



Assessment of inferior pedicle therapeutic mammoplasty as part of volume displacement techniques of oncoplastic breast surgery for early breast cancer

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Abstract

Background: The current gold standard for treating breast cancer is a combination of radiation and breast oncoplastic treatments. When treating malignancies in the top quadrants of big, ptotic breasts, inferior pedicle mammoplasty allows for extensive quadrantectomies to be conducted without changing the breast's natural shape or reducing the amount of breast volume that may be irradiated. Aesthetically attractive tumor removal with substantial safety margins is the goal of therapeutic mammoplasty.

The aim of this study: Its purpose is to treat early-stage breast cancer in women with big breasts using the inferior pedicle therapeutic mammoplasty technique.

Methods: This research comprised fifteen large-breasted women who were diagnosed with early breast cancer during the months of June 2019 and June 2021.

Results: The patients' ages varied from 31 to 57 years (median 49.7), and the tumor sizes ranged from one to three and a half centimeters. The weight of the excised tissue ranged from 350 grams to 780 grams, while the tumor safety margins varied between three and eight centimeters. A patient had a straightforward mastectomy because to the presence of infiltrative margin measuring 7.14%. The most frequent consequences after surgery are inflammation and wound infection, affecting two patients (14.28%). In one instance (7.14%), cancer recurred and required a broad local incision. Out of the total number of patients, 10 individuals (71.4%) had an exceptional cosmetic outcome. One patient (7.1%) had good results, while two patients (14.3%) reported passable outcomes. Unfortunately, one patient (7.1%) experienced a negative result. The duration of the follow-up period ranges from 6 to 42 months.

Conclusion: The use of the inferior pedicle therapeutic reduction mammoplasty technique is a safe and effective surgical treatment for treating early breast cancer in women with big breasts. This operation not only addresses the oncological aspects but also provides a pleasing cosmetic result.

Keywords: Breast Cancer; Oncoplastic breast surgery; Inferior pedicle therapeutic mammoplasty

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Introduction

The surgical treatment of breast cancer has historically been classified into two main

categories: Tumor removal with a margin of safety (known as breast-conserving surgery) and complete

removal of the breast astectomy), with or without subsequent reconstruction.⁽¹⁾

From well-executed randomized controlled trials, there is compelling level one data that demonstrates the safety of breast conserving surgery (BCS) in terms of oncology. These studies indicate that BCS is equivalent to mastectomy in terms of survival. Approximately 20% to 30% of individuals undergoing routine breast conservation treatment had unsatisfactory esthetic outcomes. (2)

Patients with macromastia who undergo breast conservation therapy have increased difficulties and worse cosmetic outcomes due to the uneven distribution of radiation dosage and insufficient positioning of the breast during treatment sessions.(3)

By using known breast reduction techniques, such as volume displacement or replacement, the maximum amount of tissue that can be extracted is achieved. This approach ensures excellent local control and optimizes the cosmetic results.(4)

Therapeutic mammoplasty is advised for women whose tumor is situated inside the excision pattern of a prior breast reduction surgery and who seek improved symmetry.(5)

The aim of this study: The use of the inferior pedicle therapeutic mammoplasty is recommended for individuals with big breasts who have early breast tumors located in the upper quadrants.

Patients and Methods

This research included 15 women with big breasts who had early-stage breast cancer in the upper quadrant. The study took place in the outpatient clinic of the Mansoura Oncology Center between June 2019 and June 2021. All of the patients satisfied the standard criteria for breast conservative treatment. Oncologic exclusion criteria included multicentric carcinoma, inflammatory breast cancer, challenges in achieving tumor-free margins despite reasonable efforts, and contraindication to radiation. Non-oncologic exclusion considerations included small breast size, comorbidities, and the patient's desire. Prior to the operation, all patients were provided with detailed information about the sequential stages involved, and their agreement, based on this information, was duly acquired. (table1) Provide a concise overview of the patients' and tumor features.

