

On Postoperative Problems Following Mastectomy and Their Impact on Immediate Breast Reconstruction, Early Neoadjuvant and Adjuvant Chemotherapy

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ABSTRACT

Background: Chemotherapy plays a significant part in the management of breast cancer. In the current study, mastectomy with prompt breast reconstruction, the effects of neoadjuvant and adjuvant chemotherapy were investigated.

Objective: The effect of neoadjuvant and adjuvant were given systemically to breast cancer patients to investigate their effect on breast reconstruction following mastectomy.

Methods: Two-year postoperative follow-up at Zagazig University Surgical Department for 82 patients who received assistance systemic neoadjuvant (NAC) and (ACT) adjuvant chemotherapy for breast cancer between January 2021 and December 2022, together with mastectomy and rapid reconstructive surgery of the breast.

Results: During the trial, 82 patients received fast breast remodeling after mastectomy. 34 patients did not receive any systemic therapy, whereas 28 patients had preoperative chemotherapy and 20 patients received postoperative chemotherapy.

Conclusion: There were no differences in unscheduled reoperation, donor-site complications, or expander loss across the groups although the adjuvant chemotherapy group had a substantial number of wounds that were infected.

Keywords: Breast cancer, Mastectomy, Chemotherapy, Early reconstruction.

INTRODUCTION

To prevent the spread of the disease after surgical removal of breast cancer and to enhance cosmetic results, breast reconstruction (BR) is emerging as a novel treatment option. More than 18,000 women took part in the National Mastectomy and Breast Cancer Reconstruction Audit (NMBRA), which recently came to an end and examined a wide range of clinical and personal results, including death and survival. The evaluation also took into account important factors including information and access to reconstructive treatments, as well as the degree of pain, problems, living quality, and well-being suffering by women following different surgeries ⁽¹⁾.

Although women with breast cancer are now less likely to undergo a radical mastectomy, oncoplastic surgery is still a crucial component of breast cancer treatment, particularly for aggressive tumors that are more progressed or localized ⁽³⁾. Following tumor elimination, patients' psychosocial and aesthetically pleasing outcomes are enhanced, according to many studies ⁽²⁾. Immediate repair is safe from an oncological and surgical standpoint ⁽³⁾, with no difference in complications when versus delayed reconstruction ⁽⁴⁾. To find wounds and other negative effects, we completed the research collected with subjects of women who undergo this operation and the process of chemotherapy.

Modern breast cancer treatment strategies heavily rely on neoadjuvant chemotherapy ⁽⁶⁾. Females can be successfully operated with less extensive destructive surgeries with ACT and NAC therapy that have substantial benefits for both description and prognosis effect on breast malignancy ^(7,8). It further decreases the amount of recurrence in both the breast mass and the

axillary lymphatics. Long-term survival is anticipated by treatment response, but failing to adapt to the treatment can impact further chemotherapy options ^(9,10).

The timing of reconstruction may be impacted by the use of neoadjuvant chemotherapy ⁽¹¹⁾. Irradiation after mastectomy has been the subject of numerous studies, and sizable studies have revealed increased wound affection and cosmesis outcomes following mammary remodeling in patients receiving NACT ⁽¹²⁻¹³⁾. Neoadjuvant and adjuvant chemotherapy is effective in enhancing breast cancer oncologic outcomes and survival rates, but its impact on breast aesthetic results is less clear ⁽¹⁴⁻¹⁵⁾. Post-mastectomy reconstruction is now increasingly popular among patients as a result of the rise in the number of mastectomy procedures ⁽¹⁶⁻¹⁷⁾.

Inclusion criteria:

1- Patients fit for adjuvant and neoadjuvant therapy. 2- Patients fit for operation. 3- Operated non-metastatic cases.

Exclusions criteria: 1- Advanced metastatic cancer.

2- Unfit cases for surgery or any therapy.

