Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/1jr5xt23

MASTECTOMY VS CONSERVATIVE SURGERY IN CARCINOMA BREAST

Dr Wasim Ahmad[1], Dr Junaid Iqbal[2*], Dr Waheed Ur Rehman[3], Dr Wagma Sirshar[4], Dr Shahkar Afridi[5], Dr Hamza Sardar[6]

[1]Associate Professor, Department of Surgery, Gomal Medical College, Dera Ismail Khan, Pakistan
[2*]Consultant, Department of General Surgery, Southwest Health Complex, Kohat, Pakistan
[3]District Specialist, Department of General Surgery, DHQ Hospital Miranshah, North Waziristan, Pakistan
[4]Resident Surgeon, Department of General Surgery, MTI Hayatabad Medical Complex, Pakistan
[5]Resident General Surgeon, Department of General Surgical, Hayatabad Medical Complex, Peshawar, Pakistan
[6]Medical Officer, Khyber Hospital, Mardan, Pakistan

***Corresponding author:** Dr Junaid Iqbal
*****Email: junaid_1567@yahoo.com

ABSTRACT

Background

'Breast cancer is one of the most common malignancies among women, with surgical intervention being a cornerstone of treatment'. Mastectomy and breast-conserving surgery (BCS) are widely practiced surgical options. While both approaches have shown comparable survival outcomes, differences in recurrence rates, complications, and quality of life necessitate further exploration. This study aimed to compare the oncological outcomes, post-surgical complications, and quality of life in patients undergoing mastectomy versus 'breast-conserving surgery for breast carcinoma'.

Methods

This retrospective cohort study was conducted at Gomal Medical College and its affiliated hospitals from January 2023 to January 2024. A total of 110 patients with histologically confirmed invasive breast carcinoma, stages I–III, were included. Patients were divided equally into two groups: 55 underwent mastectomy, and 55 underwent BCS. Data on recurrence, survival, complications, and quality of life were collected and analyzed using statistical methods. P-values <0.05 were considered significant.

Results

Local recurrence rates were slightly higher in the 'BCS group (7.3%) compared to the mastectomy group (5.5%), though not statistically significant (P=0.67)'. Distant metastasis rates were comparable between groups. Disease-free survival and overall survival showed negligible differences, highlighting similar oncological outcomes for both approaches. Complications such as lymphedema and chronic pain were more frequent in the mastectomy group, while quality of life scores were significantly higher in the BCS group (P=0.02).

Conclusion

Both mastectomy and BCS are effective surgical options for managing breast carcinoma, with comparable oncological outcomes. BCS offers the added advantage of better quality of life and

cosmetic satisfaction, making it an appealing choice for eligible patients. Treatment decisions should prioritize patient preferences, tumor characteristics, and access to adjuvant therapies.

Keywords: Breast cancer, mastectomy, breast-conserving surgery, oncological outcomes, quality of life, complications, recurrence.

INTRODUCTION

'Breast cancer remains one of the most prevalent malignancies among women worldwide, posing significant challenges in terms of diagnosis, treatment, and long-term care' [1]. With advancements in medical science and surgical techniques, treatment options for breast cancer have evolved significantly, offering patients a range of approaches tailored to their specific clinical needs and personal preferences[2, 3].Historically, mastectomy—the complete removal of the breast—was considered the standard treatment for breast cancer. 'However, the advent of breast-conserving surgery (BCS), which involves removing the tumor along with a margin of surrounding tissue, has revolutionized the surgical management of early-stage breast cancer' [4]. Numerous landmark studies, such as the NSABP B-06 trial, have established that BCS, when combined with radiotherapy, provides survival outcomes equivalent to mastectomy while preserving the breast, thereby improving cosmetic results and quality of life for patients[5].

