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Management of Complications after Axillary Clearance in Breast Cancer

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Abstract: **Background:** Breast cancer is the most frequently diagnosed cancer in women worldwide with an estimated 1.67 million new cancer cases worldwide annually (25% of all cancers) with an incidence rate > twice that of colorectal cancer and cervical cancer, and about three times that of lung cancer. and is second only to lung cancer as a leading cause of cancer-related death. **Aim of the Work:** To evaluate and study different types of complications resulting post ALND and possible modalities that can minimize postoperative complications in female patients with cancer breast with axillary metastasis to get better prognosis and better life style. **Patients and Methods:** This was a prospective randomized clinical study that included 20 patients, with a diagnosis of early breast cancer (clinical stage I or II that were not fixed to the skin or muscle and if palpable ALNs; they weren't fixed to each other or to underlying structures, included patients with breast cancer operated in hospitals of ministry of health started in May 2017. **Results:** There was no statistically significant difference found between improved and not improved groups regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy Axilla status, Dissected axilla, regarding Surgery in the dominant arm, incision for axillary dissection, Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymph edema and No. of positive lymph nodes. **Conclusion:** Seroma formation, wound infection, paraethesia, pain and range of motion restriction were major early complications that were observe din few cases after modified radical mastectomy with axillary dissection.
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Keywords: Axillary Clearance - Breast Cancer - Axillary Lymph Node Dissection

1. Introduction

Breast cancer is the most common cancer in US women. Breast cancer is the second most common cause of death in US women, and the leading cause of premature mortality from cancer in women **(Smith et al., 2015).**

In Egypt, breast cancer represents the most common cancer among Egyptian females and constitutes 37% of all female cancers **(Omar, 2010).**

The diagnostic process of breast cancer is made by a combination of clinical assessment, radiological imaging and a tissue sample taken by either cytological or histological analysis that is called triple assessment **(Mack et al. 2009).**

Breast cancer can spread to the nearby lymph nodes in the axilla. The affected lymph nodes must be removed (dissection). This helps stop the cancer from spreading. Axillary lymph node dissection (ALND) is a procedure to remove these lymph nodes. Axillary lymph node dissection (ALND) frequently is performed as part of the surgical management of breast cancer as a therapeutic and prognostic index, but increasingly has been perceived as associated with significant complications **(Wetzig et al., 2017).**

The gold standard treatment for early breast cancer is based on conservative breast surgery which consists principally of complete primary breast tumor excision with accepted safety margin of normal-appearing breast tissue and assessment of axillary lymph nodes status (axillary lymphadenectomy) followed by postoperative adjuvant radiotherapy of the remaining breast tissue. This technique could decrease morbidity following standard modified radical mastectomy (MRM) and allow women with different forms of breast cancer to conserve their breasts **(Morrogh, 2010).**

The anatomic disruption caused by ALND may result in complications like seroma formation, wound infection, lymphedema, atrophy of pectoralis major muscle, restricted arm mobility, axillary web syndrome (AWS), neuralgia, wound indurations, hypertrophied scars and sinus formation. Pain is long-term complication it's believed to be related with the damage to the intercostabrachial nerve during surgery. This damage also restricts arm and shoulder movements **(Shukla, 2016).**

Complications of ALND may reduce life quality due to increased infection, wound complications, and need for revision surgeries, which increases the risk for morbidity. Extended hospital stay may be required which increases costs for the patient and healthcare system **(Greuter et al., 2017).**

Women with ALND complications complain of a reduced quality of life and tend to have higher rates of mental health problems, while shoulder stiffness and functional limitations in activities of daily living are also reported. Consequently, ALND complications has implications on the ability to work, and hence lead to high direct and indirect monetary costs **(Rogan et al., 2016).**

It is in the interest of the patient, the medical staff, the therapist and the insurance companies, to make the treatment as effective and as acceptable as possible **(Rogan et al., 2016).**

Aim Of The Work

The aim of our work is to evaluate and study different types of complications resulting post ALND and possible modalities that can minimize postoperative complications in female patients with cancer breast with axillary metastasis to get better prognosis and better life style.

2. Patients and Methods

Study subject:

This was a prospective randomized clinical study that included 20 patients, with a diagnosis of early breast cancer (clinical stage I or II that were not fixed to the skin or muscle and if palpable ALNs; they weren't fixed to each other or to underlying structures, included patients with breast cancer operated in hospitals of ministry of health started in May 2017.

Selection of the patients:

Inclusion criteria:

- Female patients with early operable breast cancer (stage I & II) who are candidate for breast cancer surgery.
- Female patients aged between 30 and 55 years.
- Female patients with BMI less than 40.

- **Exclusion criteria:**

- Female patients with breast cancer who are not candidate for breast cancer surgery.
- Extensive breast cancer stage (III & IV).
- Patients with bilateral breast cancer.
- Morbid obese patients BMI > 40.
- Previously irradiated breasts.
- Patients with chronic pain and chronic arm or shoulder pathology.
- Unavailability for follow-up 1 month after surgery.

Methodology:

All patients included in this study were seeking for medical advice in the breast clinic and subjected to:

1. **Clinical assessment:**

- **Complete history** with emphasizing on breast complaints in details:
  - Personal data and reproductive history.
  - Present history: mode of onset, duration, progress...etc.
  - Family history of similar conditions.
  - Menstrual history, contraception and lactation.
  - Previous surgical and medical problems.
  - Complaint: breast lump, axillary swelling, nipple discharge…etc.

Full Clinical examination:

General examination: including general condition, vital signs and presence of scars of pervious operations with great effort to exclude presence of distant metastasis.

Breast examination including:

- Examination of the breast (4 quadrants, nipple and areola).
- Breast mass (site, size, and fixation….etc).
- Examination of ipsilateral axilla.
- Examination of contralateral breast & axilla.
- Examination of both arms.
- Examination of cervical specially supraclavicular LNs.

