Oncoplastic versus breast conservativesurgery in surgical management of aggressive breast cancer

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ABSTRACT

Background *Breast cancer is a clinically and biologically heterogeneous disease, characterized by dysregulation of multiple cellular pathways and different sensitivities to treatment. Some types of breast cancers are more aggressive than others such as triple negative, high grade and high Ki 67 proliferation index. The aim of surgery for breast cancer have remained consistent over the time , to eliminate breast cancer with the least degree of deformity. With improved survival after aggressive breast cancer treatment, more attention has turned to the cosmetic result of the surgical treatment.* ***Patient and methods*** *The study included 30 patients with features of aggressive breast cancer including: triple negative, grade three or high Ki67 proliferation index. They were distributed into 15 patients who underwent conservative breast surgery and 15 patients who underwent oncoplastic breast surgery. Postoperative outcome and follow up were compared and evaluated.* ***Results*** *The age of the patients varied from 30 to 65 years old (mean age 48.7).Five patients among patient population s had medical co morbidities . The oncoplastic group included six patients who underwent superior pedicle flap procedure, five patients who underwent donut mastopexy and four patients who underwent inferior flap reconstructive breast surgery. The mean operating time for the conservative group was 1 hour and 30 minutes versus 2 hours and 15 minutes for the oncoplastic group (P value 0.53).The mean post-operative stay period for the oncoplastic group was 35 hours versus 28 hours for the conservative group surgery (P value 0.48).No statistical significance regarding short and long term surgical complications or locoregional recurrence with considerable statistical significance regarding the cosmetic outcome in favor of the oncoplastic group (P value 0.03).* ***Conclusion*** *Aggressive breast cancer surgical options has evolved recently and as regarding the comparable oncological outcome and low complication rates with considerable superior cosmetic outcome , oncoplastic breast surgery can be a preferred option in surgical management of aggressive breast cancer.*

Keywords: *Aggressive breast cancer, triple negative, grade three breast cancer,Ki 67, oncoplastic breast surgery, breast conservative surgery.*

INTRODUCTION

Breast cancer is the most prevalent cancer malignancy and the leading cause of cancer-related mortality in women in developed countries. In 2014 in the United States, an estimated 232,670 women will be diagnosed with invasive breast cancer, and 40,000 will die from it. In 2012 in Europe, there were an estimated 463,800 new breast cancer cases and 131, 200 breast cancer–related deaths[17].

Some types of breast cancers are more aggressive than others such as triple negative, high grade and high Ki 67 proliferation index. However, the ability to identify factors associated with aggressive breast cancer and to predict prognosis and treatment response has a considerable impact on patient management [17].

Triple-negative breast cancer is a heterogeneous group characterized by the lack of expression of hormonal receptors and the absence of HER2 over expression and it represents approximately 15% of all breast cancer patients and is characterized by shorter overall survival and an early peak of distant recurrences at 3 years after diagnosis. The majority of deaths occur in the first 5 years following initial diagnosis. Triple negative breast cancer has an aggressive clinical behavior, with a higher risk of both local and distant relapses[14].

A great number of histopathologic features and biomolecular markers have been studied during the last decades in order to detect risk factors for local and distant recurrences, and consequently to predict breast cancer behavior and response to the therapies . The histological grading represents one of these factors, being the

expression of the proliferative ability of neoplastic cell. Histological grading is calculated through the evaluation of three characteristics of breast cancer cells, including mitotic count, nuclear pleomorphism, and tube formation (considering the amount of tumor tissue with normal duct structure[8].

Tumor proliferative activity, an important cellular function, is closely related to tumor behavior in breast cancer. Various techniques have been developed to assess the proliferation rates, including mitotic count, estimation of the cell fraction in S-phase of cell cycle and immunohistochemical (IHC) determination of proliferation-associated antigens. Ki-67 is one of the most widely used IHC proliferation antigens and has been confirmed as an independent predictive and prognostic factor in breast cancer[45].

Breast conservation treatment (BCT) defined as breast conservation surgery (BCS) with whole breast irradiation is the standard of care in the management of early breast cancer. The goal of BCT is tumor-free resection margins and good local control. An important secondary goal is a satisfactory cosmetic outcome as this is associated with both patient satisfaction and improved quality of life. Poor cosmetic outcomes can affect up to 40% of patients undergoing BCT[6].

Oncoplastic breast surgery is increasingly becoming part of routine breast cancer surgical management. It may be viewed as an extension of standard breast conservation surgery for resecting tumors of larger sizes without compromising on cosmetic outcome, or as an alternative to mastectomy[6].

The aim of surgery for breast cancer have remained consistent over the time, to eliminate breast cancer with the least degree of deformity. With improved survival after aggressive breast cancer treatment, more attention has turned to the cosmetic result of the surgical treatment.