Despite the evidence supporting BCS, the choice between mastectomy and BCS remains influenced by various factors, including tumor size, stage, patient preference, and availability of adjuvant therapies like radiotherapy. Moreover, considerations such as long-term oncological safety, recurrence rates, and post-treatment quality of life often weigh heavily in decision-making[6].
This study aims to compare the outcomes of mastectomy and 'breast-conserving surgery in terms of oncological safety, complications, and quality of life in patients treated for breast carcinoma at Gomal Medical College and its affiliated hospitals'. By analyzing these outcomes, this research seeks to contribute valuable insights into the optimal surgical approach for managing breast cancer in our population.

METHODOLOGY

This study was conducted at Gomal Medical College and its affiliated teaching hospitals from January 2023 to January 2024. 'It was a comparative analysis of outcomes in patients undergoing mastectomy and breast-conserving surgery (BCS) for breast carcinoma'. Ethical approval was obtained from the institutional review board before 'initiating the study, and written informed consent was secured from all participants'. The study adhered to the principles of the Declaration of Helsinki. Patient confidentiality was maintained throughout the research process. The results of the study are intended to contribute to evidence-based decision-making in breast cancer treatment.The study employed a retrospective cohort design. The sample size comprised 110 patients diagnosed with breast carcinoma and treated surgically during the study period. Patients were divided equally into two groups: 55 underwent mastectomy, and 55 underwent breast-conserving surgery. Participants were selected through non-probability consecutive sampling to include all eligible patients during the study period.

Patients included in the study were women aged 18–75 years with histologically confirmed invasive breast carcinoma, stages I to III, who had completed primary surgical treatment (mastectomy or BCS). Patients with recurrent breast cancer, distant metastases at diagnosis (stage IV), prior neoadjuvant therapy, or incomplete medical records were excluded from the study.
Clinical and demographic data were collected using a standardized data collection form. Information included age, socioeconomic status, tumor characteristics (size, histology, hormone receptor status, and stage), and treatment details (type of surgery, adjuvant therapies). Post-treatment follow-up records were reviewed to assess complications, recurrence, and survival outcomes. 'Data on quality of life and patient satisfaction were gathered using validated questionnaires such as the FACT-B scale'.

Patients in the mastectomy group underwent either simple or modified radical mastectomy. Those in the breast-conserving surgery group received wide local excision with clear margins, followed by mandatory adjuvant radiotherapy. Axillary management was determined based on clinical findings and included sentinel lymph node biopsy or axillary lymph node dissection

'Patients were followed for at least 12 months post-surgery. Oncological outcomes assessed included local recurrence, distant metastasis, disease-free survival (DFS), and overall survival (OS)'. Complications such as wound infection, lymphedema, and chronic pain were also documented. 'Quality of life assessments and patient-reported satisfaction with treatment outcomes were evaluated at follow-up visits'.Data were analyzed using statistical software.

'Continuous variables were presented as means and standard deviations, while categorical variables were expressed as frequencies and percentages'. 'Comparative analyses between the mastectomy and BCS groups were performed using the chi-square test for categorical variables and the independent t-test for continuous variables'. 'P-values <0.05 were considered statistically significant. Survival analyses were conducted using Kaplan-Meier estimates, and differences were assessed using the log-rank test'.

RESULT

The study included 110 patients, evenly distributed between the mastectomy and conservative surgery groups. The average age was comparable, 'with no statistically significant difference between the two groups (P=0.68)'. Socioeconomic status showed a balanced distribution, with the majority of patients in the medium socioeconomic category across both groups. Tumor size was significantly larger in the mastectomy group (mean 32.5 mm) compared to the conservative surgery group (mean 28.7 mm, P=0.03), suggesting tumor size may have influenced the surgical choice. Other tumor-related factors, such as histological type, hormone receptor positivity, Ki-67 index, and AJCC stage, showed no significant differences between the groups, indicating baseline comparability for these clinical variables.

