



ORIGINAL ARTICLE

Primary breast cancer management, Conservative breast surgery versus oncoplastic breast surgery, a comparative study

Ibrahim Heggy^I, Taha A. Baiomy^I, Mohamed Ali Alabiad^{II*}, Sherin A. Shazly^{III}, Abdelwah S. Almoregy^I

I: Department of General Surgery, Faculty of Medicine, Zagazig University Egypt

II: Department of Pathology, Zagazig University Faculty of Medicine, Zagazig University Egypt.

III: Department of Gynecology and Obstetrics, Zagazig University Faculty of Medicine, Zagazig University Egypt

*** Corresponding author:**

Mohamed Ali Alabiad

Lecturer of Pathology,
Faculty of Medicine, Zagazig
University

Email: alabiad@zu.edu.eg

Submit Date: 2020-06-09

Revise Date: 2020-07-09

Accept Date: 2020-07-21

ABSTRACT

Background: Although CBS was found to be nearly equal to radical approaches as it allow removal of diseased tissues with sufficient safety margins of un-diseased breast tissues but the shape of the breast is not conserved that lead to marked post-operative deformities which leads to psychic troubles particularly in younger females. Oncoplastic breast surgery (OBS) allows better resection of huge tumors and it becomes a preferred surgical approach of cancer breast management as it allows combination of both oncological and plastic surgery principles and reaching satisfaction in both oncological and aesthetic results. Aim of the current study is to compare between CBS and OBS as two different techniques of primary breast cancer management in female patients regarding surgical outcome and post-operative findings. **Methods:** The current study is a comparative, prospective and randomized analysis included 120 breast cancer patients who were divided into two groups: group 1 which included 45 patients who underwent OBS; and group 2 which included 75 patients who underwent CBS. **Results:** We showed that patients underwent OBS were younger than CBS group ($P=0.009$). OBS was more frequently performed for tumors in the lower quadrants ($p=0.001$). Surgical safety margins and volume of excised tissues were larger in OBS group than in CBS group ($p=0.001$). Patients' satisfaction was higher in OBS group than in CBS group ($p<0.001$). We found a lower rate for re-excision and completion mastectomy in OBS group than in CBS group ($p=0.002$). **Conclusions:** We have confirmed safety and feasibility of OBS, reducing rate of post-operative positive margins, tumor recurrence, produced a better cosmetic appearance and a higher patient's satisfaction than the conventional methods of CBS.

Keywords: Breast cancer, conservative breast surgery (CBS), oncoplastic breast surgery (OBS)

INTRODUCTION

Aim of conservative breast surgical (CBS) approaches is to only remove sufficient tissues from the breast to ensure free surgical safety margins of resected specimen. CBS needs accurate localization and description of the tumor preoperatively. Although CBS was

found to be nearly equal to radical approaches as it allow removal of diseased tissues with sufficient safety margins of un-diseased breast tissues but the shape of the breast is not conserved that lead to marked post-operative deformities which leads to psychic troubles particularly in younger females [1]. A recently

described surgical approaches of breast cancer management is oncoplastic breast surgery (OBS) allow expansion of the indications of breast conservation as it allows better resection of huge tumors and even cases presented with locally advanced tumors [2, 3]. OBS become a preferred surgical approach of cancer breast management as it allows combination of both oncological and plastic surgery principles and reaching satisfaction in both oncological and aesthetic results [1]. OBS allows removal of larger tissues which leads to a higher rate of negative margins that subsequently decreased recurrence rates and decreased the incidence of reoperation [4]. OBS in comparison to CBS decreased incidence of breast deformities and improved the shape of the breast [5]. Many surgeons start to consider OBS as the recent standard technique of management of breast cancer [2, 6], but systemic large scale studies are needed to prove its safety and advantages.

Aim of the current study is to compare between CBS and OBS as two different techniques of primary breast cancer management in female patients regarding surgical outcome and post-operative findings.

METHODS

The current study is a comparative, prospective and randomized analysis included 120 breast cancer patients who admitted to General surgery department, Zagazig University Hospitals underwent CBS or OBS in the period between January 2016 and March 2020. We acquired an approval from the institutional review committee of Faculty of Medicine, Zagazig University for making the study.

