Original Research

Compare the rate of breast conserving surgery Vs mastectomy in breast cancer patients: Teaching hospital based study at Madhya Pradesh.

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Abstract

Background: Breast cancer (BC) is the most common malignancy and one of the leading causes of cancer death among women worldwide (Mavaddat et al., 2019). The incidence of breast cancer has been rising steadily and for the first time in 2012, breast cancer was the most common cancer in women in India. Breast cancer seems to be more common in the younger age group as a significant number of patients are below 30 years.

Aim To compare rate of breast-conserving surgery vs mastectomy in breast cancer patients

Method and materials: Eighty- Six breast cancer patients were clinically staged using the American Joint Committee on Cancer (AJCC) TNM staging. All patients were offered BCS. For large operable breast cancer (LOBC) and locally advanced breast cancer (LABC), neoadjuvant chemotherapy (NACT) followed by BCS was offered to these patients who wish to conserve their breast.

Results and Observations: Right side was involved in 52% and left in 48%. There were 64% pre-/perimenopausal and 36% postmenopausal patients. Upper outer quadrant was involved in 55% and upper inner in 45%. Early breast cancer (EBC) was involved in 72%, large operable breast cancer (LOBC) in 15% and locally advanced breast cancer (LABC) in 13%. The difference was significant ($P< 0.05$). Mastectomy was performed in 30 and breast conserving surgery on 56. Lumpectomy in 26, quadrantectomy in 10, revision of positive or unknown margins post-lumpectomy in 12 and wire-guided wide local excision of non-palpable lump in 8 cases. The difference was significant ($P< 0.05$). Common subtype ER+/PR+/HER2- in T1 was seen in 7, in T2 in 18, in T3 in 22 and in T4 in 18. ER+/PR+/HER2+ in T1 was seen in 2, T2 in 4, ER-/PR-/HER2+ was seen in 3 in T1 and 2 in T2 and triple negative 2 in T1 and 10 in T2. Mastectomy was performed in 61% ER+/PR+/HER2-, 47% ER+/PR+/HER2+, 78% ER-/PR-/HER2+ and 56% triple negative subtypes and BCS in 39% ER+/PR+/HER2-, 53% ER+/PR+/HER2+, 22% ER-/PR-/HER2+ and 44% triple negative subtypes. The difference was significant ($P< 0.05$)

Conclusion: The incidence rates of breast cancer and death are rising in many Asian countries that threatens the health of Asian population. Increased age, early menarche, delayed first menstruation, peri menopausal women and family history positive are common major risk factors associated with breast cancer in India and Asia. Majority of the women presented with early breast cancer which makes them suitable for breast conserving surgery.

Keywords: Breast conserving surgery (BCS), Breast cancer, mastectomy, Lumpectomy, Quadrantectomy, Total Mastectomy(TM),

INTRODUCTION:

Breast cancer (BC) is the most common malignancy and one of the leading causes of cancer death among women worldwide (Mavaddat et al., 2019) **[1]**. Potential risk factors for BC include high body mass index, older age, family history, long menstrual periods, use of oral contraceptives, and exposure to radiation (Lee et al., 2019). **[2]** The vast majority of breast tumors are originated from glandular epithelial cells. Furthermore, invasive ductal carcinoma is the most common type of BC (approximately 70%), followed by lobular, medullary, mucinous, comedo, papillary, tubular, and inflammatory carcinomas, seen in many researches. The incidence of breast cancer has been rising steadily and for the first time in 2012, breast cancer was the most common cancer in women in India. Breast cancer seems to be more common in the younger age group as a significant number of patients are below 30 years.**[3]** Over the past 2 decades, the management of localized breast cancer has changed substantially. The increased use of screening mammography has permitted earlier detection of breast cancer and an increase in the number of node-negative and in situ cancers observed.**[4]** The validation of a variety of new prognostic indicators including estrogen and progesterone receptors, biochemical markers, flow cytometry markers and oncogene markers has increased our ability to identify groups of patients at high risk for distant recurrence.**[5]** Breast conservation surgery (BCS) is the complete removal of the breast cancer with a margin of normal tissue surrounding the tumour. This is usually followed by radiation therapy (RT). In terms of loco-regional recurrences rates and overall survival rates, BCS is comparable to total mastectomy (TM).**[6]** Most reports indicate that the majority of women who present with breast cancer do not have contraindications to conservative surgery. Reasons for underutilisation of breast conservation include patient preference, age and poor prognostic factors. Medical comorbidity is rarely a major factor in the underutilisation of breast-conserving surgery.**[7]** The present study was performed with the objective to compare rate of breast-conserving surgery vs mastectomy in breast cancer patients at our centre.

