



3 YEARS LOCAL RECURRENCE AND DISTANT METASTASIS RATES AFTER HYPOFRACTIONATED AND CONVENTIONAL RADIOTHERAPY IN POST MASTECTOMY BREAST CANCER PATIENTS

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ABSTRACT

Introduction: Carcinoma of the breast is the commonest cancer in urban Indian women. Radiotherapy is commonly given after mastectomy in breast cancer patients and it targets post surgery tumor site.

Radiotherapy has shown to improve local control and overall survival.

Objectives: To compare local recurrence and distant metastasis rates after hypofractionated and conventional radiotherapy in post mastectomy breast cancer patients after 3 years follow up.

Material and Methods: Study was prospective and patients were divided into 2 groups. Group A patients were given hypofractionated radiotherapy -40 Gy/17 fractions/3.2 weeks@2.35 Gy/fraction while Group B patients were given conventional radiotherapy -50 Gy/25 fractions/5 weeks @2 Gy/fraction. They were followed for 3 years after giving radiotherapy.

Results: Out of 40 patients of group A, 5 patients showed local recurrence(12.5%) while 5 patients showed distant metastasis(12.5%). On the other hand, out of 40 patients of group B, 6 patients showed local recurrence(15%) while 3 patients showed distant metastasis(7.5%).

Conclusion: Overall 77.5% patients of group B showed no evidence of disease while 75% patients of group A found to be disease free. Thus, we concluded that both the fractionation radiotherapy schedules showed no significant difference statistically ($p>0.05$) in local recurrence and distant metastasis rates. Thus, both radiotherapy regimens can be used in treatment of breast cancer patients after mastectomy.

KEYWORDS : Hypofractionated, conventional, breast cancer, radiotherapy

INTRODUCTION:

Breast carcinoma is the second most common type of cancer after lung cancer worldwide(10.4% of all cancer incidence, both sexes counted) and the fifth most common cause of deaths due to cancer.[1] Breast cancer is the most common malignant neoplasm and a leading cause of death in women worldwide.[2] Breast cancer accounts for 1.8 million new cases and approximately 0.5 million deaths annually worldwide.[3]

The rise in incidence of 0.5–2% per annum has been seen across all regions of India and in all age groups but more so in the younger age groups (< 45 years). According to recent reports, India has 17 percent of the world's population suffering from breast cancer. More recent data from Globocan8 showed that for India for the year 2012; 144,937 women were newly detected with breast cancer and out of those 70,218 women died of breast cancer. So roughly for every 2 women newly diagnosed with breast cancer, one patient is dying compared to US where 1 patient dies out of every 5-6 newly diagnosed patients with breast cancer.[4]

The low survival rates in less developed countries can be explained mainly by the lack of early detection programmes, resulting in a high proportion of women presenting with late-stage disease, as well as by the lack of adequate diagnosis and treatment facilities.[5]

Management of breast cancer is undertaken by a multidisciplinary team based on national and international guidelines. Radiation therapy for breast cancer is usually performed after surgery. Radiotherapy has shown to improve local control and overall survival, with a 70% proportional reduction of the risk of recurrence[6] and a 9%–12% proportional reduction of the risk of death.[7,8,9]

In this study, we have compared local recurrence and distant metastasis rates after giving hypofractionated and conventional radiotherapy in breast cancer patients after a follow up of 3 years.

Objectives:

To compare local recurrence and distant metastasis rates after hypofractionated and conventional radiotherapy in post mastectomy breast cancer patients after 3 years follow up.

MATERIAL AND METHODS:

It was a prospective study done on 80 breast cancer patients who received postoperative radiotherapy at GCH, N.S.C.B. Medical College, Jabalpur. Radiotherapy was given 3-4 weeks after surgery and completion of chemotherapy course(neoadjuvant or adjuvant).

Patients were followed up for a period of 3 years(36 months) after completion of radiotherapy.

Technique: Patients were divided randomly into two groups- Group A and Group B

Group A- These patients were given Accelerated Hypofractionated Schedule (Regimen-1) - 40 Gy/17 fractions/3.2 weeks @ 2.35 Gy/fraction. Group B- These patients were given Conventional Fractionation Schedule (Regimen-2) - 50 Gy/25 fractions/5 weeks @ 2 Gy/fraction. Radiotherapy was given by Theratron 780-E (Co60) with 80 cm SSD.

Inclusion criteria:

- Histopathologically proven carcinoma breast.
- Age of patient ranging from 18 to 65 yrs.
- Patients who gave informed consent.

Exclusion criteria:

Patients not giving written informed consent.