Patient inclusion criteria

Female patients with histopathologically confirmed breast cancer diagnosed with true cut needle biopsy and excisional biopsy specimens and take no preoperative therapy.

Patients agreed to be included in the study.

Exclusion criteria

Patients with distant metastasis at initial time of diagnosis, patients treated with pre-operative neo-adjuvant therapy, patients with a previous history of primary or recurrent breast cancer.

Patient groups and intervention

After application of inclusion and exclusion criteria for the study we collected 120 patients were divided into two groups: group 1 which included 45 patients who underwent OBS; and group 2 which included 75 patients who underwent CBS. We evaluated patients' records and we recorded the following findings: patients age, site, size and stage of cancer, state of the axillary lymph node, performed surgical procedure, intra-operative findings, amount of excised breast tissue, histopathology of the excised tumors and the state of the surgical margins.

Surgical Procedures

CBS approaches

Twenty patients out of the 75 underwent only quadrantectomy, 10 patients underwent quadrantectomy in addition to sentinel lymph node biopsy, and the remaining 25 patients underwent quadrantectomy in addition to complete axillary dissection.

OBS approaches

The plastic surgeon made the preoperative markings a day before surgery while the patient is standing. Making such markings allow adequate localization of the tumor, avoid unnecessary incisions, allow avoidance of any damage to blood or nerve supply of the skin flap or the nipple.

Thirty patients underwent classic technique of reduction mammoplasty, 8 patients underwent round block mastopexy, and 8 patients underwent a latissimus dorsi flap to fill the mammary defect, and a simple radial incision which was performed over the tumor in the superior quadrant in 7 patients.

We remove the tumor with inclusion of about at least one cm of healthy breast tissues far away from the grossly and clinically detected margins.

Transposition of the nipple and areola was performed if necessary for creation of an aesthetically pleasing breast.

Pathological evaluation of excised samples

All excised surgical specimens were inked before routine cutting and procession.

hematoxylin and eosin stained sections from formalin fixed and paraffin-embedded sections were examined and evaluated in Pathology Department, Faculty of Medicine, Zagazig University. Description of tumor size, number, histopathological subtype and grade was done. Evaluation of the state of the surgical margins is the most important parameter.

Free surgical margin is defined as no tumor about 0.5 mm or more from the tumor, close margin means tumor less than 0.5 cm from the cut point of the specimen while positive margins mean presence of tumor at the cut point of the tumor.

We calculated volume of removed tissues by multiplication of values of length, width, and height of each specimen.

Evaluation of post-operative outcome variables

We assessed the following data post-operatively in order to assess the outcome.

Resection volume of the specimen, size of resection margins, post-operative complications as necrosis, soft tissue hematomas, collection and wound healing problems.

Data collection and statistical analysis

Collected operative, postoperative and histopathological data from the two included groups were compared regarding volume of the excised specimen and the surgical margins status. We analyzed data using the software SPSS 23.0 (IBM, Armonk, NY, USA), and we applied t-test, chi squared test and Fisher's

exact test for comparison between studied variables. We considered a significant statistical difference when $P < 0.05$.

RESULTS

Demographic, clinical and pathological results: Tables 1 and 2, Figures 1 and 2

We showed that patients underwent OBS were younger than CBS group and the difference was statistically significant ($p=0.009$). OBS was more frequently performed for tumors in the lower quadrants ($p=0.001$). No statistically significant differences were found between both groups regarding; size of the tumor, histopathological subtype, grade, T stage, number of dissected and positive lymph nodes and hormonal receptors positivity.

Correlations between both groups regarding operative and outcome findings

We found no statistically significant differences between both groups regarding operative and post-operative complications as wound healing problems, hematoma and tissue necrosis.

Operative time was longer in OBS group than in CRB ($p=0.004$). Surgical safety margins and volume of excised tissues were significantly larger in OBS group than in CBS group ($p=0.001$).

Patients' satisfaction was higher in OBS group than in CBS group ($p < 0.001$).