METHODS

We had 82 female patients who regularly took prescription medications between January 2021 and December 2022. The age ranged from 25 to 72 years old. They underwent the procedures of mastectomy and reorganization over a 6-7 week period at Zagazig University Surgical Department. They were divided into three groups, group (20 cases) received adjuvant chemotherapy, group (34 cases) received chemotherapy, and group (28 affected cases) received neoadjuvant

chemotherapy. Patient information, current records, and treatment-related components were gathered. Recorded surgical outcomes and complications included difficulties with the wound, partial or complete skin flap and nipple decay, partial or complete loss of skin, infections, and problems with tissue expanders/implants as well as explanation of the breast and the majority of cancers outcomes. Also, antibiotics taken orally and systemically for the infectious issues were recorded and putting or wishing for readmission for any cause in the locality. Unexpected surgical procedures or reoperations were necessary for several reasons, including rectus diastasis after the reconstruction of a transverse rectus abdominis muscle flap, wound bleeding, wound infection, wound debridement for infections or destruction and expander or implant removal if a severe infection was present. For every event complication, an amazing range of issues have been obtained in the study. A breast healthcare expert or plastic healthcare express gathered complains about all postoperative troubles that took place, and they have been all protected in the study.

Adjuvant chemotherapy was the chemotherapy that was administered after mastectomy, whereas **neoadjuvant chemotherapy** was the chemotherapy that was administered before mastectomy with rapid reconstruction. Regardless of the condition, all patients who acquired postoperative chemotherapy have been assigned to the adjuvant group.

Ethical Consideration: This study was ethically approved by Zagazig University Academic and Ethical Committee. Written informed consents from all the participants or the participants' parents were obtained. The study protocol conformed to the

Helsinki Declaration, the ethical norm of the World Medical Association for human testing.

Statistical analysis

Utilizing R Statistical Software and the metaphor package, statistical devotes to study binary data were conducted [15]. Statistical studies for continuous data were handled using Review Manager 5.4 (Cochrane Partnership) software. Statistics were deemed significant for P-values ≤ 0.05. For continuous factors, a weighted mean difference (WMD) was computed. If the numerical data were offered as a median, range, or interquartile range, the findings were roughly calculated via a mean and standard deviation with the use of the chi-squared test. Take a look at Fisher's particular test.

RESULTS

During the trial, 82 patients received fast breast remodeling after mastectomy. 34 patients did not gain any systemic therapy, 28 patients had preoperative chemotherapy and 20 patients received postoperative chemotherapy. At the time of the mastectomy, the patients at the equal time had age ranged from 25 to 72 years (mean, 48.2 years), which did not fluctuate significantly between the groups (P =.18). Although no cases were smoking at the time of surgery, nearly 27% of sufferers ordinary indicated documents of tobacco use (history). The smoking companies no longer fluctuate or have significant p-value (P =.63). Between the three groups, the common BMI was once as quick as moreover notably identical (P =.94). There had been absolutely two patients with diabetes mellitus in our study, one individual in the chemotherapy-free group and one in the neoadjuvant chemotherapy group both developed diabetes mellitus (Table (1)).

Table (1): Demographic data of patients and staging

characteristic of patients	Non (n=34)	Neoadjuvant (n=28)	Adjuvant (n=20)	P value
Age at the examination time means (range)	49 (25.1-70.2)	46.4 (28.1-71.8)	48.2(26.1-72.5)	.18
BMI kg/m ²	25.2(17.4-44)	25.3(18.7-38.8)	25.3(18.5-40)	.94
No. exposure to radiation (%)	4(12)	2(7)	5(25)	.05
Smoker no (%)	7(21)	9(32)	5(25)	.63
diabetic m.	1(29)	1(35)	0	
Histopathology no (%)				>0.001
Negative cancer	3(9)	1(3)	0	
Still In situ	14(41)	2(7)	1(5)	
invasive ductal carcinoma	15(44)	20(70)	17(85)	
Invasive lobular type	3(9)	7(25)	1(5)	
Staging no (%)	43	28	20	>0.001
StagI0	13(38)	1(3)	0	
St. I	16(47)	4(14)	6(30)	
St.II	4 (12)	10(36)	7(35)	
St.III	1(3)	13(46)	7(35)	
St.IV	0	0	0	
RadiatiPostoperativet operative	0	16(57)	10(36)	.5

