

Clinical Studies of Breast Cancer in the Inner Half^{f*)}

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ABSTRACT

The result of our recent review on 112 cases of inner half breast cancer that had been initially operated during the past 20 years at the Second Department of Surgery, Hiroshima University School of Medicine, indicated the following data:

- 1) The inner half group showed worse prognosis than the outer half group. ($p < 0.05$)
- 2) Slightly good results were observed on the Ps-dissection-added cases in the inner half group (no significant difference).
- 3) There were no Ps (+) cases observed in the Ax (-) group.
- 4) The number of Ps (+) cases was increased at Ax (+) group ($p < 0.01$) or T₃ ($p < 0.05$).
- 5) In selecting the operative method, it is important to consider, especially, the nodal status and the size of tumor.
- 6) It cannot be said that the radiation therapy on the affected part after operation is always effective.
- 7) There was a relatively fixed pattern in the occurrence of Ps nodal metastasis and in the type of their recurrence (no significant difference).

INTRODUCTION

Efforts for improving the breast cancer surgical therapy have been made based on the conventional Halsted-Meyer's radical mastectomy. With the improvement of diagnostic technique, minor surgeries, especially, for early breast cancer are being taken into consideration. For inner half breast cancer, however, its therapeutic plan including parasternal nodal metastasis should be considered naturally difference from that for outer half breast cancer. We have reviewed with some referential consideration the inner half breast cancer cases that we had experienced during the past 20 years from 1964 to 1983, mainly concerning about nodal status, size of tumor, operative method, prognosis and recurrence.

MATERIALS AND METHODS

During the past 20 years from 1964 to 1983,

we had performed at the 2nd Department of Surgery, Hiroshima University School of Medicine a total of 259 initial breast cancer operations, of which 112 cases of inner half breast cancer were mainly reviewed based on the General Rules for Clinical and Pathological Record of Mammary Cancer⁴⁾.

All the inner breast cancer patients were female at an average age of 50.3 ± 11.0 . They were classified by the main occupying area into 4 types: the upper-inner quadrant ("A" portion) of 68 cases, the lower-inner quadrant ("B" portion) of 15 cases, the subareolar ("E" portion) of 16 cases and the inner invasion (diffuse type) of 13 cases from the outer half beyond the internal nipple line. By the end of 1983, 98 cases (87.5%) were successfully traced out including 30 deaths during the follow-up, of which 3 were deaths of certain other diseases.

According to the clinical staging (new TNM classification⁴⁾), they consisted of 1 of T_{is}, 32

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of Stage I, 40 of Stage II, 29 of Stage III and 7 of Stage IV.

The numbers of the operative methods for simple mastectomy, modified radical mastectomy and radical mastectomy were collectively counted as for mastectomy only (58 cases).

The radiation therapy was performed at about 5,000–6,000 rad. of ^{60}Co -irradiation and high-energy X-ray by Lineac before and after 1973, respectively, on the chest wall centering around parasternal (Ps), supraclavicular (Sc) and axillar (Ax).

The first recurrence sites were collectively counted as the soft tissue including chest wall, lymph nodes and the opposite mammary gland and as the organ including lung, liver, brain, etc.

Also, we performed this statistical analysis in following test; Z-value test in Fig. 1, 2, 3, 4 and chi-square test in Table 1, 2, and Fig. 5.

RESULTS

1. Locations, Ages, Sexes and Clinical Stages

The total of 259 cases of initial breast cancer surgery performed at our 2nd. Department of Surgery included 112 cases of inner half breast cancer (43.2%) and 147 of outer half. They were classified by the main limited occupying location into 68 "A" cases (26.3%), 15 "B" cases (5.8%), 126 "C" cases (48.6%), 34 "D" cases (13.1%) and 16 "E" cases (6.2%). The inner cases were all female at an average age

of 50.3 ± 11.0 and the outer cases including 1 male, at 50.0 ± 11.0 .