2. **Laboratory assessment: (routine and general evaluation tests)**

- Complete blood count (CBC).
- Fasting blood sugar (FBS).
- HbA1C in diabetic patients.
- **Liver function tests:**
  - Alanine aminotransferase (ALT).
  - Aspartate aminotransferase (AST).
  - Prothrombin activity & INR.
  - Serum bilirubin (total & direct).
- **Kidney function tests:**
  - Blood urea nitrogen.
  - Serum creatinine.
  - ECG.

3. **Radiological assessment:**

Mammography of both breasts & axilla to detect and localize the breast mass and to evaluate the presence of other suspicious lesions in the other breast tissue with BIRADS scoring.

4. **Pathological assessment:** Preoperative needle biopsy either true cut needle biopsy or FNAC.

5. **Metastatic work up:**

- Chest x ray.
- Abdominal and pelvic US.
- Bone scan or skeletal survey.

6. **Consent:**

All patients signed an informed written consent for the procedure before being submitted.

7. **Photographs:**

Standard digital color photographs. An informed consent of the patients obtained to have the photographs.

Pre-operative planning:

The best choice of operative technique in breast cancer surgery depends on elements related to the tumor location, characteristics of the breast and clinical evaluation of the patient.

Patients selection were done by the surgeon at the preoperative visit where exclusion criteria could be excluded from all patients.

All the patients were hospitalized at the night before surgery and undergo surgery at the next day. Patients discharged 24 hours after surgery with the permission of the surgeon & the anesthesiologist.

Surgical Procedures:

A single dose of intravenous antimicrobial prophylaxis was administered within 60 minutes prior to the surgery to ensure adequate drug tissue levels at the time of initial incision.

All surgical procedures were performed under general anesthesia.

All patients were operated upon with wide local excision and ALND through a separate axillary incision or from the same breast incision whenever possible.

Operative steps:

- The patient is positioned supine, tilted away from the surgeon, with her arms extended on arm boards at $\leq 90^{o}$ abduction from the chest wall.
- Resection of the primary breast tumor with accepted safety margin 2 cm of normal-appearing breast tissue (wide local excision, extended segmental excision or quadrantectomy) was systematically performed through an indirect periareolar, paraareolar or infra mammary skin incision.
- ALND performed (from the same breast incision whenever possible) or through a separate curvilinear incision is made approximately 1 - 2 cm below the edge of the axillary hair line following the natural skin crease (Langer's lines), extending from the anterior to the posterior axillary fold (from just below the free edge of the pectoral muscle anteriorly to the latissimus dorsi posteriorly and did not cross either of these structures).
- If the axillary space is wide, a transverse incision in this space provides adequate exposure; while if the axilla is narrow, the ends of incision were curved superiorly parallel to the muscles resulting in a U-shaped incision.
- The full thickness of the skin & underlying subcutaneous tissue are divided and skin hooks or rake retractors used to retract the superior & inferior aspects of the wound.
- The clavipectoral fascia was identified and incised longitudinally at the midpoint of its lower border in upward direction.
- This will end up with clavipectoral fascia being divided into lateral & medial leaflet.
- After the specimen is removed, the axilla was closed by means of the padding technique or by the use of a drain.
- In axillary padding technique identification of lateral & medial leaflets of the clavipectoral fascia was done and that was aided by the already present two stay sutures at the midpoint of the lower border of the clavipectoral fascia.
- Axillary padding consisted of suturing the edges (lateral & medial leaflet) of the incised axillary aponeurosis (clavipectoral fascia) to the regional muscles with the use of 3 separate stitches of absorbable thread (2.0 polyglactin stitches) that kept untied till the end of the procedure:
  - The first stitch sewed the lateral leaflet to the lateral edge of the pectoralis major muscle then to the medial leaflet.
  - The second stitch sewed the lateral leaflet to the serratus anterior muscle then to the medial leaflet.
  - The third stitch sewed the lateral leaflet to the latissimus dorsi muscle then to the medial leaflet.

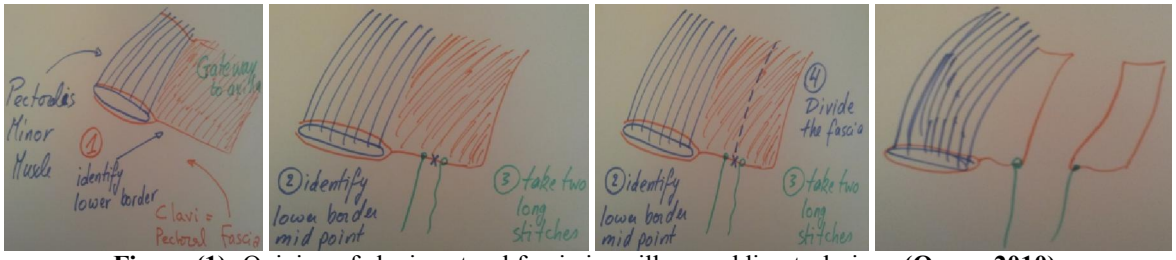

Figure (1): Opining of clavi pectoral fascia in axillary padding technique **(Omar, 2010).**

- Or the clavipectoral fascia was identified and incised longitudinally along the length of the pectoralis major at the level of the inferior axillary sheath to expose the underlying fat pad and ALNs within the fat.
- Dissection started with incision of the clavipectoral fascia and identification of the lateral border of pectoralis minor and the inferior border of axillary vein.