Table 1: Demographic and Clinical Characteristics of Patients

Variable	**Mastectomy Group (n=55)**	**Conservative Surgery 'Group (n=55)'**	**P-value**
Age (mean ± SD)	51.4 ± 10.2	50.6 ± 9.8	0.68
Sex (Female %)	100%	100%	-
Socioeconomic Status (%)			
- Low	30.9%	29.1%	0.76
- Medium	45.5%	50.9%	0.58
- High	23.6%	20%	0.49
Tumor Size (mean ± SD, mm)	32.5 ± 8.6	28.7 ± 6.2	0.03
Histological Type (%)			
- Invasive Ductal	83.6%	81.8%	0.82
- Lobular	16.4%	18.2%	0.75
Hormone Receptor Positive (%)	78.2%	80%	0.71
Ki-67 Index (≥15%)	55%	52.7%	0.67
AJCC Stage (I/II/III, %)			
- Stage I	32.7%	38.2%	0.45
- Stage II	50.9%	47.3%	0.56
- Stage III	16.4%	14.5%	0.78

The treatment protocols varied significantly between the two groups, particularly in the use of radiotherapy. All patients in the conservative surgery group received adjuvant radiotherapy, compared to only 36.4% in the mastectomy group (P<0.001). This is consistent with standard practice where breast-conserving surgery requires radiation to reduce local recurrence risks. Chemotherapy, hormonal therapy, and targeted therapy usage were similar between the groups, with no significant differences observed. These findings suggest that treatment decisions beyond surgery were aligned across the groups, except for radiotherapy, which was integral to breast-conserving surgery.

Table 2: Treatment-Related Variables

Variable	Mastectomy Group (n=55)	Conservative Surgery Group (n=55)	P-value
Adjuvant Chemotherapy (%)	81.8%	85.5%	0.62
Adjuvant Radiotherapy (%)	36.4%	100%	<0.001
Hormonal Therapy (%)	76.4%	78.2%	0.78
Targeted Therapy (%)	20%	25.5%	0.49

The surgical outcomes between the mastectomy and conservative surgery groups were similar. 'Local recurrence was slightly higher in the conservative surgery group (7.3% vs. 5.5%), though this difference was not statistically significant (P=0.67)'.

Distant metastasis rates were comparable, and disease-free survival was slightly higher in the mastectomy group (78.2% vs. 76.4%, P=0.76). 'Overall survival and cancer-specific survival were excellent in both groups, with no significant differences'. These results suggest that both surgical approaches offer comparable oncological safety when appropriately selected.

Table 3: Surgical and Oncological Outcomes

Outcome	Mastectomy Group (n=55)	Conservative Surgery Group (n=55)	P-value
Local Recurrence (%)	5.5%	7.3%	0.67
Distant Metastasis (%)	16.4%	14.5%	0.78
Disease-Free Survival (DFS, %)	78.2%	76.4%	0.76
Overall Survival (OS, %)	85.5%	87.3%	0.68
Cancer-Specific Survival (CSS, %)	94.5%	96.4%	0.82

Post-surgical complications were generally low in both groups. 'The incidence of wound infections was slightly higher in the mastectomy group (7.3% vs. 3.6%, P=0.42), but this was not statistically significant'. Lymphedema was observed more frequently in the mastectomy group (12.7% vs. 5.5%, P=0.18), likely due to the more extensive axillary dissection commonly performed during mastectomy.

Chronic pain was reported by a higher percentage of mastectomy patients (14.5% vs. 9.1%, P=0.34). Patient satisfaction, while not statistically different, was slightly higher in the conservative surgery group, reflecting the potential cosmetic and psychosocial advantages of this approach.

Table 4: Post-Surgical Complications

Complication	'Mastectomy Group (n=55)'	'Conservative Surgery Group (n=55)'	'P-value'
Wound Infection (%)	7.3%	3.6%	0.42
Lymphedema (%)	12.7%	5.5%	0.18
Chronic Pain (%)	14.5%	9.1%	0.34
Patient Satisfaction (%)	78.2%	85.5%	0.41

Quality of life outcomes showed a slight advantage for the conservative surgery group. Functional quality of life, as measured by FACT-B scores, was significantly higher in the conservative surgery group (70.6 ± 7.9 vs. 65.2 ± 8.4, P=0.02). Psychological well-being, measured by anxiety levels, also appeared better in the conservative surgery group, though this difference was not statistically significant. These findings highlight the potential long-term benefits of breast-conserving surgery on patients' quality of life, which may play a critical role in patient decision-making.

