in later stages [13]. Radiation is delayed until after childbirth [14]. Aim of study to evaluate the early and late complications following MRM among patients diagnosed with breast cancer and associated comorbidities.

**Methods**

This retrospective study included 142 participants (both male and female) who were diagnosed with breast cancer and underwent Modified Radical Mastectomy (MRM) over a period of three years, from June 2019 to June 2022. The study was conducted at AL-Imam AL-Hussein Teaching Hospital, Al-Habobi Teaching Hospital, Al-Nasiriyah Teaching Hospital, and the Oncology Center in Al-Nasiriyah city. Data collection took place over four months, from July to October.

**Inclusion Criteria:** Patients who underwent surgery (MRM).

**Exclusion Criteria:** Patients who underwent Modified Radical Mastectomy for palliative purposes. Data were collected using a specially designed case recording form, which was adapted from a previous study examining the "early and late complications of modified radical mastectomy performed" in 2019 [15]. The data were coded, and each questionnaire was assigned a unique serial number. The researcher entered the data into a computer using the Statistical Package for Social Sciences (SPSS) version 26, with the assistance of an academic supervisor and a consultant statistician. Data were presented using descriptive statistics, including frequency, percentage, mean, standard deviation, and range (minimum-maximum values). The significance of differences in percentages (qualitative data) was tested using the Pearson Chi-square test, with Yates' correction or Fisher's Exact test applied when appropriate. Quantitative data were tested using an independent samples T-test. A P-value of 0.05 or less was considered statistically significant.

**Ethical Considerations:** All collected data were kept confidential and used solely for the purpose of the study. Approval was obtained from The Scientific Board of General Surgery-Ethical Committee prior to initiating the study. Ethical clearance was granted by The Ethical Committee of the Iraqi

Ministry of Health after securing scientific approval for the study.

**Results**

A total of 142 participants with breast cancer were included within this study, Females were the predominant gender among participants 138 (97.2%) compare to only 4 (2.8%) males. The age range was between (24 -74) years: Less than 30 years old were 19 (13.4%) patients. Those with age of 31-49 years old were 68 (47.9%). 50 years old and above were 55 (38.7%) with a mean age of 45.1 ± 14.2 years as shown in table 1.

**Table 1:** The age distribution among participants with modified radical breast cancer mastectomy (N=142)

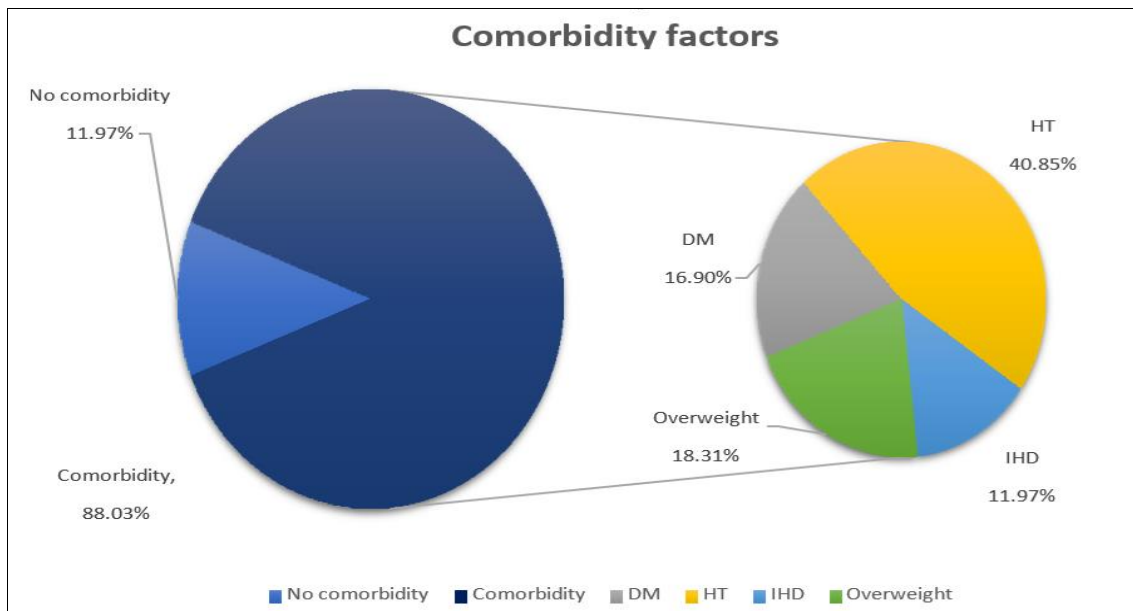
Age of the participants		No	%
Age Groups	≤ 30 years old	19	13.4
	31- 49 years old	68	47.9
	≥ 50 years old	55	38.7
Mean ± SD (Min-Max)		45.15 ± 14.27(24 - 74) years old	
Gender	Male	4	2.8
	female	138	97.2