PATIENTS AND METHODS

This prospective comparative cohort study was conducted on patients diagnosed to have aggressive breast cancer in General Surgery Department in Ain Shams University Hospitals from January 2017 till June 2018. The study was IRB approved.

Patients with aggressive breast cancers include grade 3 invasive breast cancer histopathology, triple negative breast cancers or ki-67 >20%.

The study included thirty patients who were distributed into fifteen patients who underwent conservative breast surgery and fifteen patients who underwent oncoplastic breast surgery, randomly samples with computer program.

Inclusion criteria included female patients ranging from age of 20-65 years old with triple negative breast cancers or histopathological grade 3 invasive breast cancer or Ki-67 reactivity more than 20% **,** , T1-2 N0-1 M0 tumors , T3 N0-1 M0 tumors not responding to neoadjuvant chemotherapy in large breasts.

Exclusion criteria included: multicenteric tumors, pregnant patients, patients who are contraindicated to take radiotherapy and patients refusing conservative or oncoplastic breast surgery

All patients included in the study had been candidates for clinical assessment including: medical history, menstrual history, family history, general examination and full breast examination .

Investigations included: routine laboratory investigations (including serum alkaline phosphates), bilateral sono-mammography, breast MRI to exclude multicentric tumors, true cut needle biopsy with assessment of estrogen receptors, progesterone receptors, HER2 Neu , Ki 67 reactivity and histopathological grading in addition to any requested investigations by the anesthesiologist.

Metastatic work up included: pelvi-abdominal ultrasound if N0 or pelvi-abdominal computed tomography if N $\geq$1, chest x-ray if N0 or chest computed tomography if N $\geq$1. Bone scan is done if there is elevated serum alkaline phosphatase or history of recent bony aches.

All thirty cases included in our study were discussed in multidisciplinary meeting (MDT) . MDT decided which patient would receive neoadjuvant chemotherapy before surgery. The neoadjuvant chemotherapy regimen was three sessions of FEC (fluorouracil, epirubicin and cyclophosphamide) and three sessions of taxotere, with an interval of 3 weeks between each session. Clipping of the tumor was done before neoadjuvant chemotherapy with subsequent ultrasound guided wire localization before surgical intervention. The response to neoadjuvant chemotherapy was assessed by the

decrease in size of tumor via bilateral sonomammography. Radiotherapy was given within four months after the operation.

All patients were followed up after intervention regularly by the surgery and oncology team. First time, after three months of radiotherapy via clinical assessment and bilateral sonomammography, then by clinical assessment at an interval of three to six months and bilateral sonomammography every six months for eighteen months. Within these regular assessments, all thirty patients were closely monitored for any postoperative complications, either short term (first three months) with assessment of seroma formation (breast or axilla), any wound infection, integrity of the skin flaps and assessment of the scar, or long term complications (second fifteen months) including the assessment of the final cosmetic outcome or any loco regional recurrence .

General considerations taken for all oncoplastic and conservative breast surgeries are not to compromise the oncological safety**,** to consider all the associated comorbidities and risk factors evident in the included patients, to take into account the potential delay in adjuvant treatment which may occur as a result of complications and to consider how adjuvant treatment may adversely affect the outcome of reconstruction.

The MDT must ensure that the patients has adequate time to: make an informed decision, to have an opportunity to meet other patients who have had a similar surgical approach, to discuss perceived risks and benefits and the full range of additional procedures that may be required.

Data was collected, tabulated and statistically analyzed. Description of quantitative variable was done as mean and standard deviation, and qualitative data as frequency. Chi square test was used to compare the groups as regard qualitative variable. Student t-test was used to compare two groups as regard quantitative variable in parametric data. The results were considered significant with p value (p) < 0.05, while $p \geq 0.05$ was considered non-significant.

RESULTS

All thirty patients were included in the study. They were distributed into fifteen patients who underwent conservative breast surgery and fifteen patients who underwent oncoplastic breast surgery for aggressive breast cancer patients. The oncoplastic group included six patients who underwent superior pedicle flap procedure, five patients who underwent donut mastopexy and four patients who underwent inferior flap reconstructive breast surgery, (Table 1-Figure 1).

Table (1): Distribution of surgeries done in our study.

Type of surgery	**Conservative breast surgery**	**Oncoplastic breast surgery**		
		Superior pedicle	**Donut mastopexy**	**Inferior pedicle**
Number of surgery	15	6	5	4

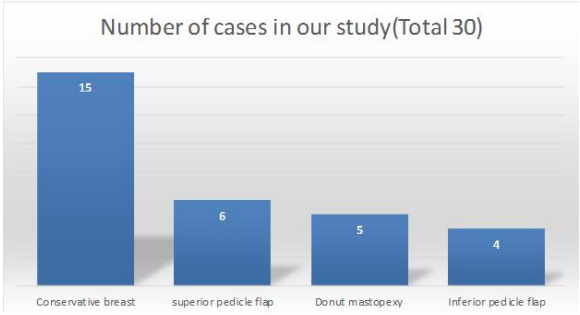

Fig. (1): Distribution of surgeries in the study.