Re-excision rate

We found a lower rate for re-excision and completion mastectomy in OBS group than in CBS group ($p=0.001$).

Table 1. correlations between oncoplastic breast surgery (OBS) and Conservative breast surgery (CBS) regarding demographic and clinical parameters

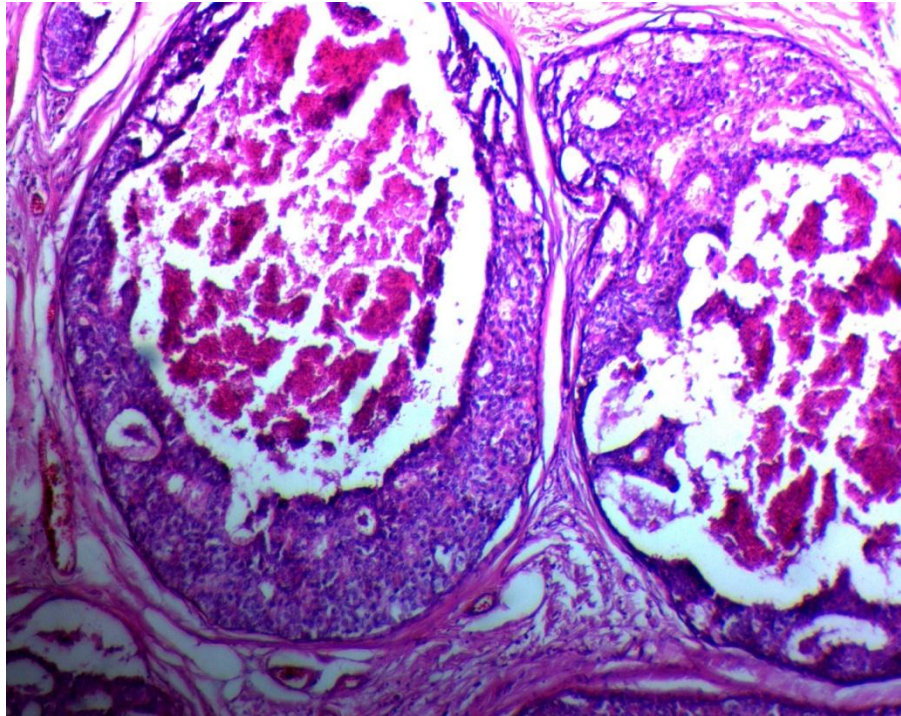
Variables	Total N=120 (%)	Surgical techniques		p
		OBS N=45 (%)	CBS N=75 (%)	
		Age groups: <50 years old >50 years old	80 (66.7) 40 (33.3)	
Comorbid condition: Absent Present	100 (83.33) 20 (16.77)	40 (88.9) 5 (11.1)	60 (80) 15 (20)	0.068
Size of mass (cm): < 3 cm ≥ 3 cm	80 (66.7) 40 (33.3)	18(40) 27 (60)	62(82.7) 13 (17.3)	0.049
Site: LUQ LLQ MUQ MLQ Central	35 (29) 30 (25) 20 (16.7) 20 (16.7) 15 (12.6)	5 (11) 20 (44) 5 (11) 10 (22) 5 (11)	30 (40) 10 (13) 15 (20) 10 (13) 10 (13)	0.001
Method of biopsy True cut Open biopsy	100 (83.3) 20 (16.7)	40(88.9) 5 (11.1)	60 (80) 15 (20)	0.002

Table 2. correlations between oncoplastic breast surgery (OBS) and Conservative breast surgery (CBS) regarding pathological parameters

Variables	Total N=120 (%)	Surgical techniques		p
		OBS N=45 (%)	CBS N=75 (%)	
		Histopathological type: IDC ILC Other	85 (70.8) 20 (16.7) 10 (9.5)	
Grade: I II III	28 (23.3) 60(50) 32 (26.7)	12 (26.7) 22 (48.8) 11 (24.5)	16 (21.3) 38 (50.7) 21 (28)	0.47
Stage: I II III	18 (15) 62(51.7) 20 (16.7)	7 (15.6) 24 (53.3) 9 (20)	9 (12) 38 (50.7) 11 (14.7)	0.332
Margin status: Free Invaded	102 (85) 18 (15)	40 (88.9) 5(11.1)	62 (82.6) 13 (17.3)	0.001