Table 2 show that the majority of the participants 111 (78.2%) were married while the rest 31 (21.8%) were not. According to the family history of breast cancer, 14(9.8%)had history of breast cancer in their families, while the majority 128 (90.2%)didn't mention a history of breast cancer in their families as shown in table 2.

**Table 2:** The sociodemographic features of the participants (N=142).

Sociodemographic			
Marital Status	Married	111	78.2
	Single	31	21.8
Family History	No	128	90.2
	Yes	14	9.8

Among the participants with breast cancer, hypertension was the main comorbidity factor registered in the record of 58 (40.8%) of them, followed by overweight among 26 (18.3%), diabetes mellitus 24 (16.9%) and ischemic heart disease 17 (12.0%) respectively (Figure 1).



**Fig 1:** The distribution of the comorbidity factors among participants.

Table 3 reveals that the majority of the participant’s tumor were at stage III 82 (57.7%) patients, 48 (33.8%) were at stage II and 12 (8.5%) at stage I. About two third 102 (71.8%) of the

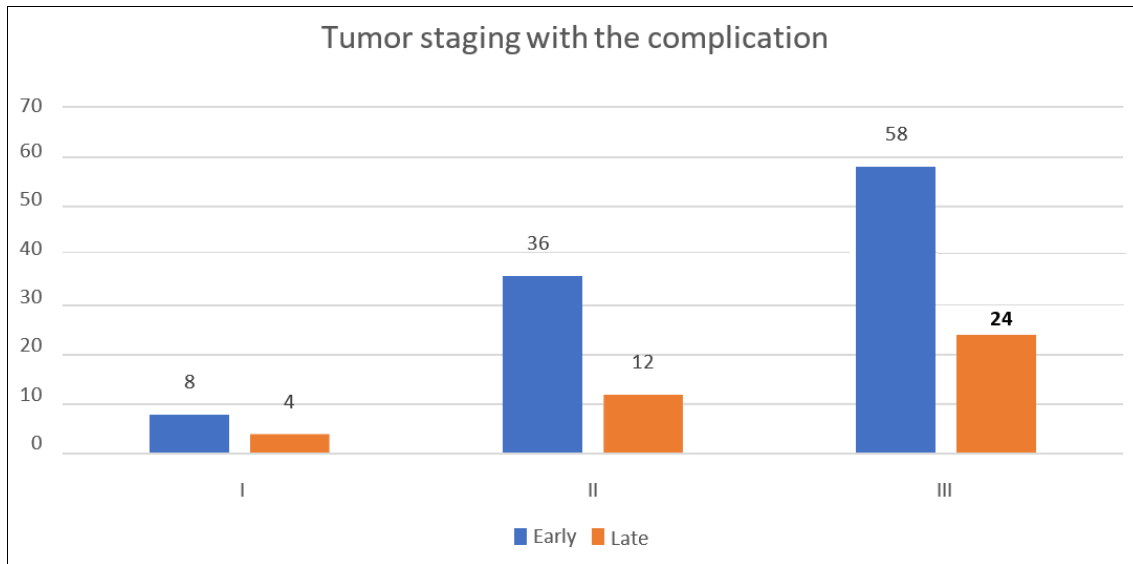
participants had early complication after modified radical mastectomy due to breast cancer while the rest 40 (28.2%) developed late complication after mastectomy

**Table 3:** The participant’s tumor staging (N=142)

		No	%
Stage of tumor	I	12	8.5
	II	48	33.8
	III	82	57.7
Complications	Early	102	71.8
	Late	40	28.2

Tumor stage III participants was the most frequently to developed complication after modified radical mastectomy in the breast cancer patients as 58/82 patients developed early complication and 24/82 developed late complication, stage II was less frequently stage that related to developed complication

post-surgery 36/48 early and 12/48 late complication and final stage I was less than the other stages as 8/12 developed early complication and 4/12 developed late complication as show in figure 2.



**Fig 2:** The distribution of tumor stage according to the complication post modified radical mastectomy among Participants.