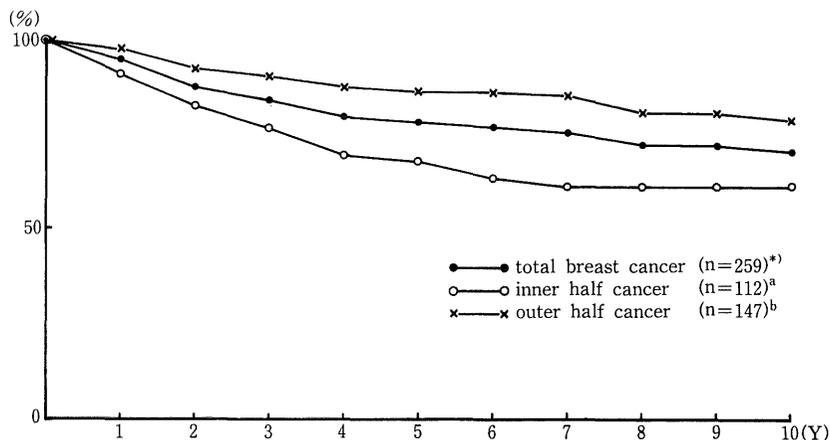
According to the clinical staging, the inner group consisted of 1 Tis case, 32 of Stage I, 40 of Stage II, 29 of Stage III and 7 of Stage IV; and the outer group of 2 Tis cases, 48 of Stage I, 82 of Stage II, 13 of Stage III and 2 of Stage IV.

2. Ten-year Cumulative Survival Rate

As shown in Fig. 1 giving the respective 10-year cumulative survival rates for the total, inner half and outer half groups, the inner half group's rate (61.5%) was lower by 16.9% than that of the outer half group (78.4%). ($p < 0.05$) The 5-year crude survival rates for the traceable cases by 1977 (56.9% for inner and 82.8% for outer) showed the similar tendency as above.

Next, the inner half group of 108 cases except one Tis case and 3 death cases of other diseases was investigated for its 10-year cumulative survival rate (Fig. 2), which showed 92.2%, 62.3% and 34.2% of Stage I, II and III, respectively, and the total death of Stage IV within 5 years except one death in 5.8 years (significant difference between Stage I and II).

The 10-year cumulative survival rates of 108 cases of the inner half group were calculated by the operative method (Fig. 3). The rates were almost the same for the first 3 groups as 70.5% of mastectomy only, 66.6% of mastectomy+irradiation and 71.5% of mastectomy+Ps nodal dissection, but not for 43.6% of mastectomy+irradiation, respectively (no sig-



*) excluding 3 cases who had died in other diseases.
 significant difference between a and b. ($p < 0.05$)

Fig. 1. Ten-Year Cumulative Survival Rate according to Location of Tumor

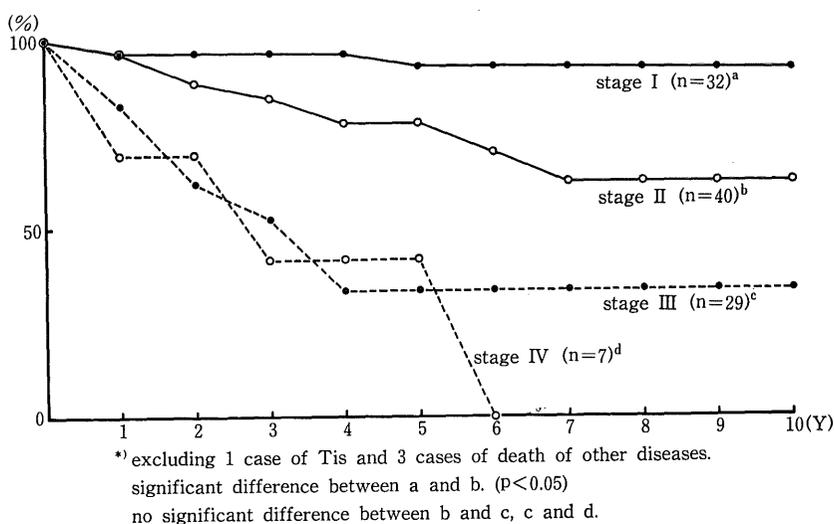


Fig. 2. Ten-Year Cumulative Survival Rate of Inner Half Tumor according to Clinical Stage^{*)}

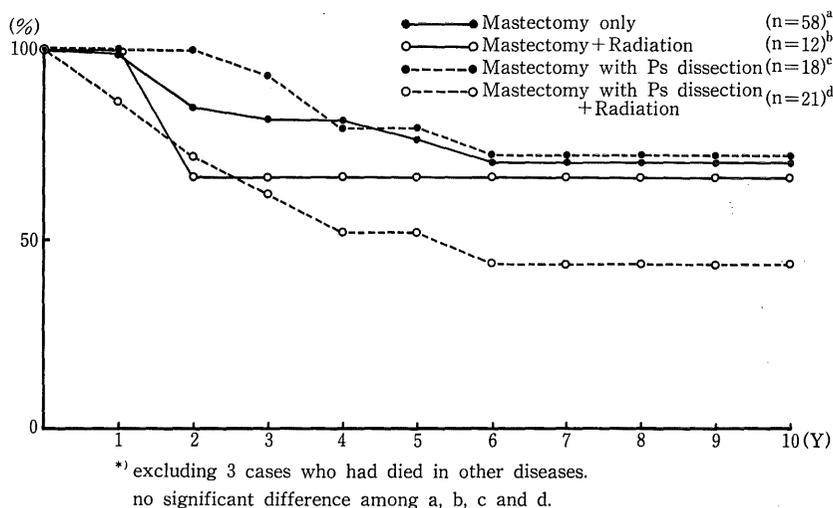


Fig. 3. Ten-Year Cumulative Survival Rate of Inner Half Tumor^{*)} according to Operative Method

nificant difference).

