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Assessment Study in Breast Conservative surgery in Locally Advanced Breast Cancer after Good Response to Neoadjuvant Chemotherapy

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ABSTRACT

Background: Locally advanced breast cancer [LABC] defines the most advanced stage of non-metastatic breast cancer. The neo-adjuvant chemotherapy [NACT] aims to permit removal of LABC by surgery. Breast conservative surgery describes the effective removal of the tumor with preservation of the breast appearance. However, in some cases, the achievement of both goals is difficult.

Aim of the work: This study designed to evaluate the results of the conservative breast surgery in cases of LABC following a favourable outcome from NACT.

Patients and Methods: This study was carried out in Surgical-Oncology Department, Sayed Galal Hospital and included females with LABC. All women were evaluated by history taking, clinical examination and radiological investigations. Then all were submitted to conservative breast surgery after assessment of neoadjuvant chemotherapy. The surgical and aesthetic outcomes were recorded and any complications were documented.

Results: The family history was positive for 20%. Most patients were on oral contraceptive pills and primipara. The most prevalent site was upper outer quadrant [UOQ] and 80% of patients showed partial response [PR], 16% showed complete response [CR] and 4% showed stationary disease [SD]. The outcome was excellent for 84% of the patients according to Cosmetic outcome distribution

Conclusion: Patients with LABC after NACT had great response with successful outcome from difference perspectives. Thus, neo-adjuvant chemotherapy followed by breast conservation surgery is a reasonable option for LABC treatment.

Keywords: Breast Cancer; Conservative Surgery; Neoadjuvant Chemotherapy; Cosmetic.

INTRODUCTION

Breast cancer is a site-specific tumour. It is the commonest cancer in women, which represents 33% of all malignancies affected females aged 20 to 59 years. It is responsible to about 20% of cancer- related fatalities in women [1-3].

In Egypt, for example, breast cancer accounts for 37.7% of all cancers registered for older women and about 12621 new cases were recorded in 2008, and it is the largest cause of cancer-related fatalities [29.1% of the total]. It is estimated to affect 46000 women by the year 2050 [4, 5].

Recent decades witnessed increasing progress of breast cancer surgery. It was transferred from extremely drastic, life-threatening surgeries to less invasive procedures and from disfiguring to present conserving with excellent reconstruction [6].

In addition, the introduction of neoadjuvant chemotherapy [NACT] making inoperable to operable tumor, especially for locally advanced breast cancer [LABC]. Breast conserving surgery become possible after NACT [7-9].

In these patients, NACT may provide a suitable treatment option of the disease which is not achievable with surgery alone. In some cases, the achievement of total excision with safety margin and preserving breast may be difficult [10].

In this study, conservative breast surgery for locally advanced breast cancer that had shown a favourable response to neoadjuvant treatment was evaluated.

PATIENTS AND METHODS

This was a prospective observational study. It was carried out in the Surgical-Oncology Department, Sayed Galal Hospital [Al-Azhar University, Cairo, Egypt]. It included 25 women with locally advanced breast cancer. A written informed consent was obtained from the patients after each patient received a full explanation of the study, its aims and their privacy were assured. The study was completed between first of June 2022 to the end of November 2022.

Inclusion criteria: we included all women with complete resolution of the skin edema, with a tumor size < 5 cm, no signs of multicentric malignancy, no prior radiation to the chest or breast wall, no systemic diseases or substantial lymph node involvement, widespread micro-calcification, and intraoperatively attained negative operative margins.

Exclusion criteria: Patients with inflammatory or metastatic or early-stage breast cancer were excluded. In addition, we excluded those with no response to chemotherapy or preoperative radio-therapy. Furthermore, patients with skin disease [breast or systemic], women older than 60 years, and women with metastatic cancers, and women systemic diseases interfering with prolonged anesthesia were excluded.

The clinical assessment consisted of history taking, clinical examination, laboratory and radiological evaluations. The history aimed to determine the disease severity, duration, search for potential risk factors [e.g., menopause, hormonal therapy, parity and breasting feeding].

The clinical examination was performed in a systematic manner [i.e., inspection and palpation]. Inspection was performed while the woman put her hands on her hips and the arms were straight up in the air [both with and without pectoral muscle contraction]. Special attention was paid to the examination of nipples and palpation was performed to detect any masses or cystic structures.

As MRI created precise images of the body using magnetic fields rather than x-rays, it was performed for all women, and a contrast medium was injected to produce clear images of the potential tumour. Finally, a biopsy from the tumour was extracted to determine the type of the tumour. This helped in planning of treatment. The biopsy was guided by ultrasound to ensure that the biopsy was obtained from the right location. If the tumour not apparent on ultrasound, mammo-graphy or MRI were used to guide the biopsy.

