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Impact of Modified Radical Mastectomy vs Breast-Conserving Surgery: Clinical Practice in Women with Breast Cancer 10 Years study at Tertiary Cancer Center in Nepal

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ABSTRACT

Among women in Nepal, breast cancer is the most prevalent type of cancer. Surgery plays a crucial and definitive role in the treatment of this form of cancer. Over the years, numerous research studies have been conducted, revealing that breast-conserving surgery (BCS) followed by radiotherapy offers disease-free survival (DFS) and overall survival (OS) rates comparable to those of mastectomy (MRM).

The primary responsibility for discussing treatment choices with the patient falls to the surgeon. This study was conducted retrospectively at the Breast Unit within the Department of Surgical Oncology at B.P. Koirala Memorial Cancer Hospital in Bharatpur, Nepal.

The study included patients diagnosed with stage I or II breast cancer, with tumor sizes smaller than 5 cm. Patients with advanced or metastatic breast cancer were not part of the study. This study included patients who received their breast cancer diagnoses between 2013 and 2023. A total of 2,382 female patients were enrolled in the study. Out of this cohort, 97.23% (n = 2,316) of the females chose mastectomy (MRM), while 2.77% (n = 66) opted for

breast-conserving surgery (BCS). The primary motivations cited by patients for choosing mastectomy (MRM) included concerns about cancer recurrence (3.88%, n = 90), a desire to avoid a greater portion of radiation therapy (2.6%, n = 60), and the financial strain associated with treatment (5.18%, n = 120).

The research indicates that the primary individuals influencing the choice of surgical treatment are the treating surgeon and the patient's spouse. Additionally, the active involvement of women in the counseling process is a significant factor.
Keywords: MRM, BCS, Early breast cancer, Patient participation, Counseling

BACKGROUND

Globally female breast cancer has surpassed lung cancer as the most commonly diagnosed cancer, with an estimated 2.3 million new cases (11.7%) and with an estimated (6.9%) death from breast cancer (1). In Nepal, Over the last ten years Breast Cancer has been rising steadily and now it is the most common cancer. Age adjusted rate is as high as 25.8 per 100,000 women and mortality 12.7 per 100,000 women. and surgery plays a crucial role in its treatment.

The surgical choices include modified radical mastectomy (MRM) and breast-conserving surgery (BCS). Numerous studies conducted over the years have demonstrated that BCS followed by radiotherapy provides comparable disease-free survival (DFS) and overall survival (OS) when compared to MRM (2). All of these findings impact the treatment decision when choosing a surgical procedure. After breast-conserving surgery (BCS), patients exhibit significantly improved social, emotional, and physical adjustment compared to those who undergo MRM. Additionally, the BCS group experiences better postoperative outcomes and a quicker return to normal function(3). BCS offers the benefit of fewer complications at the surgical site and more favorable cosmetic results when compared to MRM (4).

In the United States, approximately 60% of women with early-stage breast cancer choose breast-conserving surgery (BCS) (5). However, in Nepal, the adoption of BCS is limited, and only a small percentage of women with early-stage breast cancer opt for this procedure (6). The preference for MRM in Nepal may be attributed to factors such as limited awareness of the comparable outcomes of MRM and BCS, concerns about radiation therapy, fear of cancer recurrence, and a lack of patient involvement in the decision-making process (7).

After undergoing MRM, many women experience psychological trauma, depression, anxiety, and disruptions in their body image (8). The surgeon takes on the primary responsibility of presenting the treatment options to the patient. Ultimately, the patient, along with her family and husband, collaboratively decide and choose an option. In certain Western countries, legislation mandates that surgeons must provide information about treatment options to both the patient and a family member.

The process of planning surgical decisions in Nepal remains unclear, with a lack of available literature on this subject. The patient's perspective plays a crucial role in the decision-making process. We have investigated the factors influencing surgery selection at the government tertiary cancer center in Bharatpur, which serves a patient population predominantly characterized by low literacy levels and economic dependency

Materials and Methods

This retrospective study, approved by the Institutional Review Board, was conducted at B.P. Koirala Memorial Cancer Hospital in Nepal. The study encompassed a total of 2,382 patients and spanned from 2013 to 2022. B.P. Koirala Memorial Cancer Hospital offers comprehensive facilities for advanced cancer treatment, conducting approximately 300 breast cancer surgeries annually.

Objectives of the Study

To know the most preferred surgical option.
To find out the reasons behind selecting the type of surgical option.

Inclusion Criteria
Patients with stage I or II breast cancer with tumor size less than 5 cm.

Exclusion Criteria
Locally advanced and metastatic breast cancer, male breast cancer patient.

Study Population
Patients who underwent breast cancer surgery at the Department of Surgical Oncology - Breast Unit within B.P. Koirala Memorial Cancer Hospital from 2013 to 2022.