Table 5: Quality of Life Outcomes

Outcome	Mastectomy Group (Mean ± SD)	Conservative Surgery Group (Mean ± SD)	P-value
Functional QoL (FACT-B score)	65.2 ± 8.4	70.6 ± 7.9	0.02
Psychological Impact (Anxiety %)	20.9%	14.5%	0.21

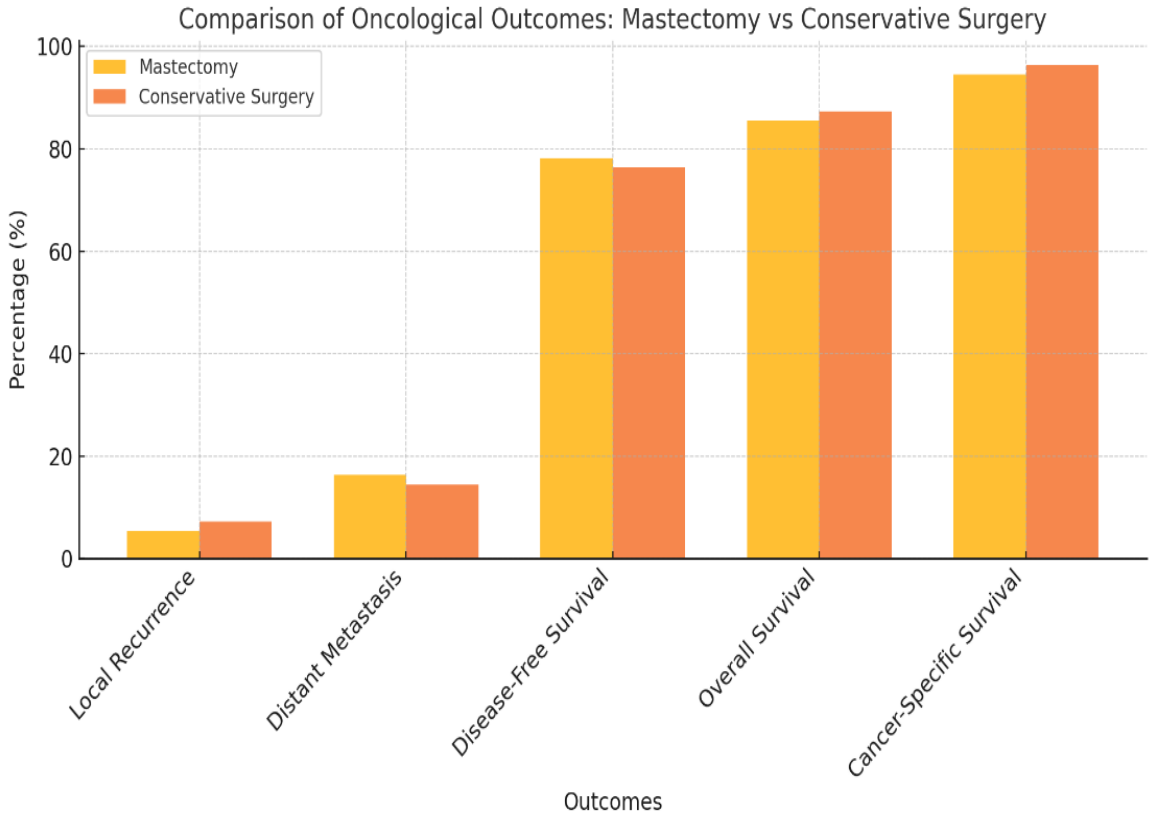

Figure 1: bar graph compares oncological outcomes between mastectomy and conservative surgery groups. Local recurrence (5.5% vs. 7.3%) and distant metastasis rates (16.4% vs. 14.5%) were similar. Survival outcomes, including disease-free, overall, and cancer-specific survival, showed negligible

differences, with slightly better results in the conservative surgery group. These findings affirm that both surgical approaches provide comparable outcomes, allowing for patient-centered treatment decisions based on preferences and clinical factors.