Majority of cases in the NACT cases and nearly more than 50% in the ACT cases received doxorubicin hydrochloride/cyclophosphamide and paclitaxel as part of a typical chemotherapeutic regimen. Before having a mastectomy, 13% of patients had received radiation therapy. Trastuzumab was then administered to 20% of patients receiving NACT and 17% of patients receiving ACT five to six weeks onset after the mastectomy to give the wound adequate time to heal, and immediate repair was performed. Basic mastectomy, Skin-sparing mastectomy, and complete skin-sparing mastectomy with nipple-areolar renovation had been the surgical techniques used. While, the remaining underwent autologous reconstruction, 69% of cases underwent an immediate restoration that concerned the implantation of a tissue expander and a preliminary implant. Between groups, there used to be as soon as no huge distinction in the kind of mastectomy (P =.78) (Table 2).

Table (2): types of operative procedures and techniques

procedure	Non (n=34)	Neo-adjutant (n=28)	Adjuvant (n=20)	P value
Mastectomies typing no. (%)				.78
Sparing skin flap	23(68)	17(61)	12(60)	
NA saving with total SS.	11(32)	11(39)	8(40)	
Reconstructive surgery procedures no. (%)				.002
Tissue expander	18(53)	14(50)	16(80)	
Inert implant	5(15)	1(3)	0	
Pedicle flap (TRAM)	8(23)	12(43)	4(20)	
Deep IEPF	2(6)	1(3)	1(5)	
other procedures	1(3)	0	0	
Both sides	12(35)	12(43)	10(50)	.44

Transverse rectus abdominis muscle reconstruction was, however, significantly larger and often used amongst cases who acquired neoadjuvant chemotherapy (43%), as opposed to the 20% of adjuvant and 23% of no chemotherapy categories. The most common postoperative complications were listed in table (3). 30% of patients were for readmission for surgical treatment equipment. The most common reason for intraoperative procedures used to be tissue expander/implant removal or an unintended implant extraction, which occurred in 22% of cases requiring expander/implant reconstruction. There

was no longer a statistically significant variation in implant failure costs (P =.70). A negligible p value (P =.05) was experienced by 36% of patients receiving adjuvant chemotherapy, compared to 57% of instances receiving neoadjuvant chemotherapy. Chemotherapy underwent postoperative radiation therapy, the implant failure rate was 27% in the group receiving neoadjuvant chemotherapy, which was still greater than average despite this difference. There were three patients in the chemotherapy groups who received neoadjuvant chemotherapy, one in the ACT group, and two in the chemotherapy-free groups who underwent ventral hernia restoration, which was an unexpected surgical intervention (BMI >35 kg/m²). One affected case had a locoregional recurrence, and two instances in the adjuvant group had distal metastases at the recommended 20-month surgical follow-up (ranging from 10 to forty months).

Table 3: Post-operative complication

Postoperative	Non (no=34)	Neoadjuvant NEXT (n0=28)	Adjuvant ACT (no=20)	P value
Infected wound	8 (23)	6 (21)	9 (45)	.5
Enteral antibiotics	1 (3)	3 (10)	3 (15)	
Parental antibiotic	7 (21)	5 (18)	6 (30)	
Unsuspected recurrent re-operation	10 (29)	9 (32)	6 (30)	.79
Minimal skin (minmal or severe)	3 (9)	4 (14)	5 (25)	.55
Postoperative hematoma	1 (3)	2 (7)	2 (10)	.04
Specific, reconstruction of Implant/ expander N%	22	15	17	
Expander/ implanted loss	5(23)	4 (27)	4 (23)	
Specific Autologous reconstruction N (%)	10	15	6	
Rectus diastasis and hernia	2 (20)	2 (13)	1 (16)	.87
Seroma at the donor area	1 (10)	0	0	.27
Flab necrosis and loss	0	1 (7)	0	.77