- The axillary vein then was traced laterally to the thoracodorsal complex with careful preservation of the nerve.
- Dissection was turned directly medially to the chest wall where the long thoracic nerve descends to the serratus anterior.
- Often, several branches of the intercostobrachial nerve were identified superficially during axillary dissection.
- The extent of axillary dissection was to the axillary vein superiorly, the medial border of pectoralis minor medially, the level of the fourth intercostal space inferiorly and the border of latissimus dorsi laterally, with preservation of the thoracodorsal neurovascular bundle, long thoracic and if possible intercosto brachial nerves.
- A level I and II ALND was performed in all patients with a combination of blunt and careful sharp dissection.
- An effort made to ligate the small vessels and major lymphatic vessels to reduce the risk of seroma and/or hematoma formation.
- Electrocautery was not used for dissection of skin flaps but was applied to cauterize small bleeding points.
- After the specimen is removed, the wound is irrigated with warm saline, and proper & meticulous haemostasis is obtained.
- A conventional single 16-Fr vacuum (closed suction) drain inserted into the axilla through a separate stab wound in the low axilla inferior to the incision above the bra line.
- The axillary incision was closed with closure of Scarpa's fascia by absorbable 3-0 Vicryl interrupted sutures.
- The skin was closed with 4-0 Monocryl continuous (running) subcuticular stitch or staples.
- Separate dressings were applied over the axillary and breast wounds.
- The excised axillary specimen and tumor specimen were sent to the pathologist to be examined and separated into level I and level II although in practical terms for post-operative decision making. The following data were to be reported upon (The pathological nature & the histological grading of the tumor, the number of LNs in axillary dissection specimen and the number of dissected axillary LNs affected by metastasis).

Postoperative care involves:

Pain control: According to analgesic ladder:

- First step. Mild pain: non-opioid analgesics such as nonsteroidal anti-inflammatory drugs (NSAIDs) or acetaminophen.
- Second step. Moderate pain: weak opioids (hydrocodone, codeine, tramadol) with or without non-opioid analgesics.
- Third step. Severe and persistent pain: potent opioids (morphine, methadone, fentanyl, oxycodone, buprenorphine, tapentadol, hydromorphone, oxymorphone) with or without non-opioid analgesics.

Figure (2): Axillary dissection through the same incision showing pectoralis major muscle and serratus anterior muscle

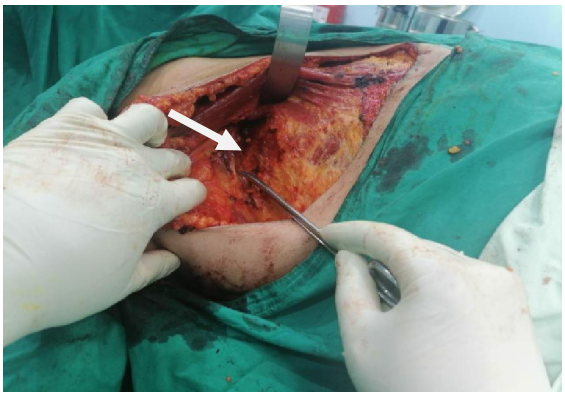

Figure (3): Axillary dissection through the same incision showing nerve to latissimus dorsi

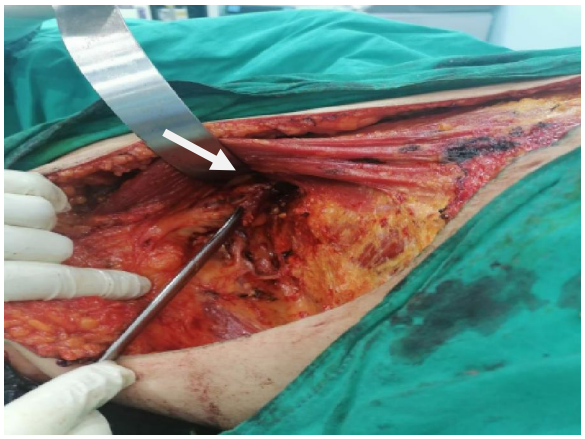

Figure (4): Axillary dissection through the same incision showing axillary vein.

Figure (5): Axillary dissection through the same incision showing nerve to serratus anterior.

Drinking and eating:

All patients were able to drink and eat when they awake again usually after 2 - 4 hours postoperatively.

Early patient mobility and simple range of motion exercises encouraged on the first post-operative day to resume full activity.

Patient discharge:

Patients were encouraged to leave the hospital after an observation period of 24 hours post operation.

- Patients were followed up clinically in the outpatient clinic.
- Patients may require physical therapy after the first week to regain full range of motion.
- Activity restrictions include avoidance of submersion of the incision in water and avoidance of driving, strenuous activity, or heavy lifting while the drain is in situ.
- Patients were discharged with the drain in situ and instructed on the care of the axillary drain at home and asked to keep a daily log of the drainage volume. The suction drain remained in situ for up to 14 days and could be removed at that time or earlier if the drainage flow had fallen to less than 50 ml for 2 consecutive days.
- Sutures were removed after 10-14 days.
- Follow-up of the pathologic specimen should be routine to determine adequacy of margins in the resection of the primary uniform policy tumor.

Figure (6): Axillary dissection through separate incision and closer with drain

Postoperative Follow-up: All patients were discharged after an observation period of 24 hours to be followed up clinically in the outpatient clinic for one month after surgery divided into five visits as follow:

- The first visit was at the 3rd postoperative day (first evaluation was made).
- The second visit was at 7th postoperative day.
- The third visit was at 10th postoperative day.
- The fourth visit was at 14th postoperative day (before the start of adjuvant chemo & radiotherapy).
- The fifth visit was at one month after surgery (the final follow-up for the purposes of this study).

All patients during each post-operative visit should assess and evaluate the following:

- Post operative pain & analgesia requirement.
- Range of shoulder movement & resuming normal activities.
- Clinical examination of the wound and site of the drain to detect signs of inflammation and assess the healing process.
- Early post operative complications such as haematoma and wound infection (fever, hyperemia, tenderness, swelling and pyogenic discharge at the incision site).

