



Our Experiences with Batwing Mamoplasty in Centrally Placed Breast Tumors

Santral Yerleşimli Meme Tümörlerinde Batwing Mamoplasti Deneyimlerimiz

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ABSTRACT

Aim: The aim of this study is to investigate the effectiveness of the batwing mamoplasty technique in centrally located breast tumors.

Materials and methods: This is a single-center, observational clinical trial retrospectively examining the data of 27 patients diagnosed with centrally located breast cancer and who underwent batwing mamoplasty between April 2023 and January 2025. Patients were followed up for 6 months postoperatively.

Results: No postoperative death or morbidity was observed. The mean age of the patients was 56.63±13.69 years. Their mean weight was 73.8±12.9 kg. While 12 patients (44.4%) had no systemic disease, 9 patients (33.3%) had hypertension, 8 patients (29.6%) had diabetes, 5 patients (18.5%) had both hypertension and diabetes, and 3 patients (11.1%) had COPD and asthma. Four patients (23.6%) were premenopausal, and 13 patients (76.4%) were postmenopausal. Seven patients (26%) were premenopausal, and 20 patients (74%) were postmenopausal. Nine patients (33.3%) were smokers. The mean tumor diameter was 26±8 mm. Pathology results were reported as 18 (66.7%) invasive ductal carcinoma, 2 (7.4%) invasive lobular carcinoma, 4 (14.8%) Paget's disease of the breast, 1 (3.7%) phyllodes tumor, and 2 (7.4%) neuroendocrine carcinoma. Tumor staging was 13 (48.1%) stage 1, 10 (37.1%) stage 2, and 4 (14.8%) stage 3. Two patients (7.4%) developed hematomas, and both patients experienced wound infection. One patient (3.7%) developed flap necrosis and underwent reoperation. Following adjuvant treatment, breast edema and cellulitis developed in two patients (7.4%).

Conclusion: Despite the small number of patients in this 3-year series, the batwing mamoplasty technique yielded positive results in postoperative wound healing. The ease of learning curve and application technique, along with the fact that surgical recovery times do not cause delays in adjuvant treatments, makes it a good option for centrally located breast tumors.

Key words: batwing mamoplasty; breast cancer; breast conserving surgery; oncoplastic surgery

ÖZET

Amaç: Bu çalışmanın amacı santral yerleşimli meme tümörlerinde batwing mamoplasti tekniğinin etkinliğini araştırmaktır.

Gereç ve Yöntem: Nisan 2023 ile Ocak 2025 tarihleri arasında santral yerleşimli meme kanseri tanısı konan ve batwing mamoplasti tekniği uygulanmış 27 hastanın verilerinin retrospektif olarak incelendiği, tek merkezli, gözlemsel bir klinik araştırmadır. Hastalar postoperatif dönemde altı ay boyunca takip edilmiştir.

Bulgular: Postoperatif ölüm veya morbidite görülmemiştir. Hastaların ortalama yaşı 56,63±13,69 yıldır. Ortalama ağırlıkları 73,8±12,9 kg'dır. On iki hastanın (%44,4) sistemik hastalığı yokken, dokuz hastada (%33,3) hipertansiyon, sekiz hastada (%29,6) diyabet, beş hastada (%18,5) hipertansiyon ve diyabet, üç hastada (%11,1) KOAH ve astım bulunmaktadır. Dört hasta (%23,6) premenopozal, 13 hasta (%76,4) hasta post menopozal dönemdedir. Yedi hasta (%26) menopoz öncesi dönemde, 20 hasta (%74) menopoz sonrası dönemdedir. Dokuz hastanın (%33,3) sigara kullanımı mevcuttur.

Tümör çapı ortalama 26±8 mm'dir. Patoloji sonuçları 18 (%66,7) invaziv duktal karsinom, iki (%7,4) invaziv lobüler karsinom, dört (%14,8) memenin paget hastalığı, bir (%3,7) phillodes tümör ve iki (%7,4) nöroendokrin karsinom olarak raporlanmıştır. Tümör evresinde 13 (%48,1) Evre 1, 10 (%37,1) Evre 2 ve 4 (%14,8) Evre 3'tür. İki hastada (%7,4) hematoma gelişti ve bu hastaların her ikisinde de yara yeri enfeksiyonu görüldü. Bir hastada (%3,7) flep nekrozu gelişmişti ve yeniden opere edildi. Adjuvan tedavi sonrası iki hastada (%7,4) memede ödem ve selülit gelişmiştir.

