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COMPLICATIONS OF AXILLARY CLEARANCE FOR CARCINOMA OF THE BREAST IN ERBIL CITY

[*1]Dr. Luqman Mohammed Azeez, [2]Dr. Kawa Mohammed Mawlood Bajalan, [3]Dr. Chya Mohammed Azeez

[1]M.B.Ch.B-FICMS, Rizgary Teaching Hospital, Erbil, Iraq.
[2]M.B.Ch.B-F.I.C.M.S., Rizgary Teaching Hospital-Erbil, Iraq,
[3]M.B.Ch.B-FK.BMS., Emergency Hospital, Erbil, Iraq.

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***Corresponding Author: Dr. Luqman Mohammed Azeez**
M.B.Ch.B-FICMS, Rizgary Teaching Hospital, Erbil, Iraq.

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ABSTRACT

Background: The study aims to investigate complications resulting from axillary lymph node dissection (ALND) in breast cancer surgery and identify the reasons behind these issues. ALND is crucial for detecting nodal metastases and maintaining regional control, but biological variables may cause malignant cells to infiltrate lymph nodes rather than visceral organs. **Patients and methods:** This retrospective cross-sectional hospital-based study and carried out during September 2020 to August 2021 in Erbil City-Iraq at private and public hospitals. We enrolled 110 patients who underwent modified radical mastectomy and breast-conserving surgery at private or public hospitals. The complications of surgery were examined objectively and subjectively and defined as either present or absent. All patients underwent level 1 and 2 or 3 axillary lymph node dissection. **Results:** The vast majority 96.1% of cases in level I and II had post-operative seroma and 100.0% of case had post-operative seroma in level III. About 52.9% of case had lymphedema in level I and II and about 59.3% of cases had lymphedema in all levels. In level I and II about 88.2% they had numbness or paresthesia in upper medial arm while about 89.8% they had it. Only 6.4% of cases they experienced skin flap necrosis and 1.8% of them faces wound dehiscence. No cases had hemorrhage or muscle paralysis. **Conclusions:** The study found that axillary lymph node dissection is effective in treating regional node disease, with common complications including seroma, lymph edema, paresthesia, and upper arm numbness.

KEYWORDS: Breast Cancer, Complications of Axillary, Carcinoma, Erbil.

INTRODUCTION

The diagnosis of breast cancer (BC) is the most prevalent type of illness among women worldwide, and because of the sickness, it is the second most common reason for people to pass away after lung cancer. The number of cases and deaths caused by breast cancer have both grown in the developing countries.[1] Over the course of the last three decades, there has been a substantial amount of progress made in therapy options for BC that can be surgically. Tinier tumors discovered during mammography screening, use of adjuvant systemic treatment for node-positive and node-negative breast cancer, and greater awareness of Axillary lymph node dissection (ALND) adverse effects, the need for routine ALND has been re-evaluated. Regardless of the fact that the breast regularly drains lymph fluid to the axillary lymph nodes, the internal mammary lymph nodes, and the intrapleural lymph nodes, only the axillary lymph nodes are examined during surgical stage. This is due to the fact that the lymphatic stream carrying the most data is directed to the axilla. In modern times, in order to simplify the process of establishing pathologic anatomy and the evolution of metastatic disease, a nomenclature that is depended on the relationship of the lymph nodes to the pectoralis minor muscle have been utilized extensively.[1,2]

– The Level I nodes, also known as the low nodes, are located laterally and below the pectoralis minor muscle's lateral border along the side of the chest.

- The lymph nodes of the Level II group, which is the middle group, placed behind pectoralis muscle, minor muscle.

- The Level III nodes, often known as the higher nodes, may be found medial to the pectoralis minor muscle's medial border, as well as below it the border of the clavicle's inferior aspect.

The elimination of levels I, II, and III constitutes a total ALND. This procedure often calls for the transection or excision of the pectoralis minor muscle as well as the sacrifice of the medial pectoral nerve. When employing normal pathology methods, around 20–25 lymph nodes are found on average.[2] During a partial ALND, levels I and II are excised without the need of transecting this muscle; on average, 15–20 lymph nodes are removed. A low ALND will eliminate level I, and you will typically recover between four and six nodes. Axillary sampling is the elimination of one or more axillary nodes located from the lower axilla without determining the exact anatomical limits of the region.[3] In order to manage local illness, ALND entails an undeniable and sometimes intolerable risk of consequences such seroma, infection, and lymphedema. Sentinel lymph node dissection (SLND), which has less morbidity than ALND, was created to reliably grade tumor draining axillary nodes. ALND is still the standard of therapy for patients whose sentinel lymph nodes (SLNs) include metastases, whereas only SLND is the approved approach for patients whose sentinel lymph nodes (SLNs) do not have any evidence of malignancy on histological examination.

Since ALND was introduced, cancer biology has improved. Biological factors may cause malignant cells to infiltrate lymph nodes instead of visceral organs, just as certain tumors metastasize to particular organs but not others. ALND is the standard of therapy for patients whose sentinel lymph nodes (SLNs) have metastases. SLND alone is approved for individuals whose SLNs are tumor-free.[4]

The aim of the study*:* Study the complication that happen due to Axillary lymph node dissection and finding the reasons that causes these complications.