- Clinical examination of the axilla to detect axillary cystic swellings (axillary seroma formation). It is considered appreciable if clinically detected or recurred after repeated aspiration or <80ml by axillary US.
- Axillary ultra- sonography was done in suspicious cases to confirm diagnosis of axillary seroma formation.
- Quality of life and Patient satisfaction. This assessment has been done through a survey of the patient's opinion postoperatively and their satisfaction of the outcome regard rapid recovery, resuming normal activities, the aesthetic outcome, absence of post operative complications and timely start of radiotherapy & adjuvant systemic therapy. They were kindly asked to express their degree of satisfaction (satisfied, or unsatisfied).

Postoperative complications: were reported for every case

Statistical Analysis:

Data were collected, revised, coded and entered to the Statistical Package for Social Science (IBM SPSS) version 20. The qualitative data were presented as number and percentages while quantitative data were presented as mean, standard deviations and ranges when their distribution found parametric.

The comparison between two groups with qualitative data were done by using **Chi-square test** and/or **Fisher exact test** was used instead of Chi-square test when the expected count in any cell was found less than 5.

The comparison between two independent groups with quantitative data and parametric distribution was done by using **Independent t-test.**

The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following:

- $P > 0.05$ = non significant (NS).
- $P < 0.05$ = significant (S).
- $P < 0.001$ = highly significant (HS).

3. Results

Table (1) shows that among the studied cases (n=20) there were 20 (100.0%) Non Smoking, and there were 15 (75.0%) Non Diabetic and 5 (25.0%) Diabetic, and there were 14(70.0%) Married, 3 (15.0%) Widowed, 2 (10.0%) Single and 1 (5.0%) Divorced, and there were 11 (55.0%) Menopausal status Pre and 9 (45.0%) Menopausal status Post with mean Age 44.45 and ± 7.42 SD and range (30 -55) and mean BMI 36.90 and ± 2.40 SD and range (32 - 40).

Table (1): Distribution of the studied cases according to Age, BMI, Smoking, HTN, Diabetic, Marital Status and Menopausal status

		No.= 20
Age	< 40	8 (40.0%)
	> 40	12 (60.0%)
	Mean ± SD	44.45 ± 7.42
	Range	30 – 55
BMI	Mean ± SD	36.90 ± 2.40
	Range	32 – 40
Smoking	No	20 (100.0%)
HTN	No	12 (60.0%)
	Yes	8 (40.0%)
Diabetic	No	15 (75.0%)
	Yes	5 (25.0%)
Marital Status	Married	14 (70.0%)
	Widowed	3 (15.0%)
	Single	2 (10.0%)
	Divorced	1 (5.0%)
Menopausal status	Pre	11 (55.0%)
	Post	9 (45.0%)

Table (2): Distribution of the studied cases according to Urea, Creat, Hb, Hct, Tlc, Plt, ALT, AST, ESR and HbA1c

		No.= 20
Urea	Mean ± SD	31.13 ± 20.42
	Range	10.6 – 85
Creat	Mean ± SD	0.80 ± 0.27
	Range	0.4 – 1.4
Hb	Mean ± SD	15.65 ± 2.45

		No.= 20
	Range	12 – 22
Hct	Mean ± SD	47.54 ± 8.16
	Range	34.7 – 66
Tlc	Mean ± SD	26.61 ± 68.19
	Range	8.2 – 316
Plt	Mean ± SD	255.72 ± 92.56
	Range	18.3 – 519
ALT	Mean ± SD	29.25 ± 13.09
	Range	9 – 45
AST	Mean ± SD	27.55 ± 14.04
	Range	8 – 45
ESR	Mean ± SD	85.20 ± 42.44
	Range	11 – 153
HbA1c	Mean ± SD	5.05 ± 0.45
	Range	4.3 – 6.1

The following table shows the average Urea, Creat, Hb, Hct, Tlc, Plt, ALT, AST, ESR and HbA1c conducted for all cases.

Table (3): Distribution of the studied cases according to Dominant arm

Dominant arm	**No.**	**%**
Left	3	15.0%
Right	17	85.0%

This table shows that among the studied cases (n = 20) there were 3 (15.0%) Dominant arm is Left, and there were 17 (85.0%) Dominant arm is Right.

Table (4): Distribution of the studied cases according to Tissue diagnosis, Pathologic tumor stage and Pathologic LN stage

		No.	**%**
Tissue diagnosis	Ductal	13	65.0%
	Labular	7	35.0%
Pathologic tumer stage	T1	5	25.0%
	T2	15	75.0%
Pathologic LN stage	No	7	35.0%
	N1	9	45.0%
	N2	4	20.0%

The previous table show that there was Tissue diagnosis Ductal 13 (65.0%) and Labular 7 (35.0%), and there was Pathologic tumer stage T1 5 (25.0%) and T2 15 (75.0%), and there was Pathologic LN stage No 7 (35.0%), N1 9 (45.0%) and N 2 4 (20.0%).

Table (5): Distribution of the studied cases according to Surgery, Surgery - evaluation interval, Radiation therapy and Chemotherapy

		No.= 20
Surgery	Conservative surgery	15 (75.0%)
	Mastectomy	5 (25.0%)
Surgery - evaluation interval	< 36	11 (55.0%)
	≥ 36	9 (45.0%)
	Mean ± SD	34.70 ± 5.31
	Range	25 – 45
Chemotherapy	No	2 (10.0%)
	Yes	18 (90.0%)

Table (6): Distribution of the studied cases according to Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection

		No.	%
Axilla status	Positive	11	55.0%
	Negative	9	45.0%
Dissected axilla	Left	11	55.0%
	Right	9	45.0%
Surgery in the dominant arm	No	11	55.0%
	Yes	9	45.0%
Incision for axillary dissection	Separate	8	40.0%
	The same as the breast's	12	60.0%