Table 1: patients and tumour characteristic

Patients age(year)	
Range	31-57
Median	49.7
Tumour pathology	
Invasive ductal carcinoma	15
Tumour stage	
pT1	4
pT2	8
pT3	3
pN0	12
pN1	3
Grading	
G2	12
G3	3
Tumour location	
Upper pole	11
Central	4

While the patients is in an upright position, preoperative marks are made. For all cases, the inferior pedicle was employed. (**figure 1**).

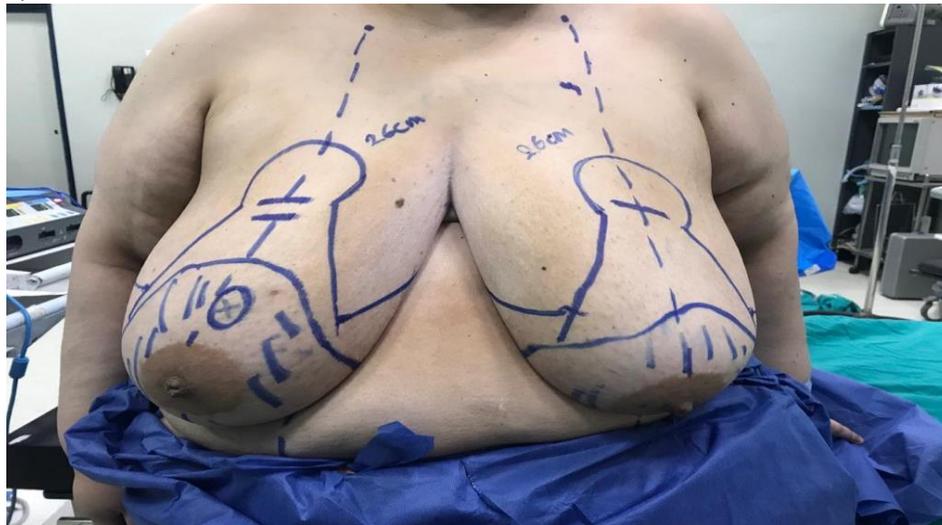


Figure 1: preoperative marking of inferior pedicle

During the surgery, the tumor was removed first via the incision that was planned before the operation to ensure the most effective removal for cancer treatment. The excised tissue was then frozen and examined in sections to see whether the margins were clear of cancer cells. Clips were used to indicate the location of the tumor bed.

The skin in the lower portion of the breast was stripped of its outer layer, while the width of the lower attachment point was maintained at a

measurement more than 8 cm. Additionally, the tissues on both sides of the attachment point were surgically removed. The flaps are brought together using interrupted and continuous 3-0 absorbable monofilament sutures, starting from the inframmary fold and continuing down the vertical incision. A circular defect is formed in the midline at the highest point of the breast. The therapy is concluded by suturing the areola into its designated position (**figure 2**).

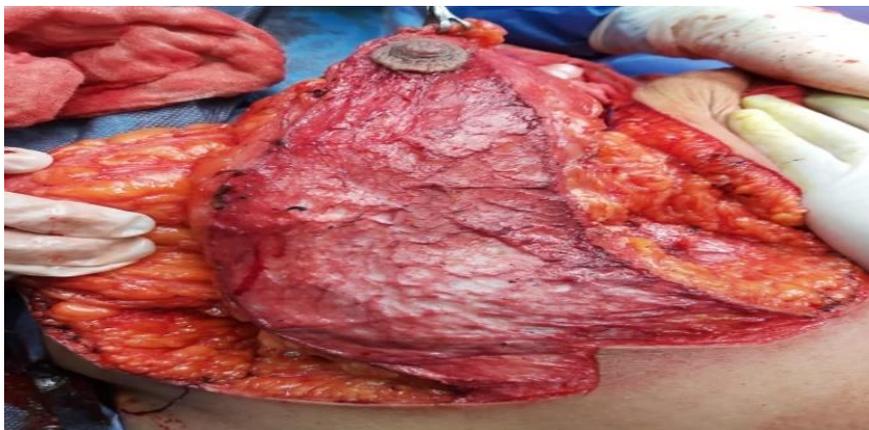


Figure2: De-epithelialization of the dermoglandular flap.

