

## Breast Conservation Therapy Versus Mastectomy - Preliminary Results of Pattern of Failure and Survival Rate in Early Breast Cancer

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**Purpose:** This retrospective study was conducted to compare early preliminary results of breast conservation therapy (BCT) with mastectomy in early breast cancer.

**Materials and Methods:** We evaluated 171 women with AJCC stage I and II breast cancer who had been treated at Kangnam St. Mary's Hospital from March 1989 to August 1996. Eighty-eight patients underwent mastectomy and 85 patients did conservative surgery with breast irradiation. In the BCT group, all patients received whole breast irradiation to a total dose of 45~50 Gy/5~6 wks, followed by a boost to the original tumor site at least 60 Gy. Chemotherapy was administered to 29 (34.1%) patients in BCT and 40 (45.5%) in mastectomy, with various sequencing of surgery and/or radiation. We compared survival rate, patterns of failure in each treatment group and the prognostic factors that had a significant effect on treatment failure. The median follow-up time was 63 months (19~111 months). Log rank test was used to estimate the prognostic factors for treatment failure.

**Results:** Overall survival, disease free survival, locoregional recurrence and distant metastasis rates were not significantly different between the two treatment groups. During the follow-up period, 11 patients (12.5%) in the mastectomy group and 10 patients (11.8%) in the BCT group were failed. Six local recurrences occurred after mastectomy and 5 after BCT. Five patients failed at distant site in mastectomy and 4 in BCT. Of the local recurrence cases, five of 6 mastectomy patients and 3 of 5 BCT patients were alive with no evidence of disease after salvage surgery and/or chemoirradiation. Our results indicated that the major influence on survival was distant metastasis. Unfortunately, control of distant metastasis was not frequently achieved. Even with salvage systemic therapy or radiotherapy, most of distant metastasis patients died or had uncontrolled disease in both treatment groups: only one of 4 BCT patients and none of mastectomy patients were alive without disease. There was no apparent difference in the incidence rate of contralateral breast cancer and non-breast 2<sup>nd</sup> primary tumor between the two treatment groups. Univariate Log-rank test identified the N stage and the involved axillary LN number as distinct prognostic factors that were highly predictive of treatment failure in both treatment groups. Additionally, marginal status in BCT and histologic nuclear grade in the mastectomy group were risk factors for treatment failure ( $p < 0.05$ ).

**Conclusion:** Although further careful follow-up is necessary to confirm the trends evident in this series, it would appear that patterns of failure and survival rate following conservative surgery and radiotherapy in early breast cancer are similar to those following mastectomy. The great majority of patients with local recurrence had an excellent salvage rate in both treatment groups. Therefore, these preliminary short term results support BCT as an equally effective management for early breast cancer as an alternative to mastectomy.

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**Key Words:** Early breast cancer, Breast conservation therapy, Mastectomy, Failure pattern

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Submitted December 12, 2003, accepted May 28, 2004  
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This study was supported by a grant from the Catholic Cancer Center.

### Introduction

In addition to many uncontrolled series, several randomized trials have been published that treatment outcome of breast conservation therapy and mastectomy in early breast cancer were no difference in overall and relapse free survival

between two treatment option.<sup>1~7)</sup> Recently, three groups published their 20-year results, which support this assertion.<sup>8~10)</sup>

In 1990, the National Institutes of Health Consensus Development Conference on the Treatment of Early Breast Cancer concluded that breast conservation is an appropriate method of therapy for most women who have stage I, II breast cancer because it yields comparable survival to mastectomy while preserving breast. Several randomized trials gave impressive evidence of the favorable impact of radiation on the loco-regional recurrence, so that postoperative radiation has acquired a firm place in this therapeutic context.<sup>11~15)</sup>

Despite the overall convincing results, the breast conservation therapy is always accompanied by concerns about local-regional recurrence. We retrospectively reviewed 171 patients of stage I, II breast cancer of Kangnam St. Mary's hospital treated with BCT or mastectomy between 1989 and 1996. We compared survival rate, failure pattern of BCT with mastectomy and analyzed long term outcome of failed patients in each treatment group. We also placed particular emphasis on the evaluation of possible link between risk factors and treatment failure in each treatment group.