MATERIALS AND METHODS:

After considering the utility of the study and obtaining approval from ethical review committee of the institute, we selected eighty- four breast cancer patients. A thorough clinical examination, preoperative bilateral mammogram and core biopsy of the breast lump was performed. All cases were clinically staged using the American Joint Committee on Cancer (AJCC) TNM staging. All patients were offered BCS. For large operable breast cancer (LOBC) and locally advanced breast cancer (LABC), neoadjuvant chemotherapy (NACT) followed by BCS was offered to these patients who wish to conserve their breast. Breast-conserving surgery included wide local excision quadrantectomy, wire-guided localisation and excision of non-palpable lumps and revision of margins of previous lumpectomy. Patients were classified as ER+/PR+/HER2−, ER+/PR+/ HER2+, ER-/PR-/HER2+ and triple negative based on the immunohistochemistry (IHC) analysis on core biopsy specimen preoperatively. The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

Methods:

Breast-conserving surgery:

As to incision design, BCS was performed with two separate incisions for the breast and axilla. For patients with a lesion in the axillary tail of Spence, the most appropriate incision should be selected according to its specific location. Patients with a lesion in the upper hemisphere of the breast underwent an arcuate incision that was parallel to the areola, while patients with a lesion in the lower hemisphere of the breast were offered a radial incision through the center of the nipple. The axillary incision should be parallel along the axillary fold and the incision length of generally about 6cm was modulated to make it more convenient for axillary LND. As to lesion resection, the extended local resection or quadrantectomy was selected to remove the complete lesion, according to the actual situation. A 1-2cm margin of normal tissue was removed with the lesion as well as the puncture tract. If the lesion invaded Cooper's ligament or skin, shown as invasion phenomena such as depression, it was necessary to completely remove the epidermis, otherwise the epidermis could be preserved appropriately. As to pathological examination, peripheral margins of the resected specimens were marked and sent for frozen section examination. Patients with positive surgical margins underwent extended resection and an additional resection margin of 5cm was recommended. Then pathological examination was performed again. If the results remained positive after extended resection, BCS would be replaced by MRM. As to LND, the dissection involved lymph nodes from the leading edge of the latissimus dorsi to the deep surface of the pectoralis minor, as well as those below the axillary vein. A drain was placed in both the axilla and the incision, and the operation was completed via routine layer-by-layer suture.

Mastectomy:

A fusiform incision was made around the lesion and carried to the superficial fascia, followed by free flap dissection and breast resection. A subcutaneous flap lying from the lower edge of the clavicle to the upper edge of the rectus abdominis, and from the lateral edge of the sternum to the leading edge of the latissimus dorsi was dissected. Subsequently, pectoralis major and pectoralis minor muscles were identified carefully, and the excision of flap with a breadth of 3cm around the perimeter of the lesion was conducted. A drainage tube was indwelled after ipsilateral axillary lymph node dissection, and the operation was completed via routine layer-by-layer suture.

RESULTS AND OBSERVATIONS:

Right side was involved in 52% and left in 48%. There were 64% pre-/perimenopausal and 36% postmenopausal patients. Upper outer quadrant was involved in 55% and upper inner in 45%. Early breast cancer (EBC) was involved in 72%, large operable breast cancer (LOBC) in 15% and locally advanced breast cancer (LABC) in 13%. The difference was significant ($P < 0.05$) [Table 1]. Mastectomy was performed in 30 and breast conserving surgery on 54. Lumpectomy in 24, quadrantectomy in 10, revision of positive or unknown margins post-lumpectomy in 12 and wire-guided wide local excision of non-palpable lump in 8 cases. The difference was significant ($P < 0.05$) [Table 2].

Table 1: Parameters review.

Parameters	Variables	Numbers	P value
Side	Right	52%	0.81
	Left	48%	
Menopausal	pre-/perimenopausal	64%	0.02
	Post-menopausal	36%	
Quadrant	Upper outer	55%	0.93
	Upper inner	45%	
Type	EBC	72%	0.05
	LOBC	15%	

	LABC	13%	

Table 2: Type of surgery suggested to the patients.

Parameters	Variables	Numbers	P value
Mastectomy	-	30	0.05
BCS	Lumpectomy	26	-
	Quadrantectomy	10	-
	Revision of positive or unknown margins post-lumpectomy	12	-
	Wire-guided wide local excision of non-palpable lump	8	-

Table 3: Molecular subtypes of various T stages patients who undergone to BCS.

Molecular subtype	T1(12)	T2(34)	T3(22)	T4(18)
ER+/PR+/HER	7	18	22	18
ER+/PR+/HER2+	2	4	0	0
ER-/PR-/HER2+	3	2	0	0
Triple negative	2	10	0	0

Common subtype ER+/PR+/HER2- in T1 was seen in 7, in T2 in 18, in T3 in 22 and in T4 in 18. ER+/PR+/HER2+ in T1 was seen in 2, T2 in 4, ER- /PR-/HER2+ was seen in 3 in T1 and 2 in T2 and triple negative 2 in T1 and 10 in T2 [Table 3].

Table 4: BCS vs mastectomy rates across molecular subtype.