The age of the patients varied from 30 to 65 years old. The mean age for our study was 48.7,(Table 2).

Table (2): Mean age of the study.

	Mean	**±SD**	**Mini.**	**Maxi.**
Age(years)	48.70	10	30	65

On pre-operative patient evaluation, five patients among the thirty patients were found to have medical co morbidities. three patients had diabetes mellitus, one patient had hypertension and one patient had ischemic heart disease,(Table 3,Figure 2).

Table (3): Number and percentage of comorbidities.

Comorbidity	*Number of patients*	*percentage*
DM	3	10.0%
HTN	1	3.3%
IHD	1	3.3%

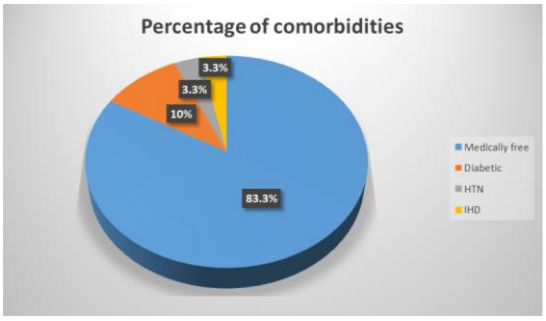

Fig. (2): Percentage of comorbidities.

All thirty patients were investigated by true cut biopsy from both breast lesion preoperatively. Six patients turned out to be grade 3 invasive breast cancer and were included in our study. Four patients underwent conservative breast surgery and the other two patients underwent oncoplastic breast surgery,(Table 4, Figure 3).

Seven out of the thirty patients included in our study were triple negative and were included in our study. Four patients underwent conservative breast surgery and the other three underwent oncoplastic breast surgery, (Table 4, Figure 3).

All patients underwent ki 67% reactivity and ki reactivity was>20% in six patients and were involved in our study. Four patients underwent oncoplastic breast surgery and the other two underwent conservative breast surgery,(Table 4, Figure 3).

There was an overlap of the inclusion criteria in the patient population. Four patients turned out to be grade 3 invasive breast cancer and triple negative, from them three patients underwent oncoplastic surgery and one patient underwent breast conservative surgery. Two patients had both ki 67 reactivity >20% and grade 3 invasive breast cancer, one patient underwent oncoplastic surgery and the other underwent breast conservative surgery. Three patients were both triple negative and ki 67 reactivity >20%, two patients underwent breast conservative surgery and one patient underwent oncolplastic surgery. Only two patients had all three criteria of being grade 3 invasive breast cancer, triple negative and ki 67 reactivity >20% one patient underwent breast conservative surgery and the other underwent oncoplastic surgery (Table 4, Figure 3).

Table (4): Grade 3 invasive breast cancer, triple negative and ki 67reactivity >20% incidence among included patients.

Inclusion criteria	**Number of patients included (from 30 patients)**	**Number of patients underwent Oncoplastic breast surgery**	**Number of patients underwent Conservative breast surgery**
Grade 3 invasive breast cancer only	6	2	4
Triple negative only	7	3	4
Ki 67% reactivity >20% only	6	4	2
Grade 3 invasive breast cancer and triple negative	4	3	1
Grade 3 invasive breast cancer and ki 67>20%	2	1	1
Triple negative and ki67>20%	3	1	2
Grade 3 invasive breast cancer and triple negative and ki 67>20%	2	1	1