To cleanse the axilla and remove layers 1 and 2, a distinct transverse incision was made along the axillary hairline. During our investigative series, we started the procedure by addressing the affected

breast and then replicated the therapy in the opposite breast to get a balanced appearance, while ensuring that the tumor was completely removed with adequate safety margins (**figures 3, and 4**).



Figure3: postoperative view



Figure 4: postoperative view after one week.

All patients were sent to the clinical oncology and nuclear medicine department based on the stage of their tumor. There, they received radiation and adjuvant chemotherapy. Evaluation (**table 2**):

Table 2: overall complication rate

Complication	Numbers
Inflammation and dermatitis	1 patient (7.14%)
Wound infection	1 patient (7.14%)
Infiltrated margins	1 patient (7.14%)
Recurrence	1 patient (7.14%)

2.1 Procedure related complications:

The patients were monitored for wound infection, wound dehiscence, nipple and areola necrosis, and

hematoma formation during their hospitalization time, which might be up to 6 days .

Over the course of one month, patients who had postoperative complications were monitored at their outpatient appointments. Wound infections and axillary and breast seroma that wouldn't go away were among these problems.

2.2 Aesthetic Outcome:

6 months after the operation, a simple scoring method was used for the postoperative cosmetic evaluation; the results were recorded as an average score. A grading system was used to evaluate the scores. A number of elements were considered in the evaluation, such as the ipsilateral and contralateral aspects, the shape of the breast, and the symmetry of the NAC placement. On the specified rating system, where 5 signifies excellence, 4 goodness, 3 sufficient, 2 terrible, and 1 really poor, the outcome was a 5 out of 5, signifying an amazing performance.⁽⁶⁾

2.3 Oncologic Outcome:

In outpatient clinics, we made sure that all patients were screened for local recurrence. Following up was every two weeks for the first month, then once a month for the next six, once every three months for the next twelve months, once every six months for the next two years, and finally once a year. Mammography was done once a year, and a bilateral breast ultrasound was done every three to six months. After mammography revealed concerning results, MRI was conducted.

Results

The patients' ages ranged from 31 to 57 (median 49.7). All of the patients had tumours in the upper pole and central part of breast. The tumors ranged in size from 1 to 3.5 cm. infiltrating ductal carcinoma was found in all of the patients. The weight of removed tissues ranged from 350 g to 780 g. the tumor safety margins varied from 3 to 8 cm.

Only one patient had infiltrated margin at frozen section after 2 attempts of excision and mastectomy was performed (conversion rate was 7.14%).

Inflammation, dermatitis and wound infection were the postoperative complication and affect two patients (13.3%) . they are managed conservatively by antibiotic and anti-inflammatory drugs.

The cosmetic outcome was assessed six months after the surgery. Out of the total number of

patients, 10 individuals (71.4%) had an exceptional cosmetic outcome. One patient (7.1%) had good results, while two patients (13.3%) reported passable outcomes. Unfortunately, one patient (7.1%) experienced a negative result. After 18 months after the operation, a single patient had a local recurrence without any spread to other parts of the body. The patient underwent a broad local excision and was then sent to medical oncology and nuclear medicine for further treatment. Throughout the remaining fourteen patients' 6-42 month follow-up period, no local recurrence nor systemic metastases were seen.

Discussion

Patients with large pendulous breasts face several drawbacks when considering traditional treatment options such as mastectomy or breast conservation therapy. These drawbacks include challenges for radiation oncologists when breast conservation is chosen, as well as unsatisfactory and uncomfortable asymmetry resulting from unilateral mastectomy. While breast conservation with negative margins is feasible in this group of women with macromastia, it is important to note that there are potential consequences including prolonged radiation-induced pain, fibrosis, and a suboptimal esthetic result after radiotherapy.⁽⁷⁾

Oncoplastic surgery has shown efficacy in achieving cancer-free outcomes, exhibiting recurrence, metastasis, and mortality rates that are equivalent to those of breast conserving surgery.⁽⁸⁾

Reduction mammoplasty is the most effective treatment option for individuals with significant macromastia, leading to improved treatment outcomes and quality of life. Due to the more uniform radiation therapy received by the new, smaller breast, it is crucial to thoroughly assess it in this specific group of patients.⁽⁹⁾

This research used the technique of inferior pedicle reduction therapeutic mammoplasty to address early-stage breast cancer in patients with voluminous breasts. We assert that this approach is comparatively more conservative and less drastic in nature.