According the presentation of the cases, breast mass was the most frequency in 61 (43.0%), followed by breast mass with ipsilateral axillary LN, axillary LN, skin involvement, bloody nipple discharge and nipple retraction (23.3%, 14.1%, 9.2%, 6.3% and 4.2%) respectively as shown in table 4.

participants as it developed among 18 (12.7%) of the participants following by chronic lymphedema 12 (8.5%), 4 (2.8%) for each of restricted arm movement and shoulder stiffness respectively and only 2 (1.4%) had hypertrophy scar as a late complication as show in table 5.

**Table 4:** The presentation of the tumor among participants (N=142)

Presentation	N	%
Breast mass	61	43.0
Breast mass with ipsilateral axillary LN	33	23.2
Axillary LN	20	14.1
Skin involvement	13	9.2
Bloody nipple discharge	9	6.3
Nipple retraction	6	4.2

According to the complication post-surgery, axillary numbness with pain was the main early complication mentioned post MRM due to breast cancer among 48 (33.8%) patients, followed by early lymphedema among 24 (16.9%), seroma 17 (12.0%), wound infection 11 (7.7%) and flap ecchymosis 2 (1.4%) as shown in table 5 and figure 2. While the late complication, chronic pain was the most frequent late complication among

**Table 5:** The distribution of the complication post modified radical mastectomy due to breast cancer among participants (N=142).

Complications		No	%
Early	Axillary numbness with pain	48	33.8
	Early lymphedema	24	16.9
	Seroma	17	12
	Wound infection	11	7.7
	Flap ecchymosis	2	1.4
	Late	Chronic pain	18
Chronic lymphedema		12	8.5
Restricted arm movement		4	2.8
Shoulder stiffness		4	2.8
Hypertrophy scar		2	1.4

Table 6 show the comorbidity factor was found to be unrelated to early and late complications as P value (0.935).

**Table 6:** The association of comorbidity factors with the post-surgery complication type

Variables		Complication				P Value
		Early complication		Late complication		
		N=102	%	N=40	%	
Comorbidity factors	DM	18	17.6	6	15.0	0.935
	HT	42	41.2	16	40.0	
	IHD	11	10.8	6	15.0	
	No	13	12.7	4	10.0	
	Over wt.	18	17.6	8	20.0	

Table (7) reveals that the tumor stage was found to be statistically un related to the early and late complication after surgery as p value was more than 0.05.

**Table 7:** The association of the tumor stage to the post-surgery complication type

Variables		Complication				P Value
		Early complication		Late complication		
		N=102	%	N=40	%	
Stage	I	8	7.8	4	10.0	0.800
	II	36	35.3	12	30.0	
	III	58	56.9	24	60.0	

## Discussion

Breast cancer is a leading cause of morbidity and mortality in women worldwide. Early detection and effective treatment are key to improving outcomes [16]. The management of breast cancer is typically interdisciplinary [17], and in Iraq and other developing countries, Modified Radical Mastectomy (MRM) is the standard procedure [18]. This surgery involves the removal of the breast, including the skin, areola, nipple, and most axillary lymph nodes, while sparing the pectoralis major muscle [19]. Few studies in Iraq have explored early and late complications following MRM for breast cancer [20]. This study examined the prevalence of such complications among breast cancer patients who underwent MRM, along with their demographic characteristics and tumor stages. In this study, 97.2% of the participants were female, consistent with the study by Jalil *et al.* (2019) in Iraq [21], and 47.9% were aged 31-49, similar to findings by Mehdi *et al.* (2014) in Oman [22]. Most participants (78.2%) were married, aligning with Alhusban *et al.* (2019) in Jordan [23]. A family history of breast cancer was reported by 9.8%, close to the 16.66% reported by Kaushal *et al.* (2019) in India [24]. Comorbidities were prevalent in 88.03% of participants, higher than rates found by Arneja *et al.* (2021) in Canada and Möhl *et al.* (2021) in Germany [25, 26]. Hypertension (40.8%) was the most common comorbidity, consistent with Anwar *et al.* (2021) in Indonesia [27]. Early complications occurred in 71.8% of participants, primarily axillary numbness with pain (33.8%), in line with Kuliski *et al.* (2021) in Poland [28]. Early lymphedema affected 16.9% of participants, consistent with Boccardo *et al.* (2014) in the U.S. [29]. Tumor staging showed that 57.7% of participants were at stage III when undergoing mastectomy, similar to Obadiel *et al.* (2020) in Yemen [30]. Chronic pain (12.7%) was the most common late complication, aligning with Sulak *et al.* (2022) in Turkey [31]. Chronic lymphedema affected 8.5% of patients, lower than Abdulnabi *et al.* (2019) in Basrah, Iraq [32]. Comorbidities were not linked to post-MRM complications ( $p=0.935$ ), but hypertension and seroma ( $p=0.004$ ) and diabetes mellitus and wound infection ( $p=0.002$ ) showed significant associations [33]. No association was found between tumor stage and complications ( $p=0.8$ ), contrasting with findings from Shaikh *et al.* (2013) in Pakistan [34].