Table (7): Distribution of the studied cases according to Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes

		No.	%
Status of lymph nodes	Absence of metastases	10	50.0%
	At least one metastatic	10	50.0%
Mean positive lymph nodes	≥ 5	8	40.0%
	< 5	12	60.0%
Dissected lymph nodes	< 10	4	20.0%
	≥ 5	16	80.0%
Lymphedema	No	16	80.0%
	Yes	4	20.0%
	Using of compression therapy	2	50.0%
	Physiotherapy and manual drainage by massage	2	50.0%
No. of positive lymph nodes	1-3	2	50.0%
	4-9	1	25.0%
	10+	1	25.0%

Table (8): Distribution of the studied cases according to Mean dissected lymph nodes, Postoperative seroma, Postoperative hematoma, Postoperative infection, Paresthesia and Range-of-motion restriction

		No.= 20
Mean dissected lymph nodes	Mean ± SD	13.75 ± 4.31
	Range	7 – 20
Postoperative seroma	No	12 (60.0%)
	Yes	8 (40.0%)
	Aspiration	4 (50.0%)
	Seroma catheter	2 (25.0%)
	Conservative by icing the axilla	2 (25.0%)
Postoperative hematoma and subcutaneous bruising	No	19 (95.0%)
	Yes	1 (5.0%)
	Conservative by icing the axilla	1 (100.0%)
Postoperative infection	No	18 (90.0%)
	Yes	2 (10.0%)
	Antibiotic used	1 (50.0%)
	Depridement and daily dressing with antibiotic	1 (50.0%)
Paresthesia and post op.pain	No	9 (45.0%)
	Yes	11 (55.0%)
	Mild to moderate	8 (72.8%)
	Moderate to severe	3 (27.2%)
Range-of-motion restriction	No	18 (90.0%)
	Yes	2 (10.0%)
	Conservative by physical therapy	2 (100.0%)

Table (9): Comparison between Non Postoperative seroma (no. = 12) and Postoperative seroma (no. = 8) regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy

		Non Postoperative seroma No.= 12	Postoperative seroma No.= 8	Test value	P-value	Sig.
Surgery	Conservative surgery	8 (66.7%)	7 (87.5%)	1.111	0.292	NS
	Mastectomy	4 (33.3%)	1 (12.5%)			
Surgery–evaluation interval	Mean ± SD	13.92 ± 4.46	13.50 ± 4.38	0.206	0.839	NS
	Range	8 – 20	7 – 19			
Surgery – evaluation interval	< 36	5 (41.7%)	6 (75.0%)	2.155	0.142	NS
	≥ 36	7 (58.3%)	2 (25.0%)			
Chemotherapy	No	1 (8.3%)	1 (12.5%)	0.093	0.761	NS
	Yes	11 (91.7%)	7 (87.5%)			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy.

Table (10): Comparison between Non Postoperative seroma (no. = 12) and Postoperative seroma (no. = 8) regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection

		Non Postoperative seroma		Postoperative seroma		Test value*	P-value	Sig.
		No.	%	No.	%			
Axilla status	Negative	5	41.7%	4	50.0%	0.135	0.714	NS
	Positive	7	58.3%	4	50.0%			
Dissected axilla	Left	8	66.7%	3	37.5%	1.650	0.199	NS
	Right	4	33.3%	5	62.5%			
Surgery in the dominant arm	No	10	83.3%	1	12.5%	9.731	0.062	NS
	Yes	2	16.7%	7	87.5%			
Incision for axillary dissection	Separate	6	50.0%	2	25.0%	1.250	0.264	NS
	The same as the breast's	6	50.0%	6	75.0%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Axilla status, Dissected axilla, regarding Surgery in the dominant arm and Incision for axillary dissection.

Table (11): Comparison between Non Postoperative seroma (no. = 12) and Postoperative seroma (no. = 8) regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes

		Non Postoperative seroma		Postoperative seroma		Test value*	P-value	Sig.
		No.	%	No.	%			
Status of lymph nodes	Absence of metastases	5	41.7%	5	62.5%	0.833	0.361	NS
	At least one metastatic	7	58.3%	3	37.5%			
Mean positive lymph nodes	≥5	5	41.7%	3	37.5%	0.035	0.852	NS
	<5	7	58.3%	5	62.5%			
Dissected lymph nodes	<10	3	25.0%	1	12.5%	0.469	0.494	NS
	≥5	9	75.0%	7	87.5%			
Lymphedema	No	11	91.7%	5	62.5%	2.552	0.110	NS
	Yes	1	8.3%	3	37.5%			
No. of positive lymph nodes	1-3	0	0.0%	2	66.7%	4.000	0.135	NS
	4-9	1	100.0%	0	0.0%			
	10+	0	0.0%	1	33.3%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes.

Table (12): Comparison between Non Postoperative hematoma (no. = 19) and Postoperative hematoma (no. = 1) regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy

		Non Postoperative hematoma	Postoperative hematoma	Test value	P-value	Sig.
		No.= 19	No.= 1			
Surgery	Conservative surgery	14 (73.7%)	1 (100.0%)	0.351	0.554	NS
	Mastectomy	5 (26.3%)	0 (0.0%)			
Surgery - evaluation interval	Mean ± SD	13.42 ± 4.16	20 ± 0	-1.539	0.144	NS
	Range	7 – 20	20 – 20			
Surgery - evaluation interval	<36	11 (57.9%)	0 (0.0%)	1.287	0.257	NS
	≥ 36	8 (42.1%)	1 (100.0%)			
Radiation therapy	No	3 (15.8%)	0 (0.0%)	0.186	0.666	NS
	Yes	16 (84.2%)	1 (100.0%)			
Chemotherapy	No	1 (5.3%)	1 (100.0%)	9.474	0.072	NS
	Yes	18 (94.7%)	0 (0.0%)			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy.