DISCUSSION

This study compared the outcomes of mastectomy and breast-conserving surgery (BCS) in patients with breast carcinoma treated at Gomal Medical College over a one-year period. The results demonstrate that both surgical approaches offer comparable oncological safety and survival outcomes, supporting their roles as effective treatment modalities when appropriately selected.

Our findings showed no significant differences in local recurrence, distant metastasis, disease-free survival, or overall survival between the two groups. 'These results align with landmark trials such as the National Surgical Adjuvant Breast and Bowel Project (NSABP) B-06 and the European Organization for Research and Treatment of Cancer (EORTC) 10801 trial, both of which concluded that BCS followed by radiotherapy provides equivalent survival rates to mastectomy in early-stage breast cancer' [7-9]. This reinforces the notion that BCS, when combined with adjuvant therapies, is not inferior to mastectomy in terms of long-term cancer control.

Complications were slightly higher in the mastectomy group, with higher rates of lymphedema, wound infections, and chronic pain, though these differences were not statistically significant. These findings are consistent with prior studies reporting that mastectomy, particularly with axillary lymph node dissection, increases the risk of these adverse effects[10-12]. In contrast, BCS patients generally reported higher satisfaction and better cosmetic outcomes, contributing to improved psychosocial well-being.

'Quality of life, as measured by the FACT-B scale, was significantly better in the BCS group'. This aligns with existing literature suggesting that preserving the breast contributes to improved body image, emotional well-being, and overall quality of life[13-16]. However, it is important to note that individual preferences and psychological factors play a critical role in patient satisfaction, and these should be considered during treatment planning.

A notable difference between the groups was the use of adjuvant radiotherapy, which was mandatory for BCS but not always required for mastectomy. This highlights the critical role of radiotherapy in reducing local recurrence rates after BCS. Studies have shown that omitting radiotherapy significantly increases the risk of recurrence, emphasizing its importance as part of breast-conserving treatment[17-19].

Strengths and Limitations

The strength of this study lies in its comprehensive comparison of outcomes, including survival, complications, and quality of life, within a local context. However, certain limitations should be acknowledged. 'The sample size was relatively small, and follow-up was limited to one year, which may not capture long-term outcomes such as late recurrences or survival differences'. Additionally, the study did not assess the impact of genetic or molecular tumor markers, which could further guide surgical decision-making.

The results of this study support the continued use of BCS as a viable alternative to mastectomy for early-stage breast cancer, provided that clear surgical margins and appropriate adjuvant therapies are achieved. These findings highlight the importance of a patient-centered approach, taking into account individual preferences, tumor characteristics, and access to adjuvant therapies. Shared decision-making, supported by evidence-based recommendations, is essential to optimize outcomes and patient satisfaction.

CONCLUSION

In conclusion, both mastectomy and breast-conserving surgery are effective treatment options for breast carcinoma, with comparable oncological and survival outcomes. While BCS offers advantages in quality of life and cosmetic outcomes, treatment decisions should be tailored to the patient's clinical profile and preferences. 'Further studies with longer follow-up periods are needed to validate these findings and explore additional factors influencing treatment outcomes'.