## Conclusion

Females complained most about breast cancer, but men can too. Most breast cancer patients in our research were under 50. Early problems after MRM were most common in breast cancer patients, with axillary numbness and discomfort being the most common. With advanced breast cancer, early and late post-modified radical mastectomy complications increased. Breast mass with ipsilateral axillary lymph nodes was the most common tumor manifestation in this investigation. No correlation between complications and comorbidities.

## References

1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *International Journal of Cancer*. 2015 Mar 1; 136(5).
2. Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, *et al.* Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. *The Lancet Global Health*. 2020 Feb 1; 8(2).
3. Heena H, Durrani S, Riaz M, AlFayyad I, Tabasim R, Parvez G, *et al.* Knowledge, attitudes, and practices related to breast cancer screening among female health care professionals: a cross-sectional study. *BMC Women's Health*. 2019 Dec;19(1):01-10.
4. Raigon-Ponferrada A, Recio ME, Guerrero-Orriach JL, Malo-Manso A, Escalona-Belmonte JJ, Aliaga MR, *et al.* Breast Cancer and Anesthesia. *Current Pharmaceutical Design*. 2019 Jan 1;25(28):2998-3004.
5. Tousimis E, Haslinger M. Overview of indications for nipple-sparing mastectomy. *Gland Surgery*. 2018 Jun;7(3):288.
6. Bland KI, Copeland EM, Editors. *The Breast: Comprehensive Management of Benign and Malignant Disorders*. 3<sup>rd</sup> ed. St. Louis: WB Saunders; 2004.
7. Burstein HJ, Curigliano G, Thürlimann B, Weber WP, Poortmans P, Regan MM, *et al.* Customizing local and systemic therapies for women with early breast cancer: the St. Gallen International Consensus Guidelines for treatment of early breast cancer 2021. *Annals of Oncology*. 2021 Oct 1;32(10):1216-1235.
8. Kaidar-Person O, Offersen BV, Boersma LJ, de Ruyscher D, Tramm T, Kühn T, *et al.* A multidisciplinary view of mastectomy and breast reconstruction: Understanding the challenges. *The Breast*. 2021 Apr 1;56:42-52.
9. Boughey JC, Goravanchi F, Parris RN, Kee SS, Frenzel JC, Hunt KK, *et al.* Improved postoperative pain control using thoracic paravertebral block for breast operations. *Breast Journal*. 2009 Sep-Oct;15(5):483-488.
10. Nezhadhosseini SE, Fotuhi K, Vejdani M. Risk factors associated with surgical site infection after breast surgery. *Reviews in Clinical Medicine*. 2015;2(1):45-58.