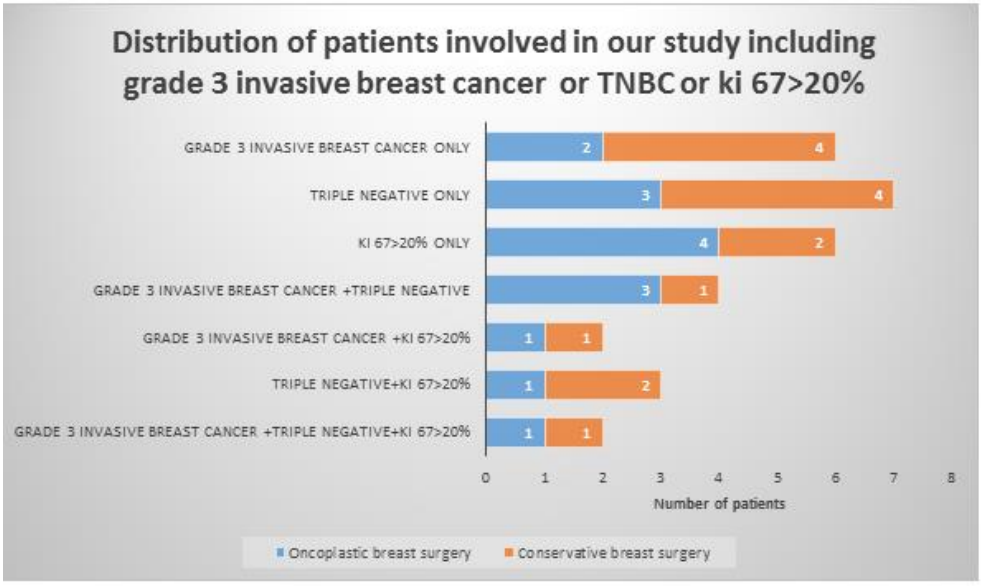

Fig. (3): Grade 3 invasive breast cancer, triple negative and ki 67reactivity >20% incidence among included patients.

Frozen histopathology was done for all of the thirty patients intraoperatively and their margins turned out to be free. Average time of the frozen histopathology results was twenty minutes.

Out of thirty patients included in our study, twenty seven patient received neoadjuvant chemotherapy and only three patients underwent surgery without neoadjuvant chemotherapy. These three patients were T2N0. The response to neoadjuvant chemotherapy was assessed by the decrease in size of tumor via bilateral sonomammography, where twenty five out of twenty seven patients who received neoadjuvant chemotherapy showed good response to chemotherapy. However, the breast size to tumor mass ratio was favorable for both conservative and oncoplastic surgeries.

Operative time was evaluated in all of the thirty surgical procedures, from the beginning of the operation timed by skin incision until the end of the procedure marked by the end of skin closure, including the time of frozen histopathology. There was no significant variability between the two groups. The mean operation time of the conservative breast surgery was 1 hour and 30 minutes, while the mean operation time of the oncoplastic surgery was 2 hours and 15 minutes,(Table 5,Figure 4).The excised specimen were sent for paraffin histopathological assessment .

Table (5): Mean operation time for surgical procedures.

	Oncoplastic breast surgery		**Conservative breast surgery**		**P value**
	Mean	**±SD**	**Mean**	**±SD**	
Operative time(minutes)	135.0	15.5	90.0	10.9	0.53

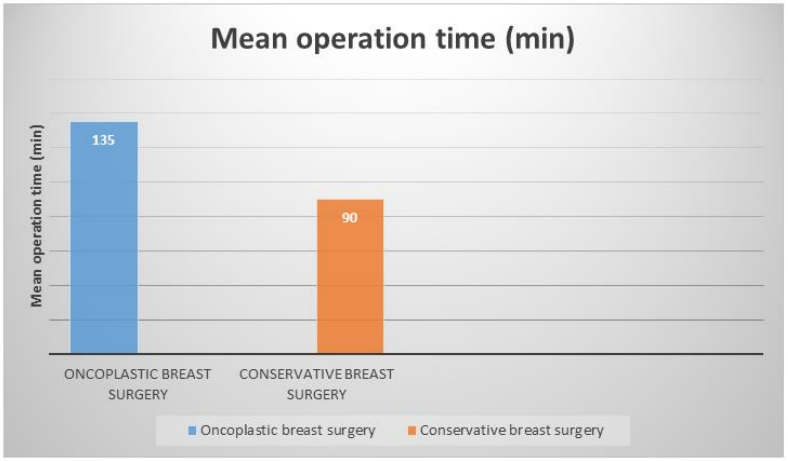

Fig. (4): Mean operation time for surgical procedures.

The post-operative stay period was recorded for all patients. The mean post-operative stay period for the oncoplastic surgery patients was 35 hours versus 28 hours for the conservative breast surgery, (Table 6, Figure 5)

Table (6): The mean post-operative stay for our study.

	Oncoplastic breast surgery		**Conservative breast surgery**		**P value**
	Mean	**±SD**	**Mean**	**±SD**	
Postoperative hospital stay(hours)	35	10.5	28	8.2	0.48

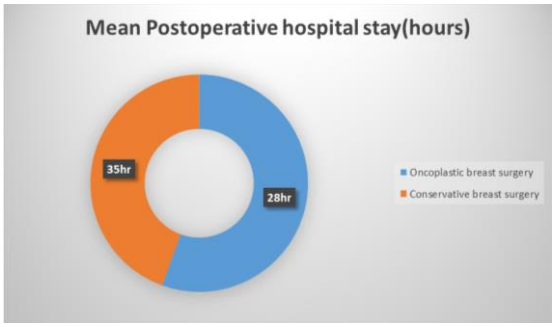

Fig. (5): The mean post-operative stay for our study.