Sonuç: Üç yıllık seride hasta sayısının az olmasına rağmen batwing mamoplasti tekniği cerrahi sonrası yara yeri iyileşmesinde olumlu sonuçlar vermiştir. Öğrenme eğrisinin ve uygulama tekniğinin zor olmaması, cerrahi iyileşme sürelerinin adjuvan tedavilerde gecikmeye sebep olmaması merkezi yerleşimli meme tümörlerinde iyi bir seçenek olarak karşımıza çıkmaktadır.

Anahtar kelimeler: batwing mamoplasti; meme kanseri; meme koruyucu cerrahi; onkoplastik cerrahi

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Introduction

Breast cancer is the most common type of cancer among women both globally and in our country. The American Cancer Society (ACS) 2022 estimates reported that 287,850 women would be diagnosed with breast cancer and 43,250 women would lose their lives due to the disease (1). According to data from the International Agency for Research on Cancer (IARC), a sub-organization of the World Health Organization (WHO), there were 24,175 women newly diagnosed with breast cancer in our country in 2020 (2). A study conducted in our country in 2019 stated that approximately 4,300 women died due to breast cancer (3). In light of all these data, breast cancer represents a significant public health problem worldwide and in Türkiye.

Despite its increasing prevalence, breast cancer has the best prognosis among common cancer types. National screening programs for early diagnosis and expanding treatment options play a crucial role in the fight against breast cancer. When examining the evolution of surgical treatment, the process—which began with the removal of breast and axillary lymph nodes along with chest wall muscles—has evolved into techniques aimed at preserving breast tissue with lower morbidity and mortality. While the primary goal of surgery remains the removal of cancerous tissue, aesthetic objectives have also become a fundamental principle of modern surgery.

Breast-conserving surgery (BCS) is a well-known management approach for early-stage breast cancer and is considered the standard surgical technique today (4). Studies have indicated that BCS followed by radiotherapy has similar recurrence and survival rates similar to those of modified radical mastectomy (MRM) (5).

Today, oncoplastic surgery is defined as a technique that combines oncological and aesthetic surgical principles. Clough et al. classified oncoplastic techniques into two groups based on their level of difficulty (6). Level 1 techniques are characterized by ease of application and a short learning curve, while Level 2 techniques are more complex and difficult. Batwing mammoplasty is one of the Level 1 oncoplastic techniques. It is a technique applicable to upper quadrant tumors located between 3 and 9 o'clock and for breast tumors involving the nipple-areola complex. The literature contains publications reporting good oncological and aesthetic results for upper quadrant tumors (7,8). The aim of this study is to investigate the efficacy of the batwing mammoplasty technique in central breast tumors

Material and Methods

Patient Selection

Between April 2023 and January 2025, 352 breast cancer operations were performed in our clinic. Of these patients, 136 underwent Modified Radical Mastectomy (MRM), 103 underwent conventional Breast-Conserving Surgery (BCS), and 113 underwent oncoplasticsurgical techniques. Batwing mammoplasty was performed on 27 patients with central breast tumors involving the nipple-areola complex, and these patients were included in the study. Demographic characteristics of the patients are provided in Table 1. All patients, regardless of prior anticoagulant use, received 40 mg of subcutaneous enoxaparin sodium 5 days before surgery. Enoxaparin treatment was continued for the first five days postoperatively; subsequently, patients who routinely used anticoagulants resumed their own medication, while treatment was discontinued for those who did not. Patients were followed for six months postoperatively.

Table 1. Tumor characteristics

	All patients (N=27)
Tumor locations	
• Right	10 (%37)
• Left	17 (%63)
Tumor size	26 ± 8 mm
Tumor histopathological type	
• Invasive Ductal Carcinoma	18 (%66.7)
• Invasive Lobular Carcinoma	2 (%7.4)
• Paget Disease	4 (%14.8)
• Phyllodes Tumor	1 (3.7)
• Neuroendocrine Carcinoma	2 (%7.4)
• Tumor Stage	
• Stage 1	13 (% 48.1)
• Stage 2	10 (%37,1)
• Stage 3	4 (%14.8)
• Axillary Lymph Nodes	
• Positive	6 (%22.2)
• Negative	21 (%77.8)

Surgical Technique

Preoperative drawings were performed for all patients in a semi-sitting position. Drawings were made to include the Nipple-Areola Complex (NAC), with a surgical margin of 2 cm from the right and left sides of the areola and 1 cm from the top and bottom (Fig 1). Following anesthesia, methylene blue was injected around the nipple; after a 10-minute wait, sentinel lymph node biopsy (SLNB) was performed through an incision along the anterior axillary line, and the