PATIENTS AND METHODS

Study design and settings: We performed a retrospective cross-sectional hospital-based study and the study carried out during September 2020 to August 2021 in Erbil City-Iraq at private and public hospitals.

Study population: The study enrolled 110 patients who underwent modified radical mastectomy (MRM) and breast-conserving surgery (BCS) at private and public hospitals to evaluate the efficacy and characterize the incidence of Axillary Lymph Node Dissection (ALND) complications in patients were examined objectively and subjectively and defined as either present or absent. All patients underwent level I and II or III ALND associated with mastectomy or BCS.

Inclusion criteria: All women who have been diagnosed histologically with invasive breast carcinoma without distant metastases were included in the current study.

Exclusion Criteria: Patients with breast and concomitant of other malignancies, or having fractures, or previous surgery in the upper limb ipsilateral to the ALND in addition to male patients were excluded from this study.

Data Collection: Data was collected using structured questionnaire designed to collect information from the files and medical records of the patients underwent operation in hospitals. All the records and data were examined for accuracy and completeness; then the needed information were extracted including demographic characteristics of study participants, type of surgery; number of lymph nodes retrieved by pathologists; number of lymph nodes positive for metastasis; and complications of ALND.

Surgical Procedures: All patients underwent level I and II ALND or III associated with MRM or BCS. Operations were performed under general anesthesia. The pectoralis major and the pectoralis minor muscles preserved. Axillary vein making visible and preserved, thoracodorsal and long thoracic nerve preserved. Pectoralis fascia is usually not opened and unless the tumor is adherent. The axillary fat and nodal tissue between the long thoracic nerve and subscapular vascular bundle is carefully dissected, often this is performed en block with the specimen. The wound closed in layers over the redivac suction drain.

Surgery Outcome: The efficacy of ALND was defined as the retrieval of ≥ 8 lymph nodes. Lymphedema was defined as a difference > 2 cm in the upper arm circumference between the arm ipsilateral to the ALND and the nonsurgical arm. Seroma was defined as accumulation of fluid that was either aspirated or treated conservatively in the axillary space after the discontinuance of the drain. Restriction of arm movement was defined as any degree of restriction in abduction of the arm ipsilateral to ALND. Postoperative infection referred to patients who were prescribed antibiotics with the intention to treat infection. Pain and paresthesia assessment relied on patient reported symptoms for instance, shoulder weakness and nerve injury.

Ethical Considerations: This study was submitted to the Ethics and Scientific committees of Surgery Program at Arab Board of Health Specialization, for ethical approval. Confidentiality and anonymity of data were ensured. Since the study was retrospective, obtaining the patients written consent permission was not applicable.

Statistical Analysis: The data recorded on a specially designed questionnaire, collected and entered in Microsoft Excel worksheet-2016 and then analyzed using appropriate data system which is called Statistical Package for Social Sciences (SPSS) version 28 and the results were compared between patients with different variables, with a statistical significance level of ≤ 0.05. The results presented as rates, ratio, frequencies, percentages in tables Chi square tests and fisher Exact test.

RESULTS

majority Table 1 shows that (86.4%) of women were married and 13.6% of them were single, 17.3% of cases were smokers, 15.5% of patients DM, only 6.4% of cancer cases received radiotherapy before surgery while most (71.8%) of them received radiotherapy after surgery followed by 11.8% of them received chemotherapy before surgery while majority (84.5%) of patients reported chemotherapy postoperatively and the same amount (84.5%) of cases received hormonal treatment postoperatively.

Table 1: Marital status and receiving treatments before and after surgery.

Variables	Categories	Frequency	Percent
Marital status	**Single**	15	13.6
	Married	95	86.4
Smoking history	**Yes**	19	17.3
	No	91	82.7
DM history	**Yes**	17	15.5
	No	93	84.5
Radiotherapy history before surgery	**No**	103	93.6
	Yes	7	6.4
Chemotherapy before surgery	**No**	97	88.2
	Yes	13	11.8
Radiotherapy history after surgery	**No**	31	28.2
	Yes	79	71.8
Chemotherapy after surgery	**No**	17	15.5
	Yes	93	84.5
Hormonal treatment after surgery	**No**	17	15.5
	Yes	93	84.5
Total		110	100

Table 2 shows that 6.4% of them received antibiotic for infection, 13.6% of participants used NACT, nearly half (46.4%) of cases had first stage followed by22.7% were in the second stage and 28.2% of them went through third stage of breast cancer, the majority diagnosed with ductal carcinoma while minority diagnosed with lobular carcinoma.

Table 2: Receiving antibiotics, determining stages of breast cancer, tissue, tumor and incision among patients.