## Materials and Methods

### 1. Patients selection

Between 1989 and 1996, 171 women with AJC clinical stage I, II early breast cancer have been treated by excision and postoperative RT (BCT) or mastectomy at Kangnam St. Mary's hospital. A retrospective review was conducted to determine survival rate and failure rate in two treatment arms. We analyzed failure pattern and important prognostic factors that linked to treatment failure. We also compared long term outcome of failed patients in each treatment group. Treatment outcome measured in this study were overall survival, disease free survival, disease failure defined as local recurrence, regional recurrence, distant metastasis, contralateral breast cancer and non-breast new primary tumor.

### 2. Characteristics of patients

Table 1 lists the relevant features of the patients and their breast tumor in each treatment group. The distribution of patients among the each treatment group according to their age, AJCC stage, axillary lymph node (LN) status, the number

Table 1. Patients Characteristics and Pathologic Findings

|                   |                  | BCT*<br>(n=85) | Mastectomy<br>(n=88) |
|-------------------|------------------|----------------|----------------------|
| Age               | Range            | 23~76          | 27~75                |
|                   | Median           | 46             | 47                   |
|                   | <30              | 2 (2.3)        | 2 (2.3)              |
|                   | 30~39            | 19 (22.3)      | 20 (22.7)            |
|                   | 40~49            | 40 (47.1)      | 38 (43.2)            |
|                   | 50~59            | 16 (18.8)      | 19 (21.6)            |
|                   | 60~69            | 5 (5.9)        | 7 (8.0)              |
| Stage             | 70               | 3 (3.5)        | 2 (2.3)              |
|                   | I                | 41 (48.2)      | 36 (40.9)            |
|                   | IIa              | 28 (33.0)      | 35 (39.8)            |
|                   | IIb              | 16 (18.8)      | 17 (19.3)            |
|                   | III              | 0              | 0                    |
| Tumor size        | T1               | 54 (63.5)      | 41 (46.6)            |
|                   | T2               | 26 (30.6)      | 42 (47.7)            |
|                   | T3               | 3 (3.5)        | 5 (5.7)              |
|                   | Undetermined     | 2 (2.4)        | 0                    |
| LN status         | No               | 63 (74.1)      | 68 (77.3)            |
|                   | N1 (1~3)         | 14 (16.5)      | 14 (15.9)            |
|                   | N1 (4~9)         | 4 (4.7)        | 4 (4.5)              |
|                   | Nx               | 4 (4.7)        | 2 (2.3)              |
| Menopause         | Pre              | 60 (70.5)      | 58 (65.9)            |
|                   | Post             | 21 (24.7)      | 25 (28.4)            |
|                   | Peri             | 4 (4.7)        | 4 (4.5)              |
| Histology         | Invasive ductal  | 72 (84.7)      | 76 (86.4)            |
|                   | Medullary        | 4 (4.7)        | 1 (1.1)              |
|                   | Mucinous         | 3 (3.5)        | 2 (2.3)              |
|                   | Invasive lobular | 0              | 3 (3.4)              |
|                   | Micellaneous     | 6 (7.0)        | 6 (6.8)              |
| Hormonal receptor | Positive         | 30 (35.3)      | 57 (64.8)            |
|                   | Negative         | 11 (12.9)      | 14 (15.9)            |
|                   | Unknown          | 44 (51.8)      | 17(19.3)             |
| Margin            | Positive         | 8 (9.4)        | 0                    |
|                   | Negative         | 37 (43.5)      | 0                    |
|                   | Unknown          | 40 (47.1)      | 0                    |

\*Breast conservation therapy

of positive axillary LN, menopausal status and histological type were similar. But mastectomy group included patients of more large tumor size. Axillary lymph node were involved in 18 (20.4%) patients in mastectomy group and 18 (21.2%) patients in BCT. Fourteen of these patients had 1 to 3 positive nodes and 4 patients had more than 4 nodes in each treatment group. Unfortunately, it was not possible to ascertain accurate marginal status in 40 (47.1%) patients of BCT group because of incomplete assessment of pathologic specimen regarding to detailed microscopic margin at the beginning of BCT.