During the follow up period, postoperative seroma (breast or axilla) occurred only in five cases out of thirty with an incidence of 16.6 %., three cases of oncoplastic surgery versus two cases of conservative breast surgery. All of them were discovered during the first week postoperative and managed conservatively. Patients were prescribed anti-edema measures and were already on parenteral antibiotic. Seroma resolved spontaneously after 3 weeks,(Table 7, Figure 6).

Viability of flap was monitored in all patients in the first postoperative day and then during the regular follow up clinical assessment by the surgery team. Only one case of oncoplastic surgery (superior pedicle) developed flap necrosis with an incidence of 3.3 % and was managed by debridement. No cases were recorded from the patients who underwent conservative breast surgery intervention,(Table 7, Figure 6).

Among the thirty patients included, only two patients developed wound infection with an incidence of 6.6 %, (one in each group), both of them were diabetic and one of them was ischemic heart disease. They were treated by broad spectrum antibiotics and daily dressing, followed by closure with secondary sutures after 1 month,(Table 7, Figure 6).

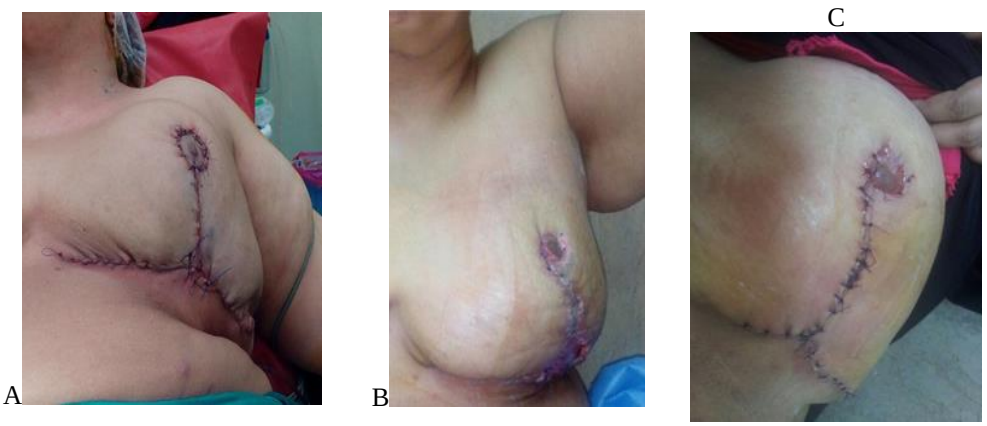

Fig. (6): (A) Superior pedicle OPS postoperative. (B) Wound infection and dehiscence occurred at the inverted T. (C) Secondary sutures done after daily dressing and antibiotics.

None of the 30 patients involved in our study developed hypertrophic or keloid scar,(Table 7,Figure 7).

Table (7): Short term postoperative complications results.

Short term complications	Number of patients with complications (out of 30 patients)	Number of Oncoplastic breast surgery patients	Number of Conservative breast surgery patients	P value
Seroma	5	3	2	0.06
Flap necrosis	1	1	0	0.08
Wound infection	2	1	1	0.89
Scar	0	0	0	0.98

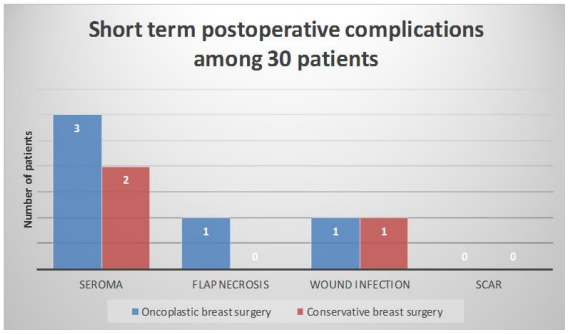

Fig. (7): Short term postoperative complications results.

None of the previously stated complications resulted in delay of post-operative adjuvant radiotherapy therapy and all patients were sent to receive their appropriate therapy according to schedule.

All patients had been followed after intervention regularly by the surgery and oncology team. First time after three months of radiotherapy, via clinical assessment and bilateral sonomammography, then by clinical assessment at an interval of three to six months and bilateral sonomammography every six months.

Only two cases in our study developed local recurrence with an incidence of 6.6 %. The recurrence in one case of oncoplastic surgery (triple negative only) was after 11 months of the operation, while the other case was recorded in a patient who underwent conservative breast surgery (ki 67>20% only) after 12 months of surgery. The two cases were treated by salvage mastectomy. No other cases in the study had local recurrence,(Table 8).

Table (8): Loco-regional recurrence results.

	Number of patients with loco-regional recurrence (out of 30 patients)	Number of Oncoplastic breast surgery patients	Number of Conservative breast surgery patients	P value
Loco-regional recurrence	1	0	1	0.63

Cosmetic outcome was estimated using a scoring system which was made up from the three independent grading parties (Surgeon, Patient and MDT of the breast) based on the level of satisfaction to give an overall score for cosmetic outcome.