11. Chandrakar N, Shinde RK. Study of the early complications of modified radical mastectomy performed. *International Surgery Journal*. 2018 Dec 27;6(1):239-243.
12. Liang S, Hallet J, Simpson JS, Tricco AC, Scheer AS. Omission of axillary staging in elderly patients with early-stage breast cancer impacts regional control but not survival: a systematic review and meta-analysis. *Journal of Geriatric Oncology*. 2017 Mar 1;8(2):140-147.
13. Dialani V, Lai KC, Slanetz PJ. MR imaging of the reconstructed breast: What the radiologist needs to know. *Insights into Imaging*. 2012 Jun;3(3):201-213.
14. Covelli AM. Choosing mastectomy: A qualitative exploration of the increasing mastectomy rates in women with early-stage breast cancer. University of Toronto (Canada); c2015.
15. Obadiel YA, Al-Ba'adani MN, Haidar QH. Early complications following modified radical mastectomy. *Open Access Library Journal*. 2020, 7.
16. Bhushan A, Gonsalves A, Menon JU. Current state of breast cancer diagnosis, treatment, and theranostics. *Pharmaceutics*. 2021 May 14;13(5):723.
17. Shao J, Rodrigues M, Corter AL, Baxter NN. Multidisciplinary care of breast cancer patients: a scoping review of multidisciplinary styles, processes, and outcomes. *Current Oncology*. 2019 Jun, 26(3).
18. Alwan N, Shawkat MM. Treatment options and follow-up among Iraqi patients with breast carcinoma. *European Journal of Medical and Health Sciences*. 2020 Mar 24, 2(2).
19. Bland KI, Chang HR, Copeland III EM. Modified radical mastectomy and simple mastectomy. In: *The Breast*. 2018 Jan 1. p. 443-461.
20. Alassadi MM, Al-Alwan NA. Treatment follow-up in patients diagnosed with breast cancer in Iraq. *Iraqi Postgraduate Medical Journal*. 2020, 19(4).
21. Jalil AT, Dilfi SH, Karevskiy A. Survey of breast cancer in Wasit Province, Iraq. *Global Journal of Public Health Medicine*. 2019 Nov 1;1(2):33-38.
22. Mehdi I, Monem EA, Al Bahrani BJ, Al Kharusi S, Nada AM, Al Lawati J, *et al*. Age at diagnosis of female breast cancer in Oman: Issues and implications. *South Asian Journal of Cancer*. 2014 Apr;3(2):101-106.
23. Alhusban RY. Changed body image as perceived by Jordanian women undergoing breast cancer treatment. *Asian Pacific Journal of Cancer Prevention*. 2019 Mar 26;20(3):767-773.
24. Kaushal M, Shukla A, Patidar S, Mathur RK. Comparative study of modified radical mastectomy and breast conservative surgery in early breast cancer. *International Journal of Surgery*. 2019;3(1):317-319.
25. Arneja J, Brooks JD. The impact of chronic comorbidities at the time of breast cancer diagnosis on quality of life and emotional health following treatment in Canada. *PLoS One*. 2021 Aug 26, 16(8).
26. Möhl A, Orban E, Jung AY, Behrens S, Obi N, Chang-Claude J, *et al*. Comorbidity burden in long-term breast cancer survivors compared with a cohort of population-based controls from the MARIE study. *Cancer*. 2021 Apr 1;127(7):1154-60.
27. Anwar SL, Cahyono R, Prabowo D, Avanti WS, Choridah L, Dwianingsih EK, *et al*. Metabolic comorbidities and the association with risks of recurrent metastatic disease in breast cancer survivors. *BMC Cancer*. 2021 Dec;21(1):01-03.
28. Kuliński W, Kosno M. Quality of life in women after mastectomy: clinical and social study. *Wiadomości Lekarskie*. 2021 Jan 1;74(3):429-435.
29. Miller CL, Specht MC, Skolny MN, Horick N, Jammallo LS, O'Toole J, *et al*. Risk of lymphedema after mastectomy: potential benefit of applying ACOSOG Z0011 protocol to mastectomy patients. *Breast Cancer Research and Treatment*. 2014 Feb;144(1):71-77.
30. Obadiel YA. Early complications following modified radical mastectomy among breast cancer patients admitted to Al Gomhory Teaching Hospital, Sana'a, Yemen between Jan. 2019-Jan. 2020. *Open Access Library Journal*. 2020;7(12):1.
31. Sulak M, Ahiskalioglu A, Yayik A, Karadeniz E, Celik M, Demir U, *et al*. The effect of ultrasound-guided serratus plane block on the quality of life in patients undergoing modified radical mastectomy and axillary lymph node dissection: a randomized controlled study. *Anaesthesiology Intensive Therapy*. 2022 Mar 10, 54(1).
32. Abdulnabi AN, Merdan I. Evaluating the effect of axillary lymph node involvement and dissection in the development of post-mastectomy lymphedema. *Iraqi National Journal of Medicine*. 2019, 1(1).
33. Radhakrishna A, Suggaiah L. Analysis of perioperative risk factors for complications following modified radical mastectomy: a longitudinal study. *International Journal of Anatomy, Radiology and Surgery*. 2021.
34. Shaikh K, Shabbir MN, Ahmed I, Soomro S, Najam MS. Frequency of early complications after modified radical mastectomy in breast cancer in tertiary care centre. *Pakistan Journal of Surgery*. 2013;29(1):17-12.

**How to Cite This Article**

Shlaka SR, Al-Ridha MA. Incidence of early and late complications following modified radical mastectomy. *International Journal of Surgery Science*. 2024;8(4):37-41.

**Creative Commons (CC) License**

This is an open-access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.