Gulcelik *et al.* The surgeon conducted therapeutic mammoplasty on 101 patients who had breast

cancer and macromastia. The majority of the patients underwent the procedure using the inferior pedicle technique. The surgeon observed the following postoperative complications: 5 cases of seroma (5%), 2 cases of hematoma (2%), 3 cases of surgical site infection (3%), 3 cases of minor incisional dehiscence (3%), 4 cases of delayed wound healing (4%), 1 case of areola necrosis (1%), and 1 case of major wound dehiscence (1%).⁽¹⁰⁾

One patient in this study developed an infection in their wound, and another patient had inflammation and dermatitis. Both patients accounted for 7.14 percent of the total cases. A little triangle of skin was kept in the middle, above the inframammary fold, to avoid a delayed inverted-T-incision wound. The most often reported complications after therapeutic mammoplasty, according to Fitzel et al., include wound dehiscence and skin necrosis.⁽¹¹⁾

Munhoz *et al.* A study found that using the inferior pedicle technique for tumors placed superiorly resulted in immediate problems in 17.6% of cases. These consequences included 8.1% skin necrosis, 2.7% infection, 2.7% partial necrosis of the nipple-areolar complex (NAC), 1.35% wound dehiscence, and 1.35% entire necrosis of the NAC. Patients who were obese and smokers had a notably elevated incidence of problems.⁽¹²⁾

If clean margins cannot be achieved, breast conservative treatment is not advisable. The current study observed a conversion rate of approximately 7.14% to mastectomy. Conversion was determined after two instances of involved margin at frozen section.⁽¹³⁾ McCully and McMillan conducted a study on a group of 50 patients who had therapeutic mammoplasty. Out of these patients, 4 individuals (8%) needed to have a second surgery because the surgical margins were affected.⁽¹⁴⁾

Our research revealed that 71.4% of participants had an exceptional esthetic outcome. Chang et al. assessed the level of satisfaction and cosmetic outcomes, with 70% of participants reporting outstanding results.⁽⁹⁾ Goffman documented the assessment of fifty-five patients by a diverse panel consisting of a surgical oncologist, an oncology nurse, a radiation oncologist, and a patient. The assessments yielded excellent and very good outcomes in 72% of the cases.⁽¹⁵⁾ The present series had a recurrence rate of 7.14%, which was limited

to the local area and did not extend to other regions. Kronowitz documented a 5% occurrence of local recurrence after an average monitoring period of 36 months.⁽¹⁶⁾ Losken has reported a reduced rate of 2% after an average follow-up of 40 months. He suggests that younger patients with extensive ductal carcinoma in situ (DCIS) are not suitable for simultaneous reconstruction and should wait until negative margins are confirmed. Based on his observations, the oncoplastic technique was unsuccessful in all four patients who needed to have complete mastectomy with reconstruction. These patients were younger and had a significant DCIS component. Despite a negative specimen radiograph test, a definitive pathology analysis revealed positive margins.⁽¹⁷⁾

The total percentage of local control was 87%, according to Goffman's observations. The local control rate was 96% in patients who made it to the radiation stage without suffering from distant or local failure. Results showed that a median of 19 months had passed since the study began.⁽¹⁵⁾

Conclusion

A safe and successful surgical therapy for early breast cancer in women with enormous breasts is the use of the inferior pedicle therapeutic reduction mammoplasty procedure. This procedure takes care of the cancer while also improving the patient's appearance.

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