Table 3. correlations between oncoplastic breast surgery (OBS) and Conservative breast surgery (CBS) regarding postoperative complications and patient outcome (recurrence and death):

Variables	Total N=120 (%)	Surgical techniques		p
		OBS N=45 (%)	CBS N=75 (%)	
Operation time: Mean ± SD	168.33±52.68	200.07± 26.47	159.6±42.81	0.004
Postoperative complication:				
Absent	90 (75)	43 (95.6)	47 (62.7)	0.651
Present	30 (25)	2 (0.4)	28 (37.3)	
Patients satisfaction:				
Absent	80 (66.7)	45 (100)	35 (46.7)	<0.001**
Present	40 (33.3)	0 (0)	40(53.3)	
Recurrence:				
Absent	110 (91.7)	43 (95.6)	67 (89.3)	0.002*
Present	10 (0.8)	2 (0.4)	8 (10.7)	
Death				
No	110 (91.7)	43 (95.6)	67 (89.3)	0.005*
Yes	10 (0.8)	2 (0.4)	8 (10.7)	

**Figure 1.** Intra-ductal carcinoma of comedo, solid and micropapillary subtype, hematoxylin and eosin stain x400

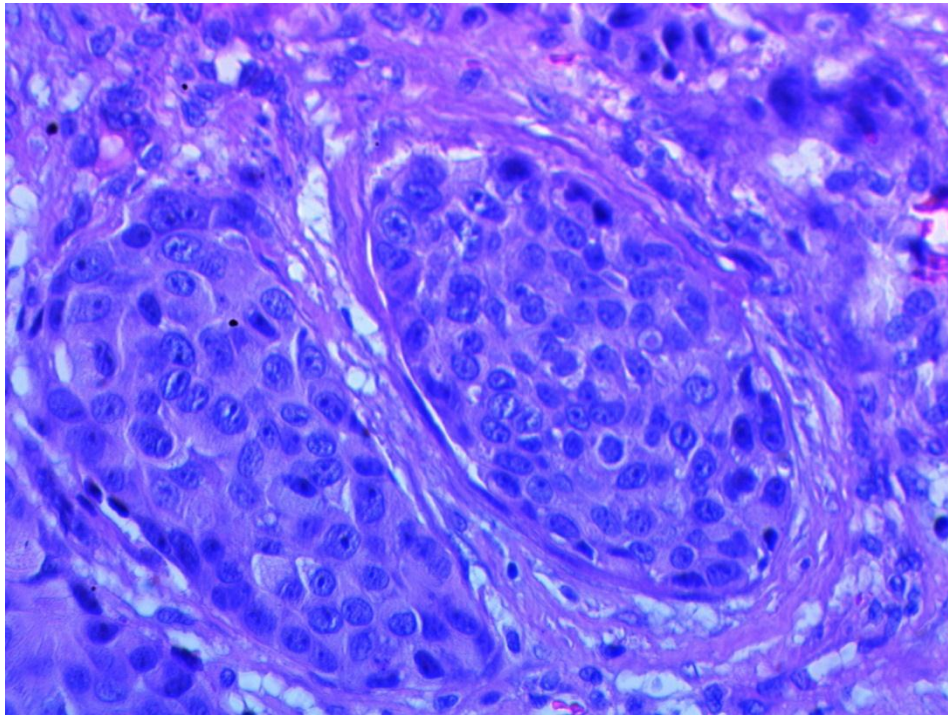


Figure 2. Invasive duct carcinoma of no special type showed infiltration of the stroma with malignant ductal epithelial cells surrounded by desmoplastic reaction; hematoxylin and eosin stain x400

DISCUSSION

Recently management strategies changed from radical approaches to conserving techniques which allow removal of the tumor tissue with preservation of the normal non-diseased tissues as possible. Additionally, many attempts were directed toward achieving the desired oncological results by removing the tumor with sufficient safety margins in addition to get better cosmetic appearance and improve patients' quality of life [2].