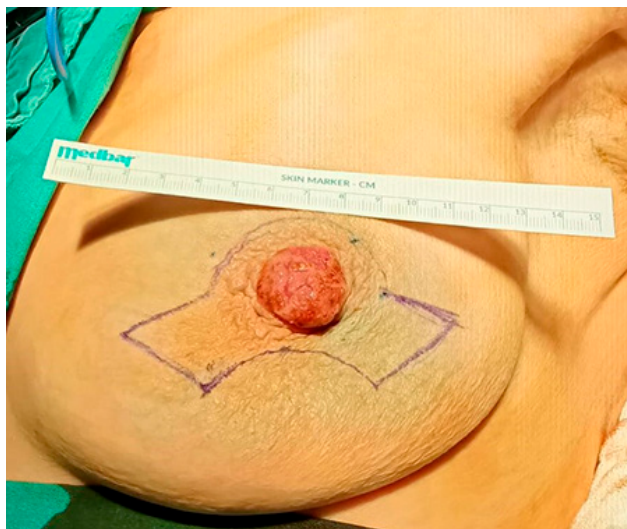


Figure 1. Preoperative drawing.



Figure 2. Post-excision appearance.

nodes were sent for frozen-section examination. The marked area was excised with clear surgical margins, extending down to the pectoralis major muscle fascia at the base (Fig 2).

Metal clips were placed to mark the base of the surgical site. Following excision, the defect was closed by advancing the fibroglandular tissue. The operation was completed by closing the subcutaneous tissue and skin (Fig 3). No drains were used in the breast operation site for any patient. Hemovac drains were used in the axilla for patients undergoing axillary dissection. All surgeries were performed by a single surgeon with eight years of experience as a general surgery specialist.

Statistical Analysis

Statistical evaluation was performed using the IBM Statistical Package for Social Sciences (SPSS) program



Figure 3. Appearance after suturing the incision.

version 20.0. The conformity of the data to a normal distribution was assessed using the Shapiro-Wilk test. Descriptive statistics were expressed as mean $\pm$ standard deviation (Mean $\pm$ SD) for normally distributed continuous variables, median (minimum-maximum) for non-normally distributed continuous variables, and number and percentage (n, %) for categorical variables. In intergroup comparisons, the Mann-Whitney U test was used as parametric assumptions could not be met for the analysis of continuous variables. For categorical variables, the Pearson Chi-Square test or Fisher's Exact Test (in cases of insufficient sample size) was applied. The significance level was accepted as $p < 0.05$ for all statistical analyses.

Ethics Committee

Ethics committee approval was obtained from the Kocaeli City Hospital Scientific Research Ethics Committee. The ethics committee approval number is 2025-109. All patients included in the study were asked to fill out a 'Visual Content Recording and Processing Consent Form' for the use of their images for scientific purposes.

Results

No mortality or morbidity was recorded during post-operative follow-up. The average age of the patients was 56.63 ± 13.69 years. The average weight was 73.8 ± 12.9 kilograms. Comorbidities included hypertension in 9 patients (33.3%), diabetes in 8 patients (29.6%), both hypertension and diabetes in 5 patients (18.5%), and chronic obstructive pulmonary disease/asthma in 3

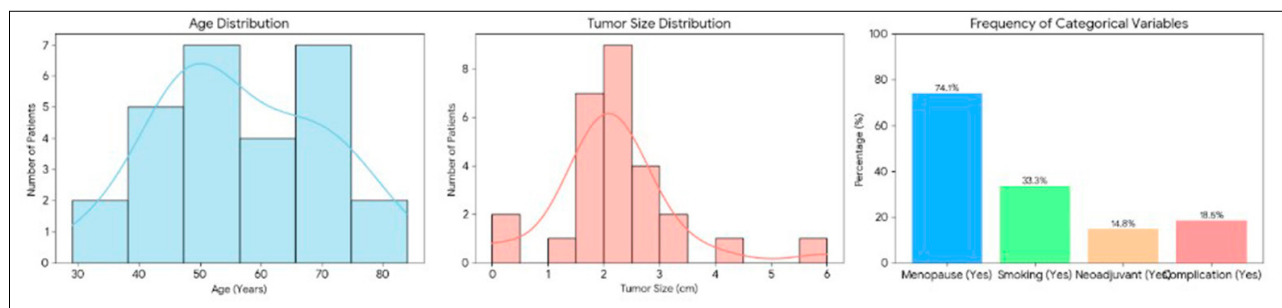


Figure 4. Demographic and clinical characteristics of patients.

patients (11.1%); 12 patients (44.4%) had no systemic disease. Regarding menopausal status, 20 patients (74%) were postmenopausal and 7 patients (26%) were premenopausal.