### 3. Treatment

#### 1) Surgery

Eighty-eight patients underwent a mastectomy and 85 patients did conservative surgery with breast irradiation. In BCT group, conservative surgery composed of excision of all macroscopic tumor along with level I, II axillary LN dissection. Among 45 evaluable patients, 8 patients had positive margin. None of these patients received re-excision. Eighty-six (97.7%) patients in mastectomy group and 81 (95.3%) patients in BCT group underwent axillary dissection usually limited to level I, II.

#### 2) Radiation therapy

In BCT group all patients received whole breast irradiation to a total dose of 45~50 Gy/5~6 wks with 180~200 cGy fraction using 6 MV photon beam and then followed by 10~15 Gy boost to the original tumor site using a electron or photon. Forty-five patients (53%) received additional regional lymph node irradiation to supraclavicular LN and/or axilla. Regional node irradiation was done in all patients until 1992 and thereafter only in patients having more than 4 positive axillary LN. Out of 88 patients who underwent mastectomy, no patients received postoperative radiation therapy.

#### 3) Chemotherapy

The adjuvant chemotherapy was administered depending on the status of axillary lymph node, hormonal receptor and menopause and primary tumor size. Adjuvant chemotherapy was administered to 29 patients (34.1%) in BCT and 40 patients (45.5%) in mastectomy group. In BCT group, five patients received chemotherapy with sequential, 19 patients with concurrent and 5 patients with sandwich technique. The most common used regimens were CMF (cyclophosphamide, methotrexate, fluorouracil) in 24 patients followed CAF (cyclophosphamide, doxorubicine, fluorouracil) in 4 patients and AF (doxorubicine, fluorouracil) in 1 patient. In mastectomy group, 40 patients received adjuvant chemotherapy with CMF regimen in 29 patients, CAF in 6 patients and adriamycin in 5 patients.

#### 4) Hormonal therapy

Tamoxifen was administered to 65 patients (76.5%) in BCT group and 57 patients (64.8%) in mastectomy group at a dose of 20 mg orally twice per day for 5 years.

### 4. Statistics

Kaplan-Meier method was used to estimate overall survival and disease free survival rate. Treatment failure were characterized further as local, regional, distant or any combination thereof. In BCT group information regarding the exact location of ipsilateral breast recurrence was inconsistent and not available for meaningful analysis. All second cancer events were recorded. Age at diagnosis, AJCC stage, tumor size, nodal status, positive axillary LN number, histologic type, histologic grade, nuclear grade, hormonal receptor status, margin status, menopausal status, receipt of chemotherapy, receipt of tamoxifen were evaluated with univariate log-rank test for determining prognostic factors linked to treatment failure.

## Results

At median follow up of 63 months (19~111 months), there were no significant differences with regard to overall survival and disease free survival, loco-regional recurrence, distant metastasis rate, contralateral 2<sup>nd</sup> primary breast cancer incidence and non-breast new primary tumor incidence (Table 2).