Table (13): Comparison between Non Postoperative hematoma (no. = 19) and Postoperative hematoma (no. = 1) regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection

		Non Postoperative hematoma		Postoperative hematoma		Test value*	P-value	Sig.
		No.	%	No.	%			
Axilla status	Negative	8	42.1%	1	100.0%	1.287	0.257	NS
	Positive	11	57.9%	0	0.0%			
Dissected axilla	Left	10	52.6%	1	100.0%	0.861	0.353	NS
	Right	9	47.4%	0	0.0%			
Surgery in the dominant arm	No	10	52.6%	1	100.0%	0.861	0.353	NS
	Yes	9	47.4%	0	0.0%			
I ncision for axillary dissection	Separate	7	36.8%	1	100.0%	1.579	0.209	NS
	The same as the breast's	12	63.2%	0	0.0%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection.

Table (14): Comparison between Non Postoperative hematoma (no. = 19) and Postoperative hematoma (no. = 1) regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes

		Non Postoperative hematoma		Postoperative hematoma		Test value*	P-value	Sig.
		No.	%	No.	%			
Status of lymph nodes	Absence of metastases	10	52.6%	0	0.0%	1.053	0.305	NS
	At least one metastatic	9	47.4%	1	100.0%			
Mean positive lymph Nodes	≥ 5	8	42.1%	0	0.0%	0.702	0.402	NS
	< 5	11	57.9%	1	100.0%			

Dissected lymph Nodes	< 10	4	21.1%	0	0.0%	0.263	0.608	NS
	≥ 5	15	78.9%	1	100.0%			
Lymphedema	No	15	78.9%	1	100.0%	0.263	0.608	NS
	Yes	4	21.1%	0	0.0%			
No. of positive lymph Nodes	1-3	2	50.0%	0	0.0%	NA	NA	–
	4-9	1	25.0%	0	0.0%			
	10 +	1	25.0%	0	0.0%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes.

Table (15): Comparison between Non Postoperative infection (no. = 18) and Postoperative infection (no. = 2) regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy

		Non Postoperative infection	**Postoperative infection**	**Test value**	**P-value**	**Sig.**
		No.= 18	**No.= 2**			
Surgery	Conservative surgery	13 (72.2%)	2 (100.0%)	0.741	0.389	NA
	Mastectomy	5 (27.8%)	0 (0.0%)			
Surgery - evaluation interval	Mean ± SD	35.00 ± 5.13	32.00 ± 8.49	0.749	0.464	NS
	Range	25 – 45	26 – 38			
Surgery – evaluation interval	< 36	10 (55.6%)	1 (50.0%)	0.022	0.881	NA
	≥ 36	8 (44.4%)	1 (50.0%)			
Chemotherapy	No	1 (5.6%)	1 (50.0%)	3.951	0.057	NA
	Yes	17 (94.4%)	1 (50.0%)			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy.

Table (16): Comparison between Non Postoperative infection (no. = 18) and Postoperative infection (no. = 2) regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection

		Non Postoperative infection		**Postoperative infection**		**Test value***	**P-value**	**Sig.**
		No.	**%**	**No.**	**%**			
Axilla status	Negative	8	44.4%	1	50.0%	0.022	0.881	NA
	Positive	10	55.6%	1	50.0%			
Dissected axilla	Left	10	55.6%	1	50.0%	0.022	0.881	NA
	Right	8	44.4%	1	50.0%			
Surgery in the dominant arm	No	10	55.6%	1	50.0%	0.022	0.881	NA
	Yes	8	44.4%	1	50.0%			
Incision for axillary dissection	Separate	6	33.3%	2	100.0%	3.333	0.068	NA
	The same as the breast's	12	66.7%	0	0.0%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection.

Table (17): Comparison between Non Postoperative infection (no. = 18) and Postoperative infection (no. = 2) regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes

		Non Postoperative infection		Postoperative infection		Test value*	P-value	Sig.
		No.	%	No.	%			
Status of lymph nodes	Absence of metastases	8	44.4%	2	100.0%	2.222	0.136	NA
	At least one metastatic	10	55.6%	0	0.0%			
Mean positive lymph nodes	≥5	7	38.9%	1	50.0%	0.093	0.761	NA
	<5	11	61.1%	1	50.0%			
Dissected lymph nodes	<10	4	22.2%	0	0.0%	0.556	0.456	NA
	≥5	14	77.8%	2	100.0%			
Lymphedema	No	14	77.8%	2	100.0%	0.556	0.456	NA
	Yes	4	22.2%	0	0.0%			
No. of positive lymph nodes	1-3	2	50.0%	0	0.0%	NA	NA	-
	4-9	1	25.0%	0	0.0%			
	10+	1	25.0%	0	0.0%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymph edema and No. of positive lymph nodes.

Table (18): Comparison between Non Paresthesia (no. = 9) and Paresthesia (no. = 11) regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy

		Non Paresthesia	Paresthesia	Test value	P-value	Sig.
		No.= 9	No.= 11			
Surgery	Conservative surgery	7 (77.8%)	8 (72.7%)	0.067	0.795	NS
	Mastectomy	2 (22.2%)	3 (27.3%)			
Surgery - evaluation interval	Mean ± SD	34.22 ± 4.84	35.09 ± 5.87	-0.355	0.726	NS
	Range	25 – 40	26 – 45			
Surgery - evaluation interval	<36	5 (55.6%)	6 (54.5%)	0.002	0.964	NS
	≥ 36	4 (44.4%)	5 (45.5%)			
Chemotherapy	No	0 (0.0%)	2 (18.2%)	1.818	0.178	NS
	Yes	9 (100.0%)	9 (81.8%)			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy.