Follow up was done every 2 monthly for first 2 years and then every 3 monthly for 3rd year after giving radiotherapy. In every follow up, clinical examination, mammography, USG abdomen & pelvis, chest X ray and routine blood investigations were done. For any suspected local recurrence found during examination, further confirmation was done by

FNAC/biopsy. On the basis of symptoms of patients, further investigations were done to rule out distant metastasis. For example, if patient showed neurological features like convulsions, CT scan of brain was done. Similarly in case of severe bone pain, bone scan was done to rule out bone metastasis.

RESULTS:

Total 80 patients were included in the study. Both groups had 40 patients each. In both the groups, majority of the patients were in their 4th decade of life. Both groups had more urban population. Both groups had more no. of patients with stage III disease i.e. 57.5% in group A and 62% in group B. Most common histological type was infiltrating ductal carcinoma (97.5%).

In group A, local recurrence was seen in 5 patients (12.5%) out of which 3 patients showed chest wall recurrence and 2 patients showed nodal recurrence and in group B, recurrence was seen in 6 patients (15%) out of which 3 patients showed chest wall recurrence and 3 patients showed nodal recurrence. Distant metastasis was found in 12.5% in group A and 7.5% in group B. Out of 5 patients of group A who showed distant metastasis, most common site of metastasis was lungs (3 patients) while second most common site was brain (2 patients). Overall, 75% patients of group A and 77.5% patients of group B showed no evidence of disease. (Table 1)

Table 1- Post mastectomy radiation therapy: Status on last visit

STATUS AT LAST FOLLOW UP	GROUP A N (%)	GROUP B N (%)
No evidence of disease	30 (75)	31 (77.5)
Recurrence of disease	5 (12.5)	6 (15)
Distant metastasis	5 (12.5)	3 (7.5)
Total no. of patients	40	40

Statistically no significant difference ($p > 0.05$) was observed in local recurrence ($p = 0.7$) and distant metastasis rates ($p = 0.5$) in both types of radiotherapy schedules.

DISCUSSION:

Surgery and radiotherapy are important for locoregional control in carcinoma breast. [10,11] Surgical treatment is mandatory for cure of breast carcinoma. [12] Modified radical mastectomy includes removal of breast with axillary nodal dissection but with preservation of pectoralis major muscle. [12] Radiation after surgery decreases loco-regional recurrence. [13] There are several reasons or end points that might justify the use of postmastectomy radiotherapy (PMRT) for patients with invasive breast cancer.

After modified radical mastectomy external radiotherapy is delivered to chest flap and drainage areas which include ipsilateral supraclavicular fossa, axilla and internal mammary nodes. External radiotherapy is delivered by tangent pair technique which spares lungs. [14]

There is no general agreement in literature regarding dose of radiation therapy which should be delivered to a patient after mastectomy. The doses, ranging from 32.5 Gy/3 weeks to 60 Gy/10 to 14 weeks have been given. [15-19]

In our study, we have given radiotherapy by two types of fractionation schedules and after completion of the treatment, patients were kept on follow up period of 36 months. During the follow up period, local recurrence was seen in 5 out of 40 patients in group A. In group B, 6 out of 40 patients showed local recurrence.

Metastasis to distant sites like brain, lungs and bone was seen in few patients. In group A, 5 out of 40 patients (12.5%) and in group B, 3 out of 40 patients (7.5%) showed distant metastasis.

Lung was noted to be the commonest site for the metastasis. Both the groups showed no significant difference in locoregional control (p value = 0.7) and distant metastasis (p value = 0.5).

Kumbhaj PR et al [14] did a study of post mastectomy chest wall irradiation in carcinoma breast patients. Their study showed chest wall recurrence, axillary failure and distant metastasis as 5/50 (10%), 3/50 (6%) and 16/50 (32%) in group A versus 3/54 (5.6%), 4/54 (7%) and 15/54 (28%) in Group B.

Meta-analyses and Randomized Controlled Trials (at least 18RCTs) of loco regional PMRT have consistently demonstrated that PMRT reduces the risk of loco regional failure by approximately two-thirds. [20,21,22] In our study, the loco regional control rate was 87.5% for group A patients whereas it was 85% for group B patients. Likewise the distant metastatic rate was 12.5% (5/40) in Group A and 7.5% (3/40) in Group B. This is comparable to the study done by AlamMdS [2] et al where the loco regional control rate was 84% for regimen 1 group whereas it was 86% for regimen 2 group. Likewise the distant metastatic rate was 20% (10/50) in regimen 1 and 16% (8/50) in regimen 2.

CONCLUSION:

From the present study we concluded that radiotherapy has major advantage in terms of high loco regional and distant control rate leading to improvement in disease free and overall survival. So, both type of radiotherapy fractionation can be given in breast cancer patients. Only advantage with hypofractionated radiotherapy is the shorter overall treatment time which is good in terms of time, cost, comfort and acceptability by the patients and it also reduces the heavy workload of already overburdened radiotherapy setup in a developing country like ours with scarcity of resources.

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