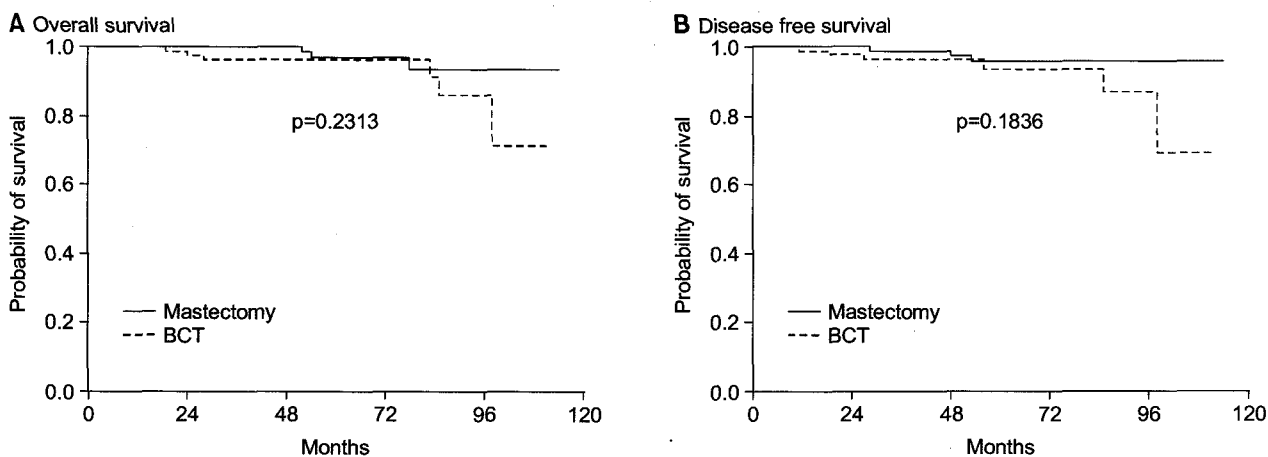
#### 1. Survival

Five-year overall survival rate was 96.4% for BCT group and 97.2% for mastectomy (p=0.2313). With respect to disease free survival, 5 year disease free survival rate was 93.4% for BCT and 95.7 % for mastectomy (p=0.1836). Overall survival and disease free survival curves are plotted over time in Fig. 1. Of the 85 patients receiving BCT, 79 were alive at the last

**Table 2. Number and Crude Incidence of Events in Two Treatment Groups**

| Events                       | BCT*<br>(n=85) | Mastectomy<br>(n=88) |
|------------------------------|----------------|----------------------|
| Treatment failure            | 10 (11.8)      | 11 (12.5)            |
| Local recurrence             | 5 (5.8)        | 6 (6.8)              |
| Regional recurrence          | 3 (3.5)        | 2 (2.3)              |
| Distant metastasis           | 6 (7.0)        | 6 (6.8)              |
| Contralateral breast cancer  | 2 (2.3)        | 3 (3.4)              |
| New primary tumor            | 2 (2.3)        | 3 (3.4)              |
| Overall death                | 6 (7.0)        | 3 (3.4)              |
| Breast cancer specific death | 3 (3.5)        | 3 (3.4)              |

\*Breast conservation therapy



**Fig. 1.** Comparison of (A) overall survival and (B) disease free survival between mastectomy and breast conserving therapy in patients with stage I, II breast cancer after median follow-up 63 months. No statistically significant difference was noted.

**Table 3. Patients Characteristics of 10 Failed Cases in Breast Conservation Therapy**

| Number | Age | Type (M)*                | Stage                         | Salvage Tx     | Follow up status      |
|--------|-----|--------------------------|-------------------------------|----------------|-----------------------|
| 1      | 33  | LR (8)                   | T <sub>1</sub> N <sub>0</sub> | MRM            | NED (24) <sup>†</sup> |
| 2      | 59  | LR (10)                  | T <sub>2</sub> N <sub>0</sub> | RT             | NED (83)              |
| 3      | 46  | LR (23)                  | T <sub>1</sub> N <sub>0</sub> | MRM            | NED (69)              |
| 4      | 44  | RR (44)                  | T <sub>2</sub> N <sub>0</sub> | Chemo-RT       | AWD (11)              |
| 5      | 40  | DM (11)                  | T <sub>1</sub> N <sub>0</sub> | Chemo-RT       | DOD (13)              |
| 6      | 41  | DM (27)                  | T <sub>1</sub> N <sub>0</sub> | Chemotherapy   | DOD (28)              |
| 7      | 43  | DM (35)                  | T <sub>2</sub> N <sub>1</sub> | Chemo-RT       | AWD (17)              |
| 8      | 46  | DM (22)                  | T <sub>1</sub> N <sub>1</sub> | Chemo-HT       | NED (55)              |
| 9      | 50  | LR (56), RR (66), DM (7) | T <sub>1</sub> N <sub>1</sub> |                | DOD (26)              |
| 10     | 45  | LR (45), RR (52), DM (7) | T <sub>1</sub> N <sub>0</sub> | Chemo-RT-HT-OP | AWD (53)              |

\*Failure type (Time to failure in months), <sup>†</sup>Survival duration in months

LR: local recurrence, RR: regional recurrence, DM: distant metastasis, MRM: modified radical mastectomy, RT: radiation therapy, HT: hormonal therapy, OP: operation, NED: no evidence of disease, AWD: alive with disease, DOD: death of disease

follow-up. Three patients died of breast cancer, and remaining 3 patients died of other causes. Three of 88 mastectomy patients died of breast cancer (Table 2).