The cosmetic outcome score was based on multiple items that made up a check list to be evaluated by our team and the MDT of the breast for every single case, this check list included the overall shape of the breast, the site and direction of the nipple, the volume of the breast and the skin incision shape.

These elements were discussed for every single case and analyzed to give a scoring system graded from 1 to 5 as the following: (5 = Excellent ,4 = Very good ,3 = Good ,2 = Fair ,1 = Poor ,0 = Ugly).

The overall mean score of the cosmetic outcome for oncoplastic breast surgery was 4.23 which fall between very good and excellent. While the overall mean score of the cosmetic outcome for conservative breast surgery was 2.93 which falls between very good and good,(Table 9, Figure 8-11).

Table (9): Mean score of the cosmetic outcome for the study.

	Oncoplastic breast surgery				Conservative breast surgery				
Cosmetic outcome	Mean	±SD	Minimum	Maximum	Mean	±SD	Minimum	Maximum	P value
	4.23	0.86	3.00	5.00	2.93	1	1.00	5.00	0.03

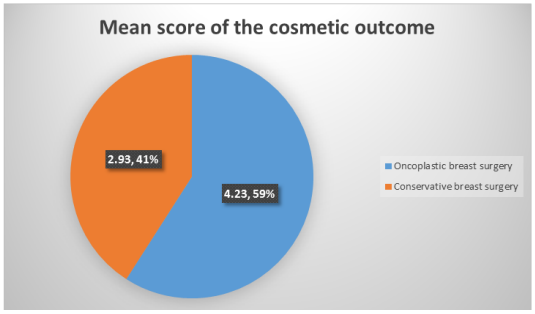

Fig. (8): Mean score of the cosmetic outcome for the study.

Fig. (9): Donut mammoplasty pre and postoperative.

Fig. (10): Inferior pedicle pre and postoperative.

Fig. (11): Superior pedicle pre and postoperative.

DISCUSSION

"Aggressive breast cancer" is not a standard term commonly used in the breast cancer literature. However, the ability to identify factors associated with aggressive breast cancer and to predict prognosis and treatment response has a considerable impact on patient management [17].

Patients with aggressive breast cancers include grade 3 invasive breast cancer histopathology or triple negative breast cancers or breast cancer patients with ki-67 reactivity>20%[17].

Triple-negative breast cancer accounts for approximately 15%-25% of all breast cancer cases. Triple-negative breast cancer (TNBC) refers to any breast cancer that does not express the genes for estrogen receptor (ER), progesterone receptor (PR) or Her2/neu. This makes it more difficult to treat since most hormone therapies target one of the three receptors, so triple-negative cancers often require combination therapy[9].

Ki-67 is used to assess tumor cell proliferation (analogous to flow cytometric S-phase fraction). Higher Ki-67 reactivity in tumor tissue is associated with adverse outcomes. For breast cancer, prognosis is considered to be favorable with Ki-67 <10%, borderline if 10% to 20%, and unfavorable if >20%[4].

The grade of a breast cancer is representative of the "aggressive potential" of the tumor; in a broad generalization, "low grade" cancers tend to be less aggressive than "high grade" cancers. Determining the grade is thus very important, and the clinicians use this information to help guide the treatment options for patients[43].

Breast-conservation surgery (BCS) is established as a safe option for most women with aggressive breast cancer. In spite of the acceptance that most BCS defects can be managed with primary closure, the aesthetic outcome may be unpredictable and frequently achieve an unsatisfactory outcome. Therefore, oncoplastic surgery is the ''third pathway'' between standard BCS and mastectomy[28]

Oncoplastic surgery (OPS) has emerged as a new approach to allow wide excision for BCS without compromising the natural shape of the breast. It is based upon integration of plastic surgery techniques for immediate breast reshaping after wide excision for breast cancer. The conceptual idea of OPS is not new, and its oncologic efficacy in terms of margin status and recurrence compare favorably with traditional BCS[1].

The study included thirty patients with features of aggressive breast cancer .They were distributed into fiveteen patients who underwent conservative breast surgery and fifteen patients who underwent oncoplastic breast surgery. The age of the patients varied from 30 to 65 years old. The mean age of our study was 48.7 years, 50% of the cases fall between 45 to 55 years which is consistent with the demographic data published by National Cancer Institute at 2013 by Zeeneldin et al.[50] who claimed the peak incidence of breast cancer between 40 -59 years old[50].

Medical Comorbidities were allocated preoperatively. On pre-operative patient evaluation, five among the thirty patients were found to have medical comorbidities. Three patients had diabetes mellitus, one patient had hypertension and one patient had ischemic heart disease. The two cases of wound infection were diabetic and one of them had ischemic heart disease, which signifies that medical co morbidities affect the healing after breast surgeries.