Neoadjuvant chemotherapy was administered. The night before surgery, the patients were subjected to a pre-anaesthetic assessment and patient was instructed to abstain foods all the night before surgery. The axillary hair was shaved. During the anaesthetic induction, a single preventive antibiotic dose was administered intravenously.

The procedure was a conservative breast surgery. This included a frozen portion performed intra-operatively. The follow up was performed at one week, two weeks and one month after surgery. Then, regular clinical follow up was performed every two months in the follow up period.

mammography, sonography and magnetic resonance imaging [MRI] was performed for both breasts.

Statistical analysis of data: The data fed to IBM SPSS for analysis, version 22 [SPSS Inc, Chicago, IL]. Relative frequency and percentages were used to portray the quantitative data, while mean and standard deviation were used to depict the quantitively data.

RESULTS

The present study included 25 women. Their age ranged between 34 and 60 years [the mean age was 48.52 years. The majority of patients were in the fourth decade [48%] followed by the sixth decade [28.0%]. The mean body mass index was 25.75 ± 2.64 kg/m^2 and the majority of them were from rural area [56.0%]. Finally, 20% of cases had positive family history for breast cancer [Table 1].

Regarding tumor characteristics, the majority were on the right breast [56.0%], and the upper outer quadrant was the commonest site [36.0%] followed by lower outer quadrant [28.0%]. Histopathologically, the commonest variant was infiltrating ductal carcinoma [80.0%], and the commonest from hormonal receptor side was luminal A [ER, PR, HER-] [80.0%] and safety margin was negative in all cases. The tumor size ranged between 1 and 4.2 cm, the mean size was 2.67 cm. Finally, and 80% of patients showed partial response [PR], 16% showed complete response [CR] and 4% showed stationary disease [SD] [Table 2].

Regarding tumor staging, the commonest clinical stage was T 3 [68.0%], and the commonest clinical lymph node stage was N1 [72.0%]. The commonest tumor stage was 2B [60.0%] and N staging was positive in 76% [Table 3].

Regarding outcome, the preoperative complications were reported in 10 females [3 wound infection, 5 seroma and 2 hematomas]. All were mild and treated conservatively. The cosmetic outcome was excellent among 84%, good for 12% and fair in 4%. No poor cosmetic outcome was recorded. The patient satisfaction was very satisfied among 80.0% and satisfied among 12% [Table 4].

Table [1]: Patient characteristics

Variables		Measures
Age [years]	Mean ± SD	48.52 ± 7.82
	Min. – Max.	34 - 60
Age group [n, %]	30 – 40 years	12 [48%]
	41 – 50 years	6 [24%]
	> 50 years	7 [28%]
Body mass index [kg/m^2]	Mean ± SD	25.75 ± 2.64
Residence [n, %]	Rural	14 [56%]
	Urban	11 [44%]
Family history [n, %]	Positive	5 [20.0%]
	Negative	20 [80.0%]

Table [2]: Tumor characteristics

Variables		Measures
Side [n, %]	Right	14[56.0%]
	Left	11 [44.0%]
Site [n, %]	Upper outer quadrant	9 [36.0%]
	Lower outer quadrant	7 [28.0%]
	Upper inner quadrant	6 [24.0%]
	Lower inner quadrant	3 [12.0%]
Histopathology	Invasive lobular carcinoma	2 [8.0%]
	Infiltrating ductal carcinoma	20 [80.0%]
	Mixed	3 [12.0%]
Hormone receptor [n, %]	Luminal A [ER + PR + HER-]	20 [80.0%]
	Luminal B [ER + PR + HER+]	2 [8.0%]
	Triple negative [ER - PR – HER-]	2 [8.0%]
	HER2 positive [ER - PR - HER+]	1 [4.0%]
Safety margin [n, %]	Negative	25 [100.0%]
	Positive	0 [0.0%]
Pathological tumor size [cm]	Mean ± SD	2.67 ± 0.843
	Min. – Max.	1 – 4.2
Response to chemotherapy	Partial response	20 [80.0%]
	Complete response	4[16.0%]
	Stable disease	1 [4.0%]

Table [3]: Tumor stages among the studied patients

Variables		All patients [n=25]	
		No.	%
Clinical stage	**T1**	2	8%
	T2	2	8%
	T3	17	68%
	T4	4	16%
Clinical lymph node stage	**N0**	2	8%
	N1	18	72%
	N2	5	20%
Tumor stage	2B	15	60%
	3A	4	16%
	3B	6	24%
N staging	Negative	6	24%
	Positive	19	76%

Table [4]: Postoperative outcome among studied patients

Variables		All patients [n=25]	
		N	%
Complications	Wound infection	3	12%
	Seroma	5	20%
	Hematoma	2	8%
Cosmetic outcome [n, %]	Excellent	21	84%
	Good	3	12%
	Fair	1	4%
	Poor	0	--
Patient satisfaction [n, %]	Very satisfied	20	80%
	Satisfied	3	12%
	Neutral	1	4%
	Unsatisfied	1	4%

DISCUSSION

Breast cancer, the commonest tumour among women. The conservative breast treatment is safe and considered the standard treatment option for tumours up to five centimetres. The use of preoperative chemo- or hormonal treat to downgrade big tumours are recommended to maintain a clear margin and thus control the local recurrence rate [11].