**2. Treatment failure**

During the follow-up period, 11 patients (12.5%) in the mastectomy and 10 patients (11.8%) in the BCT were failed. Most of them appeared during the first 3 years of initial diagnosis (63.6% in mastectomy, 70% in BCT).

**1) Loco-regional recurrence**

The number of loco-regional recurrence was similar in the two treatment groups. Ipsilateral breast recurrence rate was 5.8% in BCT and 6.8% in mastectomy group. Six local recurrence occurred after mastectomy and 5 after BCT during

follow up periods. Among them one patient in mastectomy and 2 patients in BCT ultimately developed regional recurrence and/or distant metastasis and were not rendered free of disease. But, local recurrence alone patients in both treatment groups were alive with no evidence of disease after salvage surgery and/or chemoradiation (Table 3, 4).

**2) Distant metastasis**

Our results indicated that half of the treatment failure were distant sites and these distribution of events among the two treatment groups was similar (Table 2). Five patients developed distant metastasis in mastectomy and 4 in BCT as the first site of failure. Distribution of metastasis site were as follow multiple bone in 4 patients, lung in 2 patients, multiple site of lung, brain, bone and pleura in 3 patients. Our results

**Table 4. Patients Characteristics of 11 Failed Cases in Mastectomy**

| Number | Age | Type (M)*                | Stage                         | Salvage Tx   | Follow up status      |
|--------|-----|--------------------------|-------------------------------|--------------|-----------------------|
| 1      | 43  | LR (27)                  | T <sub>2</sub> N <sub>1</sub> | RT           | NED (52) <sup>†</sup> |
| 2      | 46  | LR (41)                  | T <sub>2</sub> N <sub>0</sub> | RT, OP       | NED (58)              |
| 3      | 56  | LR (32)                  | T <sub>2</sub> N <sub>0</sub> | RT, OP       | NED (9)               |
| 4      | 62  | LR (22)                  | T <sub>1</sub> N <sub>0</sub> | RT           | NED (48)              |
| 5      | 51  | DM (48)                  | T <sub>2</sub> N <sub>0</sub> |              | DOD (5)               |
| 6      | 53  | DM (53)                  | T <sub>1</sub> N <sub>1</sub> | Chemotherapy | DOD (26)              |
| 7      | 63  | DM (31)                  | T <sub>1</sub> N <sub>0</sub> | RT, HT       | AWD (27)              |
| 8      | 57  | DM (36)                  | T <sub>2</sub> N <sub>1</sub> | RT           | AWD (31)              |
| 9      | 29  | DM (28)                  | T <sub>2</sub> N <sub>0</sub> | RT, HT       | DOD (31)              |
| 10     | 32  | LR (8), RR (75), DM (75) | T <sub>1</sub> N <sub>0</sub> | Chemo-RT     | AWD (17)              |
| 11     | 36  | LR (8), RR (81)          | T <sub>2</sub> N <sub>0</sub> | Chemo-HT     | NED (10)              |

\*Failure type (Time to failure in months), <sup>†</sup>Survival duration in months

LR: local recurrence, RR: regional recurrence, DM : distant metastasis, RT: radiation therapy, HT: hormonal therapy, OP: operation, NED: no evidence of disease, AWD: alive with disease, DOD: death of disease

showed that major influence on survival was distant metastasis. Unfortunately, control of distant metastasis could not frequently be achieved. Even with salvage systemic therapy or radiotherapy more than half of distant metastasis patients were dead with uncontrolled disease in both treatment groups. Only one of 6 distant metastasis patients in BCT and none of mastectomy group were alive without disease (Table 3, 4).