Table (19): Comparison between Non Paresthesia (no. = 9) and Paresthesia (no. = 11) regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection

		Non Paresthesia		Paresthesia		Test value*	P-value	Sig.
		No.	%	No.	%			
Axilla status	Negative	3	33.3%	6	54.5%	0.900	0.343	NS
	Positive	6	66.7%	5	45.5%			
Dissected axilla	Left	6	66.7%	5	45.5%	0.900	0.343	NS
	Right	3	33.3%	6	54.5%			
Surgery in the dominant arm	No	6	66.7%	5	45.5%	0.900	0.343	NS
	Yes	3	33.3%	6	54.5%			
Incision for axillary dissection	Separate	4	44.4%	4	36.4%	0.135	0.714	NS
	The same as the breast's	5	55.6%	7	63.6%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection.

Table (20): Comparison between Non Paresthesia (no. = 9) and Paresthesia (no. = 11) regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes

		Non Paresthesia		Paresthesia		Test value*	P-value	Sig.
		No.	%	No.	%			
Status of lymph nodes	Absence of metastases	3	33.3%	7	63.6%	1.818	0.178	NS
	At least one metastatic	6	66.7%	4	36.4%			
Mean positive lymph nodes	≥ 5	4	44.4%	4	36.4%	0.135	0.714	NS
	< 5	5	55.6%	7	63.6%			
Dissected lymph nodes	< 10	3	33.3%	1	9.1%	1.818	0.178	NS
	≥ 5	6	66.7%	10	90.9%			
Lymphedema	No	7	77.8%	9	81.8%	0.051	0.822	NS
	Yes	2	22.2%	2	18.2%			
No. of positive lymph nodes	1-3	0	0.0%	2	100.0%	4.000	0.135	NS
	4-9	1	50.0%	0	0.0%			
	10 +	1	50.0%	0	0.0%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes.

Table (21): Comparison between Non Range-of-motion restriction (no. = 18) and Range-of-motion restriction (no. = 2) regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy

		Non Range-of-motion restriction	Range-of-motion restriction	Test value	P-value	Sig.
		No.= 18	No.= 2			
Surgery	Conservative surgery	13 (72.2%)	2 (100.0%)	0.741	0.389	NS
	Mastectomy	5 (27.8%)	0 (0.0%)			
Surgery - evaluation interval	Mean ± SD	14.39 ± 7.56	40.50 ± 6.38	2.172	0.063	NS
	Range	30 – 55	36 – 45			
Surgery - evaluation interval	<36	9 (50.0%)	2 (100.0%)	1.818	0.178	NS
	≥ 36	9 (50.0%)	0 (0.0%)			
Chemotherapy	No	2 (11.1%)	0 (0.0%)	0.247	0.619	NS
	Yes	16 (88.9%)	2 (100.0%)			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy.

Table (22): Comparison between Non Range-of-motion restriction (no. = 15) and Range-of-motion restriction (no. = 5) regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection

		Non Range-of-motion restriction		Range-of-motion restriction		Test value*	P-value	Sig.
		No.	%	No.	%			
Axilla status	Negative	7	38.9%	2	100.0%	2.716	0.099	NS
	Positive	11	61.1%	0	0.0%			
Dissected axilla	Left	9	50.0%	2	100.0%	1.818	0.178	NS
	Right	9	50.0%	0	0.0%			
Surgery in the dominant arm	No	9	50.0%	2	100.0%	1.818	0.178	NS
	Yes	9	50.0%	0	0.0%			
Incision for axillary dissection	Separate	8	44.4%	0	0.0%	1.481	0.224	NS
	The same as the breast's	10	55.6%	2	100.0%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Axilla status, Dissected axilla, Surgery in the dominant arm and Incision for axillary dissection.

Table (23): Comparison between Non Range-of-motion restriction (no. = 15) and Range-of-motion restriction (no. = 5) regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes

		Non Range-of-motion restriction		Range-of-motion restriction		Test value*	P-value	Sig.
		No.	%	No.	%			
Status of lymph nodes	Absence of metastases	8	44.4%	2	100.0%	2.222	0.136	NS
	At least one metastatic	10	55.6%	0	0.0%			
Mean positive lymph nodes	≥ 5	7	38.9%	1	50.0%	0.093	0.761	NS
	< 5	11	61.1%	1	50.0%			
Dissected lymph nodes	< 10	2	11.1%	2	100.0%	8.889	0.063	NS
	≥ 5	16	88.9%	0	0.0%			
Lymphedema	No	15	83.3%	1	50.0%	1.25	0.264	NS
	Yes	3	16.7%	1	50.0%			
No. of positive lymph nodes	1-3	1	33.3%	1	100.0%	1.333	0.513	NS
	4-9	1	33.3%	0	0.0%			
	10 +	1	33.3%	0	0.0%			

P-value > 0.05: Non significant (NS); P-value < 0.05: Significant (S); P-value < 0.01: highly significant (HS)
*:Chi-square test; •: Independent t-test

The Previous table shows that there was non statistically significant difference found between two groups regarding Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes.