Many reports showed that oncoplastic approaches have many accepted therapeutic results as better cosmetic outcome, high incidence of establishing free safety margins, high levels of patients' satisfaction, high degree of surgical safety in addition to higher liability of conservation of the breast [7-10]. Moreover, OBS has the advantage of avoidance the need for correction of secondary surgical deformities that resulted in delayed wound healing particularly after application of postoperative radiotherapy [11].

There are still many oncologic surgeons prefer the traditional CBS approaches more than the OBS, so in the current study we compared

between CBS and OBS as two management procedures for primary breast cancer in females patients [1, 2].

As OBS is less frequent procedure than CBS so included patients in OBS group are less than CBS group, similarly **Behluli et al., [1]** and **Down et al., [12]**.

We showed that operative time was longer in OBS group than in CRB which denotes additional needed time to perform oncoplastic surgery. We showed that OBS allows removal of a large volume of resected tissue and wider resection margin than CBS which were in line with results of **Behluli et al., [1]**. As the uninvaded margins is the most important parameter in oncological safety [13], our results show that due to higher incidence of free safety margins and larger resection volumes so the incidence of re-excision is lower in OBS than in CBS. We did not find significant differences in rates of post-operative complications, similarly **Behluli et al., [1]** and **Nisiri et al., [2]**. Previous authors found an increase in post-operative fat necrosis in OBS [10]. We did not find an association of OBS with skin or fat necrosis. To describe associations between

occurrence of skin necrosis and operative parameters, there is a need to perform future studies regarding correlation between time of operation and occurrence of skin complication in OBS. Similar results were also obtained a study conducted by **Matrai et al., [14]**, in their comparative study between cases underwent OBS and CBS they showed that tumor size, regional lymph nodes metastasis, and adjuvant chemotherapy were higher in the OBS group than the other group. Additionally, **Nisiri et al., [2]**, showed a longer time of surgery, less incidence of post-operative complications and fewer incidences of positive margins in the OBS group.

An important result that we have reached in our study, that post-operative cosmetic outcome, as showed by post-operative examination and degree of patients' satisfaction, was better in the OBS group in comparison with CBS group. Similarly **Nisiri et al., [2]**, study, showed that degree of post-operative pain in shoulders, and chest was lower in the oncoplastic group.

All these previous researchers and our results showed the benefits of OBS in curative surgery of breast cancer even for huge tumor size and it leads to less complications and no delay in using post-operative adjuvant therapies; so decreasing tumor recurrence risk of recurrence in addition to better cosmetic appearance [14]. The degree of positive margin is less in OBS than in CBS it increased with increasing stage of cancer, lymphovascular invasion and lymph nodes metastases [15]. Another advantage of OBS is decreasing the rate of second surgery due to positive margins or recurrence later on [16].

In cases with positive margins we used radiotherapy for patients who refused second surgery which was similar to **Behluli et al., [1]**, who proposed to give cases radiotherapy instead of second surgery and they reported no recurrence in the period of 2 years of follow-up.

In this study we have compared between OBS and CBS regarding operative outcomes, surgical margins, postoperative complications and patient satisfaction and we showed that

OBS as a management method of breast cancer has an essential role in reducing incidence of positive margin thus decreasing incidence of recurrence in addition to markedly improving post-operative cosmetic appearance in comparison to CBS.

CONCLUSIONS

We have confirmed safety and feasibility of OBS more than CBS, in addition to reducing rate of post-operative complication, positive margins, tumor recurrence and the need of reoperation later on. We showed also that OBS produced a better cosmetic appearance and a higher patient's satisfaction than the conventional methods of CBS.

We proposed that OBS is better to be an established surgical approach in management of primary non metastasizing breast cancer particularly in young patients.

Conflict of interest: Nothing to declare.

Financial disclosure: Nothing to declare.