### 3. Second primary tumor

There was no significant difference with regard to development of contralateral 2nd primary breast carcinoma and non-breast new primary tumor between two treatment arms. The contralateral 2nd primary breast cancer appeared in 2 patients (2.3%) in BCT and 3 patients (3.4%) in mastectomy. Non-breast new primary tumor developed in 2 patients (2.3%) in BCT and 3 patients (3.4%) in mastectomy. New primary tumor sites were 2 thyroid papillary cancer and cervix cancer in mastectomy, glioblastoma and ovarian cancer in BCT group. Among these 10 patients of 2nd primary tumor, 3 patients received 6 cycles CMF chemotherapy

### 4. Prognostic factors for failure

With univariate log rank test, overall disease failure was associated with N stage and involved axillary LN number in both treatment groups. Additionally positive surgical margin was strong predictor of recurrence in BCT and high nuclear grade increased the risk of recurrence in mastectomy group (Table 5). Total number of failed patients were only 10 and 11

**Table 5. Prognostic Factors of Disease Free Survival in Two Treatment Groups**

| Factors                        | BCT*<br>(n=85)       | Mastectomy<br>(n=88) |
|--------------------------------|----------------------|----------------------|
|                                | p value <sup>†</sup> | p value <sup>†</sup> |
| Age                            | 0.7617               | 0.3468               |
| Stage                          | 0.6651               | 0.8183               |
| pT stage                       | 0.6360               | 0.6832               |
| pN stage                       | 0.0485               | 0.0483               |
| Number of positive axillary LN | 0.0500               | 0.0256               |
| Histologic type                | 0.7775               | 0.5307               |
| Histologic grade               | 0.6746               | 0.4200               |
| Hormonal receptor              | 0.7473               | 0.4036               |
| Marginal status                | 0.0103               |                      |
| Lymphatic irradiation          | 0.8785               |                      |
| Nuclear grade                  |                      | 0.0470               |
| Chemotherapy                   | 0.4407               | 0.9091               |
| Hormonal therapy               | 0.9039               | 0.1069               |
| Menopause status               | 0.6203               | 0.5631               |

\*Breast conservation therapy, <sup>†</sup>p value with univariate Log rank test

patients in each treatment group so that we can't analyze risk factors for loco-regional recurrence and distant metastasis separately. We did regional node irradiation in all patients until 1992 and thereafter only in patients having more than 4 positive axillary LN. Six patients (13%) failed in regional node irradiated patients, and 4 patients (10.2%) failed in 39 non-irradiated patients. There were no difference of failure site between regional node irradiated patients and non-irradiated patients.

## Discussion

Similar to world-wide trend, the use of breast conservation therapy for early breast cancer has increased during the last decade in our country. Over the period under review, the number of those patients who received conservative therapy was steady increased in our hospital. The results presented are of a relatively small, preliminary one in spite of analyzing the complete series of breast conservation therapy from 1989 to 1996 in our hospital. Specific aim of this study was to determine whether the outcome and pattern of failure for patients treated with lumpectomy following irradiation was equivalent to that for those treated with mastectomy only. The findings reported here like those of earlier report<sup>1~7)</sup> indicate there are no significant difference in the rate of disease free survival and overall survival. After almost 20 years follow-up, the updated results of large randomized trial continue to demonstrate no statistically significant difference in overall survival or disease free survival in patients with early breast cancer who are treated with mastectomy or BCT.<sup>8~10)</sup>

Negative surgical margins in lumpectomy arm were not required in our study. At the beginning of BCT in our hospital there are frequent incomplete assessment of pathologic specimen regarding to detailed microscopic margin. So it was not possible to ascertain accurate marginal status in 40 (47.1%) patients of BCT group. But we could still find out significant correlation between positive margin and recurrence in our study, as like the importance of this factor has been documented in other studies.<sup>16-19)</sup> In our study four of 8 margin positive patients failed during follow up period. Consequently, it was concluded that the combination of lumpectomy and breast irradiation is appropriate therapy, provided that the margins of the resected specimens are free of tumor on histologic examination. The results of 20 years randomized trials reported a major difference in the rate of ipsilateral in-breast failure in BCT group. In NCI study, patients treated BCT were found to have a cumulative 22% in-breast event.<sup>10)</sup> In the National Surgical Adjuvant Breast and Bowel Project (NSABP) trial, the overall rate of ipsilateral failure with tumor-free margins was 14.3%, and that in the Milan trial was only 8.8%.<sup>8,9)</sup> However, the inclusion criteria may explain the higher rate of local failure in the NCI

trial. Although the NCI trial required macroscopic removal of tumor and even permitted a second excision to meet this goal, negative surgical margins on pathologic examination were not required. With unknown or possibly positive surgical margins it would be reasonable to expect a higher in-breast failure rate in the BCT group of the NCI trial than in other 2 trials in which surgical margin status was negative. Positive, or even close margin generally is agreed to be one of the more significant predictors of local failure after BCT.<sup>16~19)</sup> Our results confirmed that finding again with univariate log rank test.