In our study, we started recruiting patients with aggressive breast cancer criteria including grade 3 invasive breast cancer or triple negative IHC or Ki 67 reactivity >20%. There was an overlap of the inclusion criteria in the patient population. Four patients turned out to be grade 3 invasive breast cancer and triple negative. Two patients had both ki 67 reactivity >20% and grade 3 invasive breast cancer. Three patients were both triple negative and ki 67 reactivity >20%,. Only two patients had all three criteria of being grade 3 invasive breast cancer, triple negative and ki 67 reactivity >20%.

Out of thirty patients included in our study, twenty seven patient received neoadjuvant chemotherapy and only three patients underwent surgery without neoadjuvant chemotherapy. These three patients were T2N0. The response to neoadjuvant chemotherapy was assessed by the decrease in size of tumor via bilateral sonomammography, where twenty five out of twenty seven patients who received neoadjuvant chemotherapy showed good response to chemotherapy. However, the breast size to tumor mass ratio was favorable for both conservative and oncoplastic groups.

Operative time was evaluated in all of the 30 surgical procedures, from the beginning of the operation timed by skin incision until the end of the procedure marked by the end of skin closure, including the time of frozen histopathology (which was 20 minutes). The mean operation time of the conservative breast surgery was 1 hour and 30 minutes, while the mean operation time of the oncoplastic surgery was 2 hours and 15 minutes. There was no statistical significance between the 2 operations as regards the operative time, with a p value 0.53.

Involved resection margins are one of the most important factors associated with local recurrence after BCS and OPS. The standard surgical practice is to obtain clear margins even if this requires a second surgical procedure. The evidence base for surgical margins is continuously evolving and there is no universal consensus on what defines a positive margin[30].

In our study, frozen histopathology was done for all of the thirty patients intraoperatively and their margins turned out to be free for both operations with no statistical significance.

The post-operative stay period was recorded for all patients. There was no statistical significance between the two operations, with a p value 0.48. The mean post-operative stay period for the oncoplastic surgery patients was 35 hours versus 28 hours for the conservative breast surgery.

Regarding the short term complications, some studies comparing OPS with BCS have reported no difference in surgical complications between the groups. One of the prospective studies was conducted by Chauhan and Sharma 2016[11], where thirty three patients underwent oncoplastic surgery was compared with 46 patients of conventional breast conservation, as regards the surgical outcomes. There were 3 cases (9%) of peri-operative complication in OPS group. Amongst them, there was one incidence each of hematoma, surgical site infection and partial necrosis of nipple areolar complex. All of these resolved by conservative measures. In conventional BCS, peri-operative complication was recorded in 5 patients (11%). Amongst these, two cases had surgical site infection, two had infection of seroma cavity and one had skin flap necrosis. There was no statistical difference between the two groups in terms of incidence of complication[11].

While other studies such as Carter et al.[7] compared complication rates in patients treated with BCS versus OPS, reported that OPS had a lower seroma rate (13%) than BCS but wound-related complications (4.8%) were statistically higher in OPS. While OPS and BCS had similar hematoma (2%) and surgical site infection (4.5%) rates[7].

In our study, short term complications were monitored during the first 3 months, which revealed that none of them were statistically significant between the two groups, with a p value >0.05, including seroma formation (breast or axilla), integrity of skin flaps, wound infection and scar formation.

Postoperative seroma (breast or axilla) occurred only in five cases out of thirty with an incidence of 16.6 %, three cases of oncoplastic surgery versus two cases of conservative breast surgery. All of them were discovered during the first week postoperative and managed conservatively, resolving within three weeks. There was no statistical significance between the two groups as regards postoperative seroma, with a p value 0.06.

Tenofsky et al.[39] compared OPS with BCS and reported a higher rate of non-healing wounds and flap necrosis in the OPS group, although this did not prolong time to radiation therapy in the OPS[39].

Only one case of oncoplastic surgery (superior pedicle) developed flap necrosis with an incidence of 3.3% and was managed by debridement. This is expected in oncoplastic procedures more than conservative breast surgeries because of the extensive dissection of breast tissue to raise a flap in oncoplastic breast surgeries, which could affect the blood supply of the flap leading to flap necrosis. No cases were recorded from patients who underwent conservative breast surgery intervention. There was no statistical significance between the 2 groups as regards flap necrosis, with a p value 0.08.

Wound infection occurred in two patients only with an incidence of 6.6 %, one in each group. Both patients were diabetic and one of them had ischemic heart disease. They were treated by broad spectrum antibiotics and daily dressing, followed by closure with secondary sutures after 1 month. This result could imply that there is an association between medical comorbidities

associated in a patient with their wound infection possibility postoperatively. There was no statistical significance between the two groups as regards wound infection, with a p value 0.89.Other known short term complications like are hypertrophic scar or keloid were not recorded in our clinical assessment done during the regular follow up.