Molecular subtype	Mastectomy	BCS	P value
ER+/PR+/HER	61%	39%	0.01
ER+/PR+/HER2+	47%	53%	0.12
ER-/PR-/HER2+	78%	22%	0.01
Triple negative	56%	44%	0.17

Mastectomy was performed in 61% ER+/PR+/HER2-, 47% ER+/PR+/HER2+, 78% ER- /PR-/HER2+ and 56% triple negative subtypes and BCS in 39% ER+/PR+/HER2-, 53% ER+/PR+/HER2+, 22% ER-/PR-/HER2+ and 44% triple negative subtypes. The difference was significant ($P< 0.05$) [Table 4].

DISCUSSION:

Breast cancer rates and mortality are both high in many Asian nations, and they fluctuate over time. Similarly, high frequency is observed in Sub-Saharan Africa, which is due to a lack of awareness and late-stage detection, as well as gender norms and spirituality **[8],** almost the same reasons that are present in Asian countries. Systemic adjuvant therapy with cytotoxic agents, the anti-estrogen tamoxifen, or a combination of both has improved the survival for subsets of nodepositive and node-negative patients.**[9]** Additionally, during this 20-year period, the concept that mastectomy was the sole effective local treatment for all types of breast cancer has also come into question with the increased use of breast-conserving techniques involving local excision followed by radiation therapy**.[10]** The most common cancer in women is breast cancer with an estimated 1.67 million new cancer cases diagnosed worldwide in 2012**.[11]** In India, there is a significant increase in the incidence and cancer-associated morbidity and mortality in Indian subcontinent as described in many Indian studies. When compared to the west, Indian women diagnosed with breast cancer were a decade younger, many being premenopausal**.[12,13]** The present study was performed with the objective to compare rate of breast-conserving surgery vs mastectomy in breast cancer patients. Our results showed that right side was involved in 52% and left in 48%. There were 64% pre-/perimenopausal and 36% post-menopausal patients. Upper outer quadrant was involved in 55% and upper inner in 45%. Early breast cancer (EBC) was involved in 72%, large operable breast cancer (LOBC) in 15% and locally advanced breast cancer (LABC) in 13%. We observed that

mastectomy was performed in 30 and breast conserving surgery on 54. Lumpectomy in 24, quadrantectomy in 10, revision of positive or unknown margins post-lumpectomy in 12 and wireguided wide local excision of non-palpable lump in 8 cases. Ali et al, **[14]** performed study of 401 patients who underwent breast cancer surgery. All early breast cancers (EBC) were offered BCS. For large operable breast cancer (LOBC) and locally advanced breast cancer (LABC), neoadjuvant chemotherapy (NACT) followed by BCS was offered to these patients who wish to conserve their breast. The mean age was 45 years. A total of 163 patients underwent BCS. Yearly, BCS rates were 38.8% in 2015, 36.7% in 2016 and 46.5% in 2017. Majority had EBC 310 (77.3%) of which 62.7% of T1 lesions (n = 51) had BCS, and 45.7% of T2 lesions (n = 258) had BCS of which 5 patients had to undergo NACT to preserve their breast whereas 100% Tis patient (n = 1) had mastectomy. Fifty patients had LOBC and only 2 (4%) patients had upfront BCS whereas 9 of them had to undergo NACT (18%). cT4 lesions had NACT followed by BCS in 2 patients. The rates of BCS have been increasing in India over the past few years. The majority of the women presented with EBC which makes them suitable for BCS. We found that common subtype ER+/PR+/HER2- in T1 was seen in 7, in T2 in 18, in T3 in 20 and in T4 in 18. ER+/PR+/HER2+ in T1 was seen in 2, T2 in 4, ER-/PR-/HER2+ was seen in 3 in T1 and 2 in T2 and triple negative 2 in T1 and 10 in T2. We found that mastectomy was performed in 61% ER+/PR+/HER2-, 47% ER+/PR+/HER2+, 78% ER- /PR-/HER2+ and 56% triple negative subtypes and BCS in 39% ER+/PR+/HER2-, 53% ER+/PR+/HER2+, 22% ER-/PR-/HER2+ and 44% triple negative subtypes. Lichter et al, **[15]** in their study mastectomy versus excisional biopsy (lumpectomy) plus radiation for the treatment of stage I and II breast cancer was compared. The minimum time on the study was 18 months and the median time on the study was 68 months. No differences in overall survival or disease-free survival were observed. Actuarial estimates at 5 years showed that 85% of mastectomy-treated patients were alive compared with 89% of the lumpectomy/radiation patients. The probability of failure in the irradiated breast was 12% by 5 years and 20% by 8 years according to actuarial estimates. Of 15 local breast failures, 14 were treated with and 12 were controlled by mastectomy; the ultimate local-regional control was similar in both arms of the trial.

CONCLUSIONS:

The incidence rates of breast cancer and death are rising in many Asian countries that threatens the health of Asian population. Increased age, early menarche, delayed first menstruation, peri menopausal women and family history positive are common major risk factors associated with breast cancer in India and Asia. Majority of the women presented with early breast cancer which makes them suitable for breast conserving surgery.

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