Large randomized studies all demonstrated a statistically significant benefit in local control for radiotherapy in early breast cancer even in a small sized tumor.<sup>1,11,12)</sup> Given the obvious benefit of radiotherapy to a local breast control, three major reasons avoiding routine radiotherapy after conservative surgery were overestimated treatment morbidity, socioeconomic impact on women and limited availability radiotherapy resource. But recent modern radiation techniques spare uninvolved tissue and avoid cardiac damage. For the socioeconomic impact is concerned, it would be justify performing total mastectomy but dose not support doing conservative surgery alone. Twenty-year follow up of NSABP study showed the cumulative incidence of recurrent tumor in ipsilateral breast was 14.3% in lumpectomy and breast irradiation as compared with 39.2% in lumpectomy alone ( $p < 0.001$ ).<sup>8)</sup> This benefit of radiation therapy was independent of axillary nodal status. The value of irradiation in reducing the incidence of ipsilateral breast recurrence after lumpectomy continues to be significant.

Although the ipsilateral breast recurrence did not have compromise survival in the the analysis by Fisher et al,<sup>13)</sup> they found that patients with ipsilateral breast recurrence had an increased risk of distant relapse. Our result also demonstrated 2 ipsilateral breast recurrent patients subsequently developed regional recurrence and distant metastasis and were not rendered free of disease. Similar analysis was done recently by the Ontario Oncology Group.<sup>14)</sup> They also found that patients who experienced ipsilateral breast recurrence did have compromised survival and that patients with early ipsilateral breast recurrence had the worst survival. These finding suggest that local recurrence may have more significance than we have far believed.

Recent NCI 20 years follow up data showed ipsilateral

breast recurrence successfully salvage by mastectomy, but long term in breast failure continued to occur throughout the follow up duration.<sup>10)</sup> The NSABP also observed 39.7% of recurrences in the ipsilateral breast were detected within the first 5 years, 29.5% at 5 to 10 years, and 30.8 % after 10 years and advocated the need for long-term follow-up in clinical trials.<sup>8)</sup> After 20 year follow up of Milan study comparing BCT with mastectomy, the probability of recurrent tumor was significantly higher in BCT than in mastectomy (30 of 352 vs. 8 of 349 patients,  $p < 0.001$ ).<sup>9)</sup> Of these 30 cases of recurrent tumor in BCT, 10 appeared in the scar and thus defined as true recurrence, whereas 20 occurred in other quadrants of breast and were therefore classified as second ipsilateral carcinoma. The timing of the two kinds of events also different. True local recurrence appeared a median 92 months and second ipsilateral carcinoma appeared a median of 117 months. The crude incidence of local recurrence was same until 5 years after treatment between 2 groups as like that of observed in our study.

In Fisher's report,<sup>1)</sup> patients with positive axillary node who underwent lumpectomy followed by breast irradiation, all of whom received chemotherapy had a lower rate of recurrence than did patients with negative node who were treated with breast irradiation but no systemic therapy. This finding support that effects of the two therapies additive of synergistic. However, systemic therapy is now administered after lumpectomy regardless of nodal status, to reduce the risk of distant metastasis. With optimal surgical and radiation therapy, as well as an increase in the use of more effective systemic therapy likely to result in an incidence of recurrence of breast cancer is lower than that observed previous trial. The temporal order in which patients with early stage invasive breast cancer receive chemotherapy and radiation therapy may affect the clinical outcome. As yet no randomized trial has addressed this issue directly. JCRT (Joint Center for Radiation Therapy) conducted a randomized trial to test whether the sequence of administration of chemotherapy and radiation therapy after breast conserving surgery influences the outcome among patients at substantial risk for systemic recurrence.<sup>14)</sup> They found the giving chemotherapy first had better overall results but associated with an increased risk of local recurrence.

There has been concerned that postoperative breast irradiation may increase the risk of cancer in the contralateral breast.