Data Collection
Demographic information about patients, such as age, marital status, education, income, obstetric history, menstrual history, past medical history, personal history, and clinical findings, was gathered from patient case files and a specific study proforma for each registered patient. In addition, patients were provided with a custom questionnaire designed to evaluate multiple factors influencing their surgical decision. These factors were broadly categorized into those related to the patient, the tumor, and the interaction between the surgeon and the patient. Tumor-related factors included the stage of the disease, tumor size, and the affected quadrant. Specialized cancer surgeons, trained in breast cancer surgery, conducted counseling sessions regarding the available surgical options, outlining their respective advantages and disadvantages. Each case was then reviewed in our Institutional Multidisciplinary Tumor Board, followed by further counseling.

Counseling sessions were held in the Outpatient Department (OPD) of the hospital, and the breast oncosurgery team continued to follow patients in the ward after their admission until the final surgical plan was determined. After collecting all self-designed questionnaires, data was analyzed. Prior to enrollment in the study, each participant provided consent and received a patient information sheet detailing the breast cancer situation in Nepal, the study's purpose, and the confidentiality of their personal information. All patients underwent evaluation, including FNAC (fine needle aspiration cytology) or Trucut biopsy for lesions, ultrasound of bilateral breasts for those under the age of 40, and bilateral mammograms for those over 40. Additionally, they received a CECT (Contrast-Enhanced Computed Tomography) of the chest, abdomen, and pelvis.

Statistical Methods and Analyses
The study data was organized and tabulated within an Excel spreadsheet. Analysis was conducted using the Statistical Package for Social Sciences. The data pertaining to the preferred type of surgery was presented in both absolute numbers and as a percentage of the total.

Results
In the study, a total of 2,382 female participants were enrolled, with 97.23% (n = 2,316) choosing MRM and 2.77% (n = 66) opting for BCS. Of these, only 86 females were unmarried, while the remaining 2,296 were married. There was an age group difference, with 44.33% (n = 1,056) of females below 40 years and 55.66% (n = 1,326) aged above 40. Among the 86 unmarried females, 18% (n = 429) had comorbidities such as hypertension (HTN), diabetes mellitus (DM), both (HTN + DM), and asthma.

Regarding education, 50.38% had no formal education, 33.58% had completed middle school, and 16% had achieved high school education. In terms of economic status, the study population was divided into non-earning dependents (83.37%, n = 1,986), earning dependents (9.9%, n = 236), and self-supporting (6.7%, n = 160). Family history of breast cancer was found in 3.2% (n = 76) of patients.

The most common reason for choosing MRM was the fear of cancer recurrence (3.88%, n = 90), followed by avoiding the side effects of increased radiation therapy (2.6%, n = 60). For those opting for BCS, the most common reason was the concern of losing a breast (69.69%, n = 46).

Surgical decisions for MRM or BCS were primarily made by the patients' husbands (97.64%, n = 2,326), with a small percentage of patients deciding together with their husbands (2.35%, n = 56)."

Discussion

Patients with early-stage breast cancer underwent a thorough assessment. Following a comprehensive evaluation, each case was reviewed in our institutional multidisciplinary tumor board to determine the treatment plan, followed by counseling regarding the available surgical options. Tissue diagnosis was obtained through FNAC or Trucut Biopsy. Hormonal receptor status was determined from the trucut biopsy and final histopathology specimen to plan adjuvant treatment.

Numerous studies have highlighted age as a significant factor influencing the choice between MRM and BCS (9). In the case of elderly patients, cosmetic considerations often take a backseat, with their primary concern being the impact of radiation therapy on their overall well-being. This shift in preference is a result of their greater inclination towards MRM instead of BCS. Teh et al.(10) reported that in Asia, patients aged over 60 years were more inclined to choose mastectomy over breast conservation. However, the current study reveals that there is no age-based difference in both groups of patients.

Hershman et al.(11) utilized data from the U.S. 2000 census to create an overall socioeconomic status (SES) score for each zip code, considering income, poverty, and education data. Their findings indicated that patients who opted for mastectomy typically had a lower SES.". Patients lacking health insurance are often responsible for covering the costs of their surgery. The BCS procedure followed by postoperative radiotherapy can be expensive. Several factors contribute to the shift in decision-making from MRM to BCS, including concerns about complications related to radiation therapy and the additional time commitment it requires.

It can be challenging for patients with lower educational levels to embrace information based on recent research. Some patients continue to hold the belief that mastectomy is the sole dependable option for breast cancer surgery, assuming that a more extensive operation would result in more effective treatment (12). In a study conducted by Jeffrey Gu et al.(13), they examined these decision-making factors by analyzing data from seven research articles. Their findings indicated that individuals with higher socioeconomic status tend to have higher rates of breast conservation surgery, while rural areas located farther from radiation treatment facilities are associated with lower rates of BCS.

In a study conducted by Jeffrey Gu et al., they examined these decision-making factors by analyzing data from seven research articles. Their findings indicated that individuals with higher socioeconomic status tend to have higher rates of breast conservation surgery, while rural areas located farther from radiation treatment facilities are associated with lower rates of BCS (14).