REFERENCES

1. Bartholomew, K., et al., Receipt of mastectomy and adjuvant radiotherapy following breast conserving surgery (BCS) in New Zealand women with BCS-eligible breast cancer, 2010–2015: an observational study focusing on ethnic differences. BMC cancer, 2023. **23**(1): p. 766.
2. Oei, S.L., et al., Evaluation of quality of life in breast cancer patients who underwent breast-conserving surgery or mastectomy using real-world data. Breast Cancer, 2023. **30**(6): p. 1008-1017.
3. Zhang, M., et al., Breast-conserving surgery is oncologically safe for well-selected, centrally located breast cancer. Annals of Surgical Oncology, 2021. **28**: p. 330-339.
4. Vohra, L.M., et al., Quality of life of breast cancer survivors: a comparison of breast conserving surgery versus total mastectomy with and without immediate reconstruction: a prospective cohort study. Annals of Medicine and Surgery, 2023. **85**(5): p. 1513-1517.
5. Ee, M.C.W., et al., Oncological outcomes following extreme oncoplastic breast conserving surgery (eOPBCS) for locally advanced breast cancer (LABC): A systematic review and meta-analysis. The Breast, 2024: p. 103869.
6. Liu, H. and C. Luo, Effect of breast-conserving surgery and modified radical mastectomy on quality of life of early breast cancer patients. Food Science and Technology, 2021. **42**: p. e47021.
7. Fancellu, A., et al., Outcomes after breast-conserving surgery or mastectomy in patients with triple-negative breast cancer: meta-analysis. British Journal of Surgery, 2021. **108**(7): p. 760-768.
8. Qin, R., et al., Survival Outcomes of Breast-Conserving Surgery Versus Mastectomy in Locally Advanced Breast Cancer Following Neoadjuvant Chemotherapy: A Meta-Analysis. Technology in Cancer Research & Treatment, 2024. **23**: p. 15330338241265030.
9. Simons, J.M., et al., Disease-free and overall survival after neoadjuvant chemotherapy in breast cancer: breast-conserving surgery compared to mastectomy in a large single-centre cohort study. Breast Cancer Research and Treatment, 2021. **185**: p. 441-451.
10. Gwark, S., et al., Survival after breast-conserving surgery compared with that after mastectomy in breast cancer patients receiving neoadjuvant chemotherapy. Annals of Surgical Oncology, 2023. **30**(5): p. 2845-2853.
11. Christiansen, P., et al., Breast-conserving surgery or mastectomy?: impact on survival. Annals of Surgery Open, 2022. **3**(4): p. e205.
12. Mohamedahmed, A.Y.Y., et al., Comparison of surgical and oncological outcomes between oncoplastic breast-conserving surgery versus conventional breast-conserving surgery for treatment of breast cancer: A systematic review and meta-analysis of 31 studies. Surgical oncology, 2022. **42**: p. 101779.
13. Kim, H., et al., Survival of breast-conserving surgery plus radiotherapy versus total mastectomy in early breast cancer. Annals of surgical oncology, 2021: p. 1-9.
14. Shubeck, S., et al., Comparison of outcomes between BRCA pathogenic variant carriers undergoing breast-conserving surgery versus mastectomy. Annals of surgical oncology, 2022. **29**(8): p. 4706-4713.
15. Dahlui, M., et al., Breast conserving surgery versus mastectomy: the effect of surgery on quality of life in breast cancer survivors in Malaysia. BMC Women's Health, 2023. **23**(1): p. 607.

16. Song, Y.-C., et al., Breast-conserving surgery versus mastectomy for treatment of breast cancer after neoadjuvant chemotherapy. Frontiers in Oncology, 2023. **13**: p. 1178230.
17. Li, S., et al., A meta-analysis of randomized controlled trials comparing breast-conserving surgery and mastectomy in terms of patient survival rate and quality of life in breast cancer. International Journal for Quality in Health Care, 2024. **36**(2): p. mzae043.
18. De la Cruz Ku, G., et al., Does breast-conserving surgery with radiotherapy have a better survival than mastectomy? A meta-analysis of more than 1,500,000 patients. Annals of Surgical Oncology, 2022. **29**(10): p. 6163-6188.
19. Abrahimi, M.S., et al., Associated factors and survival outcomes for breast conserving surgery versus mastectomy among New Zealand women with early-stage breast cancer. International journal of environmental research and public health, 2021. **18**(5): p. 2738.