Even twenty years follow-up duration of Milan, NCI and NSABP may not be sufficient to account for radiation induced carcinogenesis, those studies did not detect any increase in the incidence of contralateral breast cancer in BCT. There was also no difference in incidence of contralateral breast cancer between two treatment arms in our 5 year follow-up study.

Our results indicate that major influence on survival was distant metastasis. Finding of Milan study<sup>9)</sup> that the survival rate was same in both of BCT and mastectomy group, even though the rate of local recurrences was higher in the BCT after 20 year, supports our result. The long term outcome of breast cancer linked to the presence or absence of distant metastasis not to the extent of local surgery in early breast cancer.

This retrospective study was early preliminary results of our hospital comparing BCT with mastectomy. It would appear that patterns of failure and survival rate following conservative surgery and radiotherapy in early breast cancer are similar to those following mastectomy. Overall disease failure was associated with N stage and involved axillary LN number in both treatment group. And positive surgical margin in BCT and high nuclear grade in mastectomy group were strong predictor of recurrence. Recent three randomized long term follow up data show a substantial events occurred after 5 years, so further careful follow-up is necessary to confirm the trends we have seen in this study.

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## 국문초록

## 조기유방암에서 유방보존치료와 유방전절제술의 치료결과 및 실패양상 비교

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**목적:** 조기 유방암에서 유방보존치료(유방보존수술 + 방사선치료) 혹은 유방전절제술로 치료했던 환자의 초기 치료성과 실패양상을 비교하고자 후향적으로 분석하였다.

**대상 및 방법:** 1989년 3월부터 1996년 8월까지 강남성모병원에서 AJCC병기 I, II로 치료를 받았던 유방암 환자를 대상으로 하였다. 88명은 유방전절제술을 시행하였고 85명은 유방보존술 후 방사선치료를 시행하였다. 방사선치료는 50 Gy 전 유방조사 후 원발부위에 10~15 Gy 추가 조사하였다. 유방보존치료 환자의 34.1%, 유방전절제 환자의 45.5%에서 항암화학요법이 병용되었다. 양 치료군의 5년생존율과 5년무병생존율, 실패양상을 비교하였으며 치료실패와 연관된 위험인자를 Log-rank test를 이용하여 분석하였다. 중앙 추적기간은 63개월이었다.

**결과:** 양 치료군 간에 5년생존율, 5년무병생존율의 유의한 차이( $p > 0.05$ )는 없었으며 국소재발 및 원격전이 의 치료실패양상에도 차이가 없었다. 추적기간 중, 유방전절제군에서 11명(12.5%) 유방보존치료군에서 10명(11.8%) 재발하였다. 초기 실패양상은 국소재발이 각각 6명, 5명이었고 원격전이가 각각 5명, 4명으로 차이가 없었다. 국소재발 단독의 경우 양 치료군에서 구제치료 후 대부분의 환자가 무병생존 (5/6 유방전절제술, 3/5 유방보존치료)하였다. 그러나 원격전이 환자의 경우 양 치료군 모두에서 방사선-항암화학요법의 구제치료에도 불구하고 대부분의 환자가 진행 혹은 사망하였으며 유방보존치료군의 1명의 환자만이 원격전이 후 구제치료에 성공하여 무병생존하였다. 양 치료군 간에 반대편유방암 발생률 및 다른 장기의 2차 원발암 발생률의 차이는 없었고 유방암으로 인한 사망률도 차이가 없었다. Log-rank 단변량분석에서 치료 실패와 관련된 유의한 위험인자는 양 군 모두에서 N 병기, 액와 림프절 전이 숫자였으며 유방보존치료군에서는 수술절연침 범유무가, 유방전절제군에서는 high nuclear grade가 치료실패와 관련된 위험인자였다( $p < 0.05$ ).

**결론:** 초기 분석결과 AJCC 병기 I, II 조기유방암에서 유방보존치료와 유방전절제술은 생존율뿐 아니라 치료 실패양상에도 차이가 없었으며 향후 이와 같은 결과를 확인하기 위한 장기간의 추적연구가 필요하다.

**핵심용어:** 조기유방암, 유방보존치료, 유방전절제술, 실패양상