4. Discussion

Breast cancer is the most common cancer in women worldwide. The employment of multimodality tests preoperatively for diagnosis helps in differentiating benign from malignant lesions. The primary goal of the triple test is to make the correct preoperative diagnosis, avoiding open biopsy in case of a benign breast lump. The present study tries to evaluate the accuracy of multimodality tests, that is, CBE, US, and FNAC together, keeping HPE of breast lump (s) as the reference standard **(Wetzig et al., 2017).**

The commonest mode of presentation of diseases of the breast is "lump." A palpable mass in a woman's breast could be a benign or malignant lesion and it requires a prompt evaluation. Correct preoperative diagnosis of a breast lesion is essential for optimal treatment planning **(Evans et al., 2015).**

The modern approach to the breast cancer management is multidisciplinary. The surgical treatment for the breast cancers depends upon the stage of disease at the time of initial presentation, age of patients, patient's preference and surgeon's choice. Among the procedures, modified radical mastectomy with axillary clearance is the most commonly performed surgery **(Czajka and Pfeifer, 2020).**

Our study showed that among the studied cases (n=20) there were 20 (100.0%) Non Smoking, and there were 15 (75.0%) Non Diabetic and 5 (25.0%) Diabetic, and there were 14 (70.0%) Married, 3 (15.0%) Widowed, 2 (10.0%) Single and 1 (5.0%) Divorced, and there were 11 (55.0%) Menopausal status Pre and 9 (45.0%) Menopausal status Post with mean Age 44.45 and ± 7.42 SD and range (30 -55) and mean BMI 36.90 and ± 2.40 SD and range (32 - 40). For the dominant arm among the studied cases (n=20) there were 3 (15.0%) Dominant arm was left, and there were 17 (85.0%) Dominant arm was the right one.

Our study showed that there was Tissue diagnosis Ductal 13 (65.0%) and Labular 7 (35.0%), and there was Pathologic tumer stage T1 5 (25.0%) and T2 15 (75.0%), and there was Pathologic LN stage No 7 (35.0%), N1 9 (45.0%) and N2 4 (20.0%).

Among the studied patients, 75% went through conservative surgery and mastectomy was done for only 25% of patients. For chemotherapy, 90% of our patients received chemotherapy and 10% didn't receive chemotherapy.

Currently, conservative surgery combined with breast chemotherapy is considered as effective as total mastectomy for the local control of breast cancer. Previous studies have shown that the type of treatment used influences the morbidity prevalence.

Schünemann and Willich (1997) evaluated 5,868 patients with breast cancer treated from 1972 to 1995 and demonstrated that the addition of radiotherapy to modified radical mastectomy increased the lymphedema incidence from 19.1% to 28.9%. **DiSipio et al. (2013),** in a systematic review and meta-analysis that evaluated 72 studies, associated chemotherapy with lymph edema.

In our study, as regard post-operative complications, 20% of patients developed lymphedema while 80% didn't develop lymphemdema.

Lymphedema, the most serious and difficult-to-treat complication, occurred in nine patients (9.4%) in **Chen (2012)** study and this finding is less than that mentioned in other studies **(Roses et al., 1999).** The variation in incidence of lymphedema could be due to great variability in procedures, radiation treatments, objective assessment criteria, and duration of follow-up. Incidence of lymphedema seemed to increase with time up to 2 years after diagnosis or surgery, after which incidence seemed to decrease.

In our study, as regard the post-operative complications, 40% of patients developed postoperative seroma that was treated through aspiration (50%), Seroma catheter (25%) and Conservative by icing the axilla (25%).

Despite the use of postoperative closed suction drainage to minimize prolonged seroma formation, we found that 40% of patients developed seroma after the discontinuance of the drain and 14% in **Mohaned et al. (2018)** developed seroma after surgery.

Woodworth et al. (2000) in his study showed that the most common complication in this study was seroma formation which was observed in 38 (38%) patients and found that this complication can be prevented by insertion of suction drain deep to mastectomy flaps in the axilla and found that the incidence of seroma has been shown to correlate with patient's age, breast size, presence of malignant nodes in the axilla, previous surgical biopsy, hypertension and use of heparin. All of our patients ultimately recovered on repeated aspirations.

As regard the postoperative hematoma and subcutaneous bruising, 95% didn't develop hematoma and 5 % developed hematoma that was treated through icing the axilla.

According to the post-operative infection, 90% didn't develop infection and 10% developed infection that was treated through use of antibiotics (50%), debridement and daily dressing with antibiotics (50%)

The wound infection is commonly due tonosocomial or hospital acquired organism. The factors contributing the wound infections are fluid collection, wound separation and smoking. Staphylococcus aureus was the most common causative organism, the other organism being pseudomonas aeroginosa **(Bokhari and Iram, 2010).** In a study by **Hoffman (2002),** patients with wound infection were treated by antibiotics according to culture and sensitivity report and sterilized daily dressing.

For paresthesia and post-operative pain, 55% of the patients developed paresthesia and pain; 72.8% developed mild to moderate pain and 27.2% developed moderate to severe pain but on the other hand 45% of the patients didn't suffer from post-operative pain.

To support our results, **Mohaned et al. (2018)** showed that paresthesia was the most frequent complication in his study and was found in 20% of patients compared with 35% to 68% reported in other studies **(Warmuth et al. 1998 and Veronesi et al., 2003).** Paresthesia is related to the intercostobrachial nerve section that crosses the axilla and is transected during ALND. The low incidence found in this study could be due to difficulty in assessing paresthesia after axillary dissection in the immediate postoperative period and paresthesia does not limit quality of life in most patients, and many patients will not complain about it.

As regard the range-of-motion restriction, 90% didn't develop the range of motion restriction that was treated by Conservative by physical therapy and 10% didn't developed restriction of the motion.

Kootstra et al. (2013) evaluated 76 women and observed that 70% had clinical relevant impairments in the shoulder and arm 7 years after ALND. It is noteworthy that 62.5% (n = 30) of patients who presented with range-of-motion restriction (n = 48) had only mild range-of-motion restriction (120° to 179° abduction).

In our study there was no statistically significant difference found between improved and not improved groups regarding Surgery, Surgery - evaluation interval, Surgery - evaluation interval and Chemotherapy Axilla status, Dissected axilla, regarding Surgery in the dominant arm, incision for axillary dissection, Status of lymph nodes, Mean positive lymph nodes, Dissected lymph nodes, Lymphedema and No. of positive lymph nodes.

Conclusion

Seroma formation, wound infection, paraethesia, pain and range of motion restriction were major early complications that were observe din few cases after modified radical mastectomy with axillary dissection.

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