Of the 27 patients, 9 (33.3%) were regular smokers. Four patients (14.8%) received neoadjuvant therapy (Fig 4). Operations were performed on the right breast in 10 patients (37%) and the left breast in 17 patients (63%). No patients had bilateral breast tumors. The average tumor diameter was 26 ± 8 mm. Histopathology revealed invasive ductal carcinoma in 18 (66.7%), invasive lobular carcinoma in 2 (7.4%), Paget's disease of the breast in 4 (14.8%), phyllodes tumor in 1 (3.7%), and neuroendocrine carcinoma in 2 (7.4%). In terms of tumor stage, 13 patients (48.1%) were stage 1, 10 (37.1%) were stage 2, and 4 (14.8%) were stage 3. Sentinel lymph node biopsy was positive in 6 patients (22.2%), who then underwent axillary dissection (Table 1).

Table 2. Early and late period postoperative complications

Early Period (first 2 months)	All patients (N=27)
Hematoma	2 (%7.4)
Surgical Site Infection	2 (%7.4)
Flap Necrosis	1 (%3.7)
Re-excision	1 (%3.7)
Late Period (After the 2nd Month)	All patients (N=27)
Breast edema and cellulite	2 (%7.4)

Postoperatively, hematoma developed in 2 patients (7.4%), both of whom subsequently developed surgical site infections. Flap necrosis occurred in 1 patient (3.7%), requiring re-operation and conversion to mastectomy. Following adjuvant therapy, breast edema and cellulitis were observed in 2 patients (7.4%) (Table 2). Statistical tests comparing the groups with complications ($n=5$) and without complications ($n=22$) showed no significant differences across several variables ($p > 0.05$) (Table 3, Fig 5). There was no significant difference between the average age of those who developed complications and those who did not ($p=0.057$). No significant relationship was found between tumor diameter and the development of complications ($p=0.416$). The average diameter was 1.66 cm in the complication group and 2.29 cm in the non-complication group. No statistically significant relationship was found between menopausal status, smoking, or neoadjuvant therapy and the development of complications ($p > 0.05$).

Discussion

Many oncoplastic techniques are available in the literature. The choice of technique depends on tumor location, breast size, and involvement of the nipple-areola complex. The primary advantages of the batwing technique are its simplicity and short operation time. In a study by Hashem T et al., the average operation time for the batwing technique was reported as 103 minutes

Table 3. Intergroup analysis of complication development

Variable	Complication NO ($n=22$)	Complication ($n=5$)	p value*
Age (Average $\pm$ SS)	54.05 ± 13.01	68.00 ± 11.47	0.057
Tumor Diameter (Median [Min-Max])	2.20 [0.00–6.00]	2.00 [0.00–2.50]	0.416
Menopause (Yes)	15 (%68.2)	5 (%100.0)	0.283
Smoking (Yes)	7 (%31.8)	2 (%40.0)	1.000
Neoadjuvant Therapy (Yes)	3 (%13.6)	1 (%20.0)	1.000

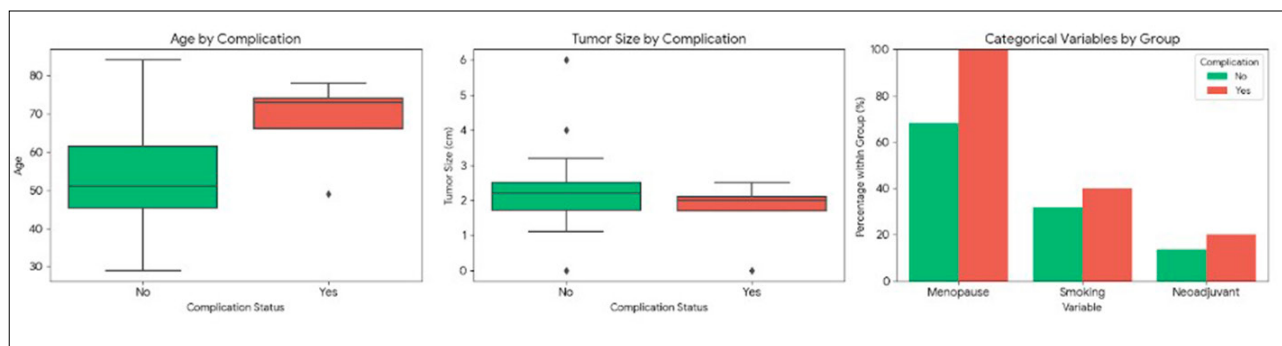


Figure 5. Intergroup analysis of complication development.