DISCUSSION

Numerous research results after mastectomy emphasize the effect of post-mastectomy complications and immediate reconstruction on the therapeutic effects of radiation therapy, particularly in those who went through expander/implant reconstruction⁽⁷⁻⁸⁾. Age and other patient attributes are believed to have a bearing on the efficacy of breast reconstruction, and this is especially true for implant-based remediation⁽¹⁰⁾. Patients receiving neoadjuvant cures have considered equal outcomes.

The age of the patient in many studies was linked to reconstruction failure in a review of 118 patients who got rapid breast repair following mastectomies. The discovery might be due to a relative impairment of how well older populations heal wounds⁽¹¹⁾. Our group ages ranged from 25-72 years old.

Radiation therapy's consequences have dominated discussions about how to restrict complications issues following rapid reconstruction, which has given upward manner to techniques like delayed-immediate reconstruction or strategies that need autologous and prosthetic reconstruction procedures⁽⁹⁾. However, little has been written about the chemotherapy affection on post-reconstructive penalties following rapid breast reconstruction⁽⁹⁻¹⁰⁾. Due to the extensive use of ACT and NACT in individuals with malignant breasts mass today, there is a significant risk of neutropenia^(14,15). Patients who are getting adjuvant chemotherapy are prolonged in all opportunities of incidence of infections, specially those who nowadays underwent prolonged breast reconstruction with prosthetic implants. However, in contrast to amazing groups, the neoadjuvant chemotherapy group professionals had fewer infectious troubles (21%), while cases receiving adjuvant remedy professionals had the absolute highest incidence of viral infectious troubles (45%). In addition, we placed that cases who acquired adjuvant chemotherapy as the location of most malignant mass treatment trained postoperative troubles before the start of the chemotherapy⁽¹⁶⁾.

However, wondering that systemic chemotherapy used quickly was as delayed completion in 4 patients (20%) of the cases in this group. The immoderate illness amongst cases whose treatment with adjuvant chemotherapy was as soon as quickly clinically where post-surgical sores and infections tend to get among the primary manifestations of chemotherapy⁽¹⁷⁾. Our findings indicate the close connection between high comorbidity scores or wound problems and postponed chemotherapy delivery, as well as obesity. Decrease of BMI in women who had NACT protocol stations had lower complication rates. The improvement of patient selection for breast reconstruction surgery should be the focus of quality efforts. In particular, those with a BMI > 35 kg/m² and a comorbidity score of 2 should be urged by surgeons to

postpone breast surgery⁽¹⁸⁾. The safeguarding association in Beugels' research was considered to be due to significantly younger women in the NACT group and greater smokers in the control group, which may have allowed the NACT group to maintain a low level of complications⁽¹⁸⁻²⁰⁾. But in our study, the age ranged from 25-72 years old and nearly 27% of sufferers' ordinary indicated documents of the history of tobacco use.

Several studies in animal experiments have hooked up diminished wound tensile strength following chemotherapy (adjuvant or neoadjuvant). Precise when ACT is administered at the start few days following surgery⁽²¹⁻²²⁾. The results of the current study had been backed by many studies that compared to patients who didn't get chemotherapy, there was no difference in the likelihood of wound-associated problems between patients who had been given neoadjuvant or adjuvant systemic medication⁽²³⁾.