Alexandre Munhoz[32] describes the modern oncoplastic breast surgery as a combination of oncologic and plastic surgery techniques to obtain oncologically sound and aesthetically pleasing results[32].

Thus, by means of customized techniques the surgeon ensures that oncologic principles are not jeopardized while meeting the needs of the patient from an aesthetic point of view[26].

Through the years, oncoplastic breast surgery has enabled surgeons to remove greater volumes of tissue successfully, and thus reducing mastectomy and re-excision rates.

The combination between the oncological and asthenic aspects has resulted in more oncological safety for patients, as it allows larger resections, with wider margins, aiming to avoid compromising aesthetic– functional outcomes[41].

Regarding the long term complications (loco-regional recurrence), most of the studies comparing OPS with BCS have reported no difference in loco-regional recurrence between the groups. One of the studies was conducted by Chakravorty et al.[10], reported equivalent safety in a retrospective comparative study that compared OPS with BCS. The OPS group included significantly larger tumors, higher grade and more patients had received neoadjuvant chemotherapy. However, the OPS also included a significant greater number of patients with noninvasive breast cancer. There was no significant difference in loco-regional recurrence rates (OPS 2.7% vs BCS 2.2%) at median follow-up of 28 months[10].

Also, De Lorenzi et al.[15] compared 454 consecutive patients who underwent an OPS between 2000 and 2008 for primary invasive breast tumors with twice the number of patients who received conservation alone in the same interval time, as regards the oncological outcome, where there was no statistical significance[15].

Niinikosk et al.[34] reviewd 1800 consecutive patients with invasive breast cancer who underwent conservative and oncoplastic breast surgery at Helsinki University Hospital between 2010 and 2012.They concluded that there is no difference in local recurrence-free survival between the conventional breast conservative and oncoplastic groups although , the oncoplastic surgeries were used for larger more aggressive tumors.

In our study, there was no statistical significance between the 2 groups regarding the loco-regional recurrence, with a p value 0.87. Only two cases in our study developed local recurrence with incidence of 6.6 %. The recurrence in one case of oncoplastic surgery (triple negative only) was after 11 months of the operation, while the other case was recorded in a patient who underwent conservative breast surgery (ki 67>20% only) after 12 months of surgery. The two cases were treated by salvage mastectomy.

Cosmetic outcome between OPS and BCS had been studied in literature, where most studies report good cosmetic outcome after OPS in nearly 90% of patients. However, variation in how cosmetic outcome was evaluated, reporting with non-validated assessment tools and timing of evaluation for cosmetic outcome is heterogeneous. Evaluation of cosmetic outcome should be performed at least 1.5 years postoperatively to allow for long-term effects of radiation therapy. Patient self-evaluation is a valuable assessment because the subjective experience of the patient is central to assessment of quality of life, however, patients frequently report better scores than professionals. Haloua et al. suggest a combination of cosmetic assessments will produce the most reliable results[19].

In our study, there was a statistically significant result between the 2 groups as regards the long term cosmetic outcome with a p value 0.03, where the overall mean score of the cosmetic outcome for oncoplastic breast surgery was 4.23 which falls between very good and excellent. While the overall mean score of the cosmetic outcome for conservative breast surgery was 2.93 which falls between very good and good. Cosmetic outcome was estimated using a scoring system which was made up from the three independent grading parties (Surgeon, Patient and MDT staff of the breast) based on the level of satisfaction to give an overall score for cosmetic outcome.

These results were consistent with the Systematic review performed by Haloua et al.[19],

among 25 studies evaluated the cosmetic outcome of OBCS patients (n=1,962). OBCS achieved excellent, good, fair or poor outomes in 55.2%, 31.0%, 9.4% and 4.4% of patients, respectively. Most studies report good cosmetic outcome after OBCS in nearly 90% of patients[19].

Oncoplastic surgery is redefining breast cancer surgery today. randomised clinical trials current evidence suggests at least equivalent oncological outcomes, reduced re-excision rates and superior aesthetic results. Our study clearly suggests that oncoplastic and conservative breast surgery have comparable oncological and surgical outcome with a clearly superior cosmetic outcome in favor of the oncoplastic techniques even in aggressive breast tumors.

Further studies and reviews should be conducted to assess other outcomes that may be affected by performing oncoplastic or conservative breast surgery in aggressive breast cancers.

CONCLUSION

Agressive breast cancer surgical options has evolved recently and as regarding the comparable oncological outcome and low complication rates with considerable superior cosmetic outcome , oncoplastic breast surgery can be a preferred option in surgical management of aggressive breast cancer.

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