The current study observed a lower rate of active participation among females due to factors such as lower education, limited economic resources, and rural upbringing. Most females with middle school education or no formal education chose MRM, while independent females with higher education preferred BCS. This highlights the influential role of education in the decision-making process. The lower educational attainment is largely attributed to their rural background, which often results in a non-earning-dependent economic status. These combined factors contribute to reduced self-confidence, ultimately leading to limited engagement or interaction with the surgeon during counseling. This, in turn, results in a diminished understanding of the advantages and disadvantages of BCS or MRM.

During counseling at the Outpatient Department (OPD), the surgeon's responsibility was to provide a comprehensive explanation of the equality in terms of Disease-Free Survival (DFS) and Overall Survival (OS) between MRM and BCS, based on the best available literature (15). Corradini et al.(16) conducted a study involving one of the largest cohorts, consisting of 7,565 patients with early-stage breast cancer in real-life clinical

practice. Their findings indicated that BCS followed by radiation therapy (RT) led to enhanced outcomes in real-world clinical practice, particularly in terms of local control, distant control, and overall survival when compared to mastectomy alone. BCS preserves body image and cosmesis, a concept that finds support in the existing literature (17).

In this study, patients granted surgeons the authority to select the surgical procedure, primarily due to a lack of confidence in their own decision-making abilities. The surgeons provided the best possible option based on the patients' economic status. Our hospital does not offer free surgery, and patients are responsible for covering the cost, which is the same for BCS and MRM. MRM is less expensive, and the postoperative hospital stay is shorter if the recovery is uneventful. Patients with lower education levels, non-earning-dependent status, rural backgrounds, and the absence of health insurance policies often rely on the surgeon to make the sole decision.

The shift from MRM to BCS was often due to concerns about losing a breast, a reason shared by other females who initially chose BCS. Therefore, the study suggests that females with higher qualifications, self-supporting economic status, knowledge of breast self-examination (BSE), and urban backgrounds tend to prefer breast conservation surgery.

The primary reason for opting for mastectomy was the fear of cancer recurrence (3.88%, n = 90). Following this, the next most common reason was to avoid the extended fraction of radiation therapy (2.6%, n = 60). Ohsumi et al. (18) conducted a study examining the impact of non-medical factors on the selection of surgical options among Chinese patients eligible for breast-conserving surgery. Their findings indicated that patients who were younger, had higher income and education levels, experienced shorter intervals between admission and surgery, and had a more expedited diagnosis-to-surgery time frame were more inclined to opt for breast-conserving surgery over mastectomy.

In our study, we observed that females with lower educational attainment, an economic status dependent on others, and rural backgrounds tended to favor mastectomy (MRM). Past research has also noted that patients often feel more secure following mastectomy, with the fear of cancer recurrence serving as a significant motivator for choosing mastectomy over breast-conserving surgery (BCS) (12). The long-term fear of cancer recurrence continues to be a significant challenge (19). In the current study, surgical choices are primarily made by the surgeon in combination with the husband or jointly by the patient and her husband.

Patients with a positive family history of breast cancer often chose mastectomy (MRM) due to concerns about cancer recurrence, likely influenced by past experiences of recurrence within their families. In rural areas, where educational levels are lower and many women have a non-earning-dependent status, this underscores the challenges in Nepal, which is considered a male-dominated country, where women's health concerns may receive less attention, particularly in rural settings.

This situation leads to a lower level of confidence among these women and difficulties in expressing their feelings, ultimately resulting in limited participation during decision-making counseling. Notably, the self-designed questionnaire included a question about understanding the procedure after counseling. Surprisingly, all patients who opted for MRM responded positively to this question, indicating potential misconceptions or poor understanding of cancer biology, possibly influencing their choice of MRM

Limitations

The study was conducted at a tertiary cancer center providing comprehensive breast cancer treatment facilities. Nevertheless, the choice of surgery is influenced by patient affordability, dividing them into two groups: those who can afford the treatment and those who cannot. In Nepal, there is a clear need for prospective multicenter studies to ensure consistency in the counseling process across all centers.

This study has limitations concerning non-affordable patients. Despite their strong desire for BCS, they often end up choosing MRM due to financial constraints. The counseling process, despite the involvement of experienced surgeons, may require improvement in the future, possibly through the inclusion of video demonstrations of both procedures to minimize surgeon-related bias. Efforts are already underway in this regard. Additionally, the follow-up data and post-surgery experiences of all patients were not analyzed until the completion of the entire treatment. These limitations are acknowledged, and there are plans to address them in the future through a prospective database.

Conclusion

The study highlights that the key decision-makers in selecting surgical options are the treating surgeon and the patient's husband. Active participation of women during the counseling process plays a critically important role in the decision-making process. The most prevalent reason leading women to opt for MRM instead of BCS is the fear of cancer recurrence.

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