In clinical trials, frequently reproduced studies assessing the effects of chemotherapy showed no difference in wound-related morbidity in patients who got NACT and ACT treatment in comparison with patients who did not get chemotherapy⁽²²⁾. Prior search has no longer determined prolonged suffering of surgical wound troubles among adjuvant chemotherapy in cases that have surpassed the use of mastectomy and proper new reconstruction⁽²³⁾. In our series, postoperative wound repair problems, included wound collection, hematoma, ventral hernia, infection, and skin loss, which had been extensively normal in the ACT group than in the NACT and non-chemotherapy cases, even though infectious issues did not longer require every oral and intravenous antibiotic. **Beugels et al.**⁽²⁴⁾ meta-analysis slightly rectifies the NACT groups, making the results of BMI effects similar to that obtained credible and generalizable.

In cases receiving neoadjuvant chemotherapy, we decided no extended hazard of infections or wound-related complications. We additionally keep away from systemic bevacizumab, which impairs wound repair. **McCarthy et al.**⁽¹⁹⁾ showed that patients receiving neoadjuvant or adjuvant chemotherapy no longer have a greater incidence of troubles than cases who no longer get hold of chemotherapy. A group of 30 cases underwent a skin-sparing mastectomy, rapid breast reconstruction the use of tissue expanders or implant insertion, and every neoadjuvant and adjuvant chemotherapy had been studied⁽²²⁾.

Mitchem et al.⁽²⁰⁾ showed that 38% of expander/implant reconstructions failed because of wound soreness, expander disruption, or flap death. In our research, the shares for adjuvant and neoadjuvant chemotherapy were 23% and 27%, respectively. Another 18% of the cases did not receive chemotherapy. **Woerdeman et al.**⁽²²⁾ placed focus on cases where a mastectomy procedure skin spares and reconstructs

immediately with an expander or a long-term implant, Explanation rates were between 14% and 20%, which are equivalent to an expander/implant loss rate of 23%.

The results of **Caffo et al.** ⁽¹⁷⁾ who examined 952 cases, realized that 70% of them had NACT previous to receiving rapid reconstructions NACT was a substantial independent indicator of postoperative complications (OR 2.1; p 0.01) and was connected to issues with fat loss and wound mending (OR 2.9; p = 0.02)⁽¹⁷⁾.

According to a meta-analysis information from five studies, there is an insignificant difference between patients being NACT and those who did not in terms of the rate of flap necrosis following autologous transplantation ⁽²⁰⁾. The studies that were added to this study made sure that the patients in both reference arms were properly matched, letting this meta-analysis make universal and more meaningful comparisons ⁽²²⁾.

Despite the relatively modest numbers of patients in each trial group, the statistics imply that patients seeking systemic therapy as part of their malignant mass treatment might also want to try neoadjuvant chemotherapy. According to some estimates, there were no significant variations in either serious or minor complications among patients who acquired neoadjuvant chemotherapy NACT or not before their immediate breast reconstructions (IBR) in terms of rates of broadly adverse events following IBR ⁽¹²⁾.

In fact, in a massive share of cases that day out postoperative complications, the use of neoadjuvant chemotherapy in this context would possibly prolong the evaluation for systemic chemotherapy. **Donker et al.** ⁽²³⁾ although a shorter period between chemotherapy and surgical repair is not harmful to patients regarding postoperative hazards, chemotherapy is linked to aggregate breast reconstruction complications. To our findings, the operation may be conceivable right after chemotherapy has been conducted.

CONCLUSION

We conclude that neoadjuvant chemotherapy is a tightly closed choose-out that no longer exhibits up to make an elevated hazard of postoperative wound troubles for a patient who is planning for mastectomy and straight-away reconstruction. These findings aid the use of remarkable new reconstruction in these affected patients' group and enlarge the opportunity of neoadjuvant chemotherapy in a patient who selects it, even those who will have a mastectomy.

LIMITATION

Small amounts of patients. Loss of patients long follow-up and a lack of communication between the others centers of treatment or investigation.

Conflicts of interest: None

Funding found: None.

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