The current work was designed to observe clinical outcome of conservative breast surgery after neoadjuvant chemotherapy for 25 women with locally advanced breast cancer. Their mean age was 48.52 years and the majority of them come from rural areas. The safety margin was negative in all subjects with mild postoperative complications that treated conservative. The cosmetic outcome was excellent among 84% of patients and patient satisfaction was very satisfied and satisfied among 80% and 12% respectively.

These results are comparable to **El Sisi *et al.*** [12] who included 50 patients with LABC who were submitted to breast conserving surgery and NAC. Their age ranged between 35 to 60 years with a mean value of 47.78 years. The mass was detected in UOQ in 23 patients [46%] and 12 patients [24%] were presented with breast mass in LOQ. In addition, 11 cases [22%] had postoperative seroma and wound infection reported in 4 patients [8%], while hematoma occurred in two cases [4%]. All women were assessed for cosmetic outcome by Harvard scale which revealed that 43 [86%] of them had excellent outcome and 4[8%] had good outcome. However, the rate of patient satisfaction in their study was lower than the current one. The excellent satisfaction [very satisfied] was reported by 54%, while satisfaction was recorded for 32 % and 10% had fair and 4% had poor satisfaction. This could be attributed to different inclusion criteria with different age distribution.

The results of the current work are also in line with **El-Sayed *et al.*** [13], study that stated that 20% of patients had N0, 55% of them had N1 and 25% of them had N2.

The tumor stage 2B was the commonest among studied populations [60%]. This result

agrees with **Shin *et al.*** [14] who demonstrated that 63.5% of patients presented with stage IIIA and close to the results of **Salem *et al.*** [15], who showed that, 57% of women had stage IIIA.

In the current work, seroma was the commonest complication and this agrees with **Ranisavljević *et al.*** [16] who reported that, seroma was seen in 10% and wound infection in 6%, irrespective of the fact that, the rate of seroma in the current study is double that of their study.

T3 was the common stage in the current work. This is was different than the study of **Parmar *et al.*** [17] who reported that 30.9% had T1-T3 and 69.1% had T4 lesion. But the results are close to **Sweeting *et al.*** [18] who demonstrated that 6% had T1, 24% had T2 lesion and 63% had T3 lesion.

The positive family history in the current work was recorded for 20.0% and this is in line with **Gabr Attia *et al.*** [19] as they reported that 20% of their included women had positive family history for breast cancer.

Response to chemotherapy showed that, 80% had PR, 16% had CR, and 4% had SD. In 84%, the patients' cosmetic look was excellent. However, there are no patients who had bad results. 80% of the patients said they were very satisfied, 12% said they were satisfied, 4. Our findings were supported by a study by **El Sisi et al.** [12] who discovered that stagnant disease occurred in 4% of patients while complete responses were observed in 14% of patients and partial responses in 82% of individuals. All cases were evaluated for cosmetic outcome, and 43 [86%] of them had excellent results. **Salem et al.** [15] study demonstrated that 9% had complete response, 79% had partial response, and 10% had stationary disease. Finally, results are comparable to **Rahman et al.** [20] study which revealed 18% had CR, 75% had PR, and 7% had SD.

This study offers new insights into the feasibility and outcomes of breast-conserving surgery in women with locally advanced breast cancer who achieved a significant response to neoadjuvant chemotherapy. By enrolling a specific cohort of 25 patients with ideal pre-operative features—including complete resolution of skin edema and intraoperatively confirmed negative margins—our research provides a focused evaluation of surgical safety and cosmetic outcomes in a demographic frequently overlooked in larger studies. Notably, we observed excellent cosmetic outcomes in 84% of cases and high patient satisfaction levels, with 80% reporting they were "very satisfied" following the procedure. These findings underscore the potential for breast-conserving surgery to be a viable option in this patient population, contributing valuable data to the ongoing debate about the management of locally advanced breast cancer post-chemotherapy. Additionally, our detailed assessment of surgical complications—primarily mild in nature—enhances the understanding of risks associated with this approach, paving the way for further exploration of tailored surgical strategies in similar cohorts.

Finally, we could conclude that, breast conservation after neoadjuvant chemotherapy is a safe and effective treatment option for LABC on the basis of surgical and cosmetic outcomes.

This work had many limitations. First the small number of included women. Second is the subjective evaluation of cosmetic outcome and the third limitation is the short term follow up time.

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