Variables	Categories	Frequency	Percent
Receiving antibiotic for infection	Yes	7	6.4
	No	103	93.6
NACT	Yes	15	13.6
	No	95	86.4
Breast cancer stage	0	3	2.7
	1	51	46.4
	2	25	22.7
	3	31	28.2
Tissue diagnosis	Ductal	99	90.0
	Lobular	11	10.0

Table 3 determines that there was a significant statistically association between level of axillary clearance and breast and chest axillary numbness, more than one third (39.0%) of all levels group faced numbness while only 17.6% of level I, II level of axillary clearance group had breast and chest axillary numbness, Chi square test was significant and p-value was 0.014. History of pain in axilla, 25(43.5%) of level I, II patients experienced the pain while 81.5% of all levels level of axillary clearance had pain in axilla, Chi square test was significant and p-value was 0.000. Limited shoulder or arm movement, postoperative seroma, upper arm postoperative lymphedema, numbness or paresthesia in upper medial arm, and numbness and paresthesia in axilla showed no significant statistical differences.

Table 3: Association between level of axillary clearance and studied parameters.

Parameters	Categories	Level of axillary clearance		p-value
		Level I, II	All levels	
Breast and chest axillary numbness	**Yes**	9 (17.6)	23 (39.0)	**0.014***
	No	42(82.4)	36(61.0)	
History of pain in axilla	**Yes**	25 (43.5)	49 (81.5)	**0.000***
	No	26(56.5)	10(18.5)	
Limited shoulder or arm movement	**Yes**	4 (7.8)	2 (3.4)	0.413**
	No	47 (92.2)	57 (96.6)	
Postoperative seroma	**Yes**	49(96.1)	59(100.0)	0.213**
	No	2(3.9)	0(0.0)	
Upper arm postoperative lymphedema	**Yes**	27(52.9)	35(59.3)	0.501*
	No	24 (47.1)	24(40.7)	
Numbness or paresthesia in upper medial arm	**Yes**	45(88.2)	53(89.8)	0.789*
	No	6(11.8)	6(10.2)	
Numbness and paresthesia in axilla	**Yes**	23(45.1)	19(32.2)	0.165*
	No	28(54.9)	40(67.8)	
Total		51(100.0)	59(100.0)	
Chi square test;Fisher Exact test*				

Table 4 shows that 6% of postoperative cases experienced skin flap necrosis, 2% of them experienced wound dehiscence and none of them had muscle paralysis or hemorrhage.

Table 4: Post-operative skin flap necrosis, wound dehiscence, Muscle paralysis and hemorrhage of patients.

Variables	Categories	Frequency	Percent
Skin flap necrosis	Yes	7	6%
	No	103	94%
Wound dehiscence	Yes	2	2%
	No	108	98%
Muscle paralysis	Yes	0	0%
	No	110	100%
Hemorrhage	Yes	0	0%
	No	110	100

DISCUSSION

We enrolled 110 women diagnosed with breast cancer in our study, that the majority (86.4%) of women were married and 13.6% of them were single, 17.3% of cases were smokers, 15.5% of patients DM, only 6.4% of cancer cases received radiotherapy before surgery while most (71.8%) of them received radiotherapy after surgery followed by 11.8% of them received chemotherapy before surgery while majority (84.5%) of patients reported chemotherapy postoperatively and the same amount (84.5%) of cases received hormonal treatment postoperatively.

In this study; 6.4% of them received antibiotic for infection, 13.6% of participants used NACT, nearly half (46.4%) of cases had first stage followed by 22.7% were in the second stage and 28.2% of them went through third stage of breast cancer, the majority diagnosed with ductal carcinoma while minority diagnosed with lobular carcinoma. This consistent with previous research that showed a low incidence of surgical site infections in breast cancer surgeries.[5] This finding that 48% of the patients had first stage breast cancer is consistent with global trend.[6]

Moreover, (39.0%) of cases reported numbness in breast and chest axillary numbness in level III axillary clearance however only (17.6%) in level I, II. this is consistent with previous study that have reported with post-operative numbness as common complication of breast cancer surgery after axillary lymph node dissection.[7]

There was a significant statistically association between level of axillary clearance and history of pain in axilla, 43.5% of level I, II patients experienced the pain while 81.5% of all levels level of axillary clearance had pain in axilla, Chi square test was significant and p=0.000. The research found a significant statistical association between the level of axillary clearance and the history of pain in the axilla.[8]

This study suggests no significant association between level of axillary clearance and limited shoulder or arm movement and p-value was 0.413. Further research may be need to confirm these findings and investigate potentials factors contributing to this difference.[9]

This study suggests no significant relationship between the level of axillary clearance and post-operative seroma and lymphedema. Supported by other researches.[10, 11]

There was statistical non-significant association between level of axillary clearance and numbness or paresthesia in upper medial arm and axilla and p-value were (0.789, 0.165). Other study they prefer to preserve intercostobrachial nerve to avoid upper medial arm numbness.[12]

Post-operative complications after breast cancer surgery are common and can significantly impact patient's quality of life. This study found that (6.4%) of cases had skin flap necrosis. Consistent with previous research.[13] Wound dehiscence (1.8%) is another complication of breast cancer surgery in our study. Finally, we found that no cases had a significant hemorrhage and muscle paralysis.

CONCLUSION

The commonest cause of complications of axillary lymph node dissection in this study were the presence of seroma, lymph edema, paresthesia and numbness of upper arm. Also axillary lymph node dissection is recognized as effective as regional node disease.

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