(7). In our study, duration was not recorded because all patients underwent frozen section analysis, and the duration under anesthesia was prolonged due to the pathology unit being located in a separate building.

Another key factor in the widespread adoption of oncoplastic techniques is that recent studies show a decrease in delays for starting adjuvant therapy. While Rose M et al. Reported an adjuvant therapy delay of %6, Monib S et al. reported no delay in their case series using various oncoplastic techniques (9,10). Similarly, there was no delay in adjuvant therapy in our cases.

Another significant advantage of the batwing mammoplasty technique is the ease with which it can be converted to total mastectomy if necessary. In our study, one patient developed flap necrosis and underwent total mastectomy. This flexibility is an important advantage for managing complications that may arise during the learning curve or postoperatively.

The volume of breast tissue to be reduced is another important criterion when choosing an oncoplastic technique. Since the batwing mammoplasty technique is applicable to upper-quadrant tumors, the inability to intervene in the lower quadrants limits its volume-reducing effect. This situation highlights the importance of breast volume in technique selection. In our study, postoperative complications were grouped as early-term (first 2 months) and late-term (after 2 months). The study by Hashem T et al. was used as a reference for this grouping (7). No drains were used in any patient following batwing mammoplasty. In patients who developed hematomas, puncture was performed under ultrasound (USG) guidance. Following puncture, surgical site infections developed in both patients; these were followed with dressings and subsequently closed with primary sutures.

The patient who developed flap necrosis was re-operated on the 8th postoperative day and converted to total mastectomy. The fact that this patient was a smoker and that blood glucose regulation could not be achieved postoperatively underscores the importance of systemic diseases and smoking in patient selection. In the long term, two patients developed edema and cellulitis following adjuvant therapy and were treated with anti-inflammatory drugs.

Conclusion

This study aimed to evaluate the feasibility and clinical outcomes of the batwing mammoplasty technique in centrally located breast tumors involving the nipple-areola complex. Our findings indicate that with appropriate patient selection, batwing mammoplasty is an oncoplastic surgical approach that maintains oncological safety while maintaining acceptable complication rates. Balancing the fundamental principles of breast-conserving surgery with aesthetic considerations has become an essential component of contemporary surgical practice. In this context, batwing mammoplasty emerges as a practical option that enables adequate surgical margin control together with satisfactory cosmetic outcomes, particularly in centrally located tumors involving the nipple-areola complex.

The absence of mortality and the consistency of complication rates with those reported in the literature support the safety of this technique. The manageable nature of observed complications and the need for conversion to mastectomy in only one patient suggest that the technique offers procedural flexibility, allowing transition to more radical surgery when necessary. Furthermore, the lack of delay in adjuvant therapy indicates that oncoplastic surgical approaches are compatible with multidisciplinary treatment planning and do not negatively impact the continuity of oncological care.

Tumor localization, breast volume, and patient-related comorbidities should be carefully considered during surgical planning. The observed effects of smoking and metabolic disorders on wound healing further highlight the importance of appropriate patient selection in optimizing surgical outcomes. While batwing mastoplasmy appears particularly suitable for lesions located in the upper quadrants, its applicability to lower quadrant tumors may be limited. Therefore, the choice of oncoplastic technique should be individualized according to patient and tumor characteristics.

With the evolution of oncoplastic breast surgery, treatment success is no longer defined solely by survival outcomes but also by quality of life and cosmetic results. The relatively short learning curve and the possibility of conversion to mastectomy when required suggest that batwing mastoplasmy can be effectively integrated into surgical practice. The retrospective design, limited sample size, and single-center experience represent the main limitations of this study. Larger, multi-center, prospective studies are needed to further clarify the long-term oncological and aesthetic outcomes of this technique. In conclusion, batwing mastoplasmy may be considered a safe, feasible, and cosmetically satisfactory surgical option for the management of centrally located breast tumors in appropriately selected patients.

Limitations

The most significant limitation of our study is the small sample size due to narrow inclusion criteria during patient selection.

Conflict of Interest

There is no conflict of interest.

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