REFERENCES

1. **Behluli I, Le Renard PE, Rozwag K, Oppelt P, Kaufmann A, Schneider A.** Oncoplastic breast surgery versus conventional breast-conserving surgery: a comparative retrospective study. *ANZ J Surg.* 2019; 89: 1236–1241.
2. **Nisiri A, Pour RO, Zadeh HM, Ramim T.** Comparison of Surgical Margin After Breast Cancer Surgery Between Oncoplastic Technique and Conventional Breast-Conserving Surgery *Int J Cancer Manag.* 2018; 11(4): e9696.
3. **Kaur N, Petit JY, Rietjens M, Maffini F, Luini A, Gatti G, et al.** Comparative study of surgical margins in oncoplastic surgery and quadrantectomy in breast cancer. *Ann Surg Oncol.* 2005; 12(7): 539–545.
4. **Macmillan RD, James R, Gale KL, McCulley SJ.** Therapeutic mammoplasty. *J. Surg. Oncol.* 2014; 110: 90–95.
5. **Fitoussi AD, Berry MG, Famà F et al.** Oncoplastic breast surgery for cancer: analysis of 540 consecutive cases [outcomes article]. *Plast. Reconstr. Surg.* 2010; 125: 454–462.
6. **Macmillan RD, McCulley SJ.** Oncoplastic breast surgery: what, when and for whom? *Curr. Breast Cancer Rep.* 2016; 8: 112–117.
7. **Barnea Y, Inbal A, Barsuk D, Menes T, Zaretski A, Leshem D, et al.** Oncoplastic reduction using the vertical scar superior-medial pedicle pattern

- technique for immediate partial breast reconstruction. *Can J Surg.* 2014; 57(4):E134–140.
8. **Losken A, Ghazi B.** An update on oncoplastic surgery. *Plast. Reconstr. Surg.* 2012; 129: 382e–383e.
 9. **Peled AW, Sbitany H, Foster RD, Esserman LJ.** Oncoplastic mammoplasty as a strategy for reducing reconstructive complications associated with postmastectomy radiation therapy. *Breast J.*
 10. **Tenofsky PL, Dowell P, Topalovski T, Helmer SD.** Surgical, oncologic, and cosmetic differences between oncoplastic and nononcoplastic breast conserving surgery in breast cancer patients. *Am. J. Surg.* 2014; 207: 398–402.
 11. **Indications NMY.** Benefits of oncoplastic breast surgery. In: Losken A, Hamdi M (eds). *Partial Breast Reconstruction: Techniques in Oncoplastic Surgery.* St. Louis, MO: Quality Medical Pub, 2009; 191–201.
 12. **Down SK, Jha PK, Burger A, Hussien MI.** Oncological advantages of oncoplastic breast-conserving surgery in treatment of early breast cancer. *Breast J.* 2013; 19: 56–63.
 13. **Audretsch W.** The oncoplastic reduction approach to breast conservation therapy: benefits for margin control. *Aesthet. Surg. J.* 2014; 34: 1192–1197.
 14. **Matrai Z, Gulyas G, Kovacs E, Sandor Z, Polgar C, Bartal A, et al.** Oncoplastic versus conventional breast conserving surgery. A comparison of clinicopathological findings, cosmetic results and quality of life in 60 cases. *Magy Onkol.* 2014; 58(2):116–127.
 15. **Laucirica R.** Intraoperative assessment of the breast: guidelines and potential pitfalls. *Arch Pathol Lab Med.* 2005; 129(12):1565–1574.
 16. **Chakravorty A, Shrestha AK, Sanmugalingam N, Rapisarda F, Roche N, Querci Della Rovere G, et al.** How safe is oncoplastic breast conservation? Comparative analysis with standard breast conserving surgery. *Eur J Surg Oncol.* 2012; 38(5):395–398.

Cite This Article - VANCOUVER Style

Heggy, I., Biomy, T., ALABIAD, M., Shazly, S., Almoregy, A. Primary breast cancer management, Conservative breast surgery versus oncoplastic breast surgery, a comparative study. *Zagazig University Medical Journal*, 2020; (937-944): -. doi: 10.21608/zumj.2020.32056.1874