Next, the cumulative survival rates were compared by the nodal status (Fig. 4). In the n_0 cases, the rate for the Ps dissection-added group, 92.3%, was slightly higher than that for the non-Ps dissection group, 87.1% (subtotal 89.2%) (no significant difference). Also, in the n_1 ($n_{1\alpha} + n_{1\beta}$) cases, the Ps dissection-added group was also slightly better than the non-Ps dissection group as 57.0% and 49.6%, respectively (subtotal 53.2%) (no significant difference).

3. Correlativity between Nodal Statuses (Ax and Ps)

Four cases of Ps dissection-added inner breast cancer were investigated for the presence of lymph node metastasis in axillar (Ax) and parasternal (Ps), as showed in Table 1. There were no parasternal node positive cases in the axillar lymph node negative group while Ax and Ps were correlated for the presence of nodal metastasis ($\chi^2 = 9.72$, $p < 0.01$). Also, in 12 cases of Ps dissection-added outer breast

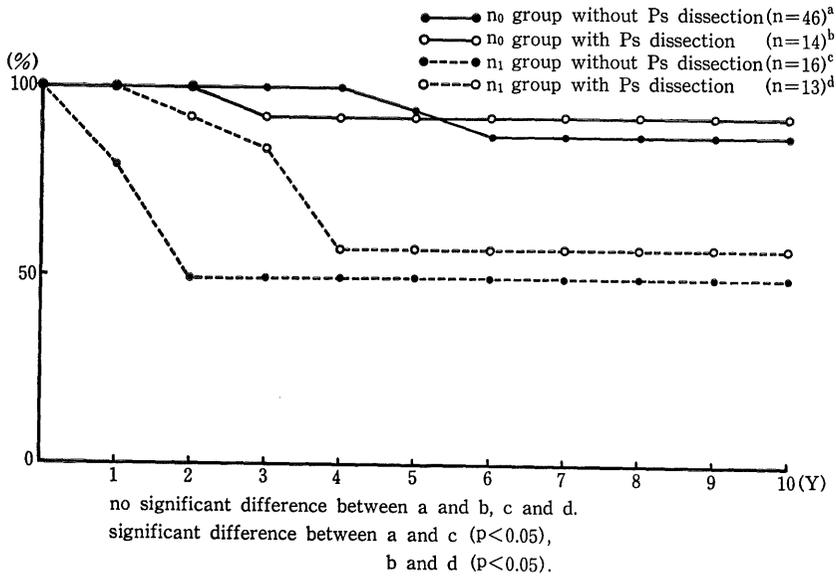


Fig. 4. Ten-Year Cumulative Survival Rate according to Parasternal L. N. Dissection and Nodal Status (n_0 or n_1)

Table 1. Prognosis of Inner Half Tumor according to Nodal Status (Ax and Ps)

| | Ps (-) | Ps (+) |
|--------|--------------|-----------|
| Ax (-) | 17 (92.3) | 0 |
| Ax (+) | 12 (63.6) | 12 (0) |

(): 5-Year cumulative survival rate (%)
 $\chi^2=9.72$; significant difference between nodal status of Ax and Ps ($p < 0.01$)

Table 2. Parasternal Lymph Node Metastasis associated with T-Factor on Ps Dissection

| | T ₁ | T ₂ | T ₃ | T ₄ | total |
|--------------------|----------------|----------------|----------------|----------------|-------|
| Ps (-) | 11 | 12 | 5 | 1 | 29 |
| Ps (+) | 1 | 3 | 6 | 2 | 12 |
| Ps(-)+Ps(+) (%) | 1/12 (8.3) | 3/15 (20.0) | 6/11 (54.5) | 2/3 (66.7) | 41 |

$\chi^2=6.07$; S. D. between (T₁+T₂) and (T₃+T₄) group ($p < 0.05$)

cancer including 6 cases of Ax (-) Ps (-) group, 5 of Ax (+) Ps (-) and 1 of Ax (+)

Ps (+), there were no cases of Ax (-) Ps (+).

4. Size of Tumor and Ps Nodal Status

As showed in Table 2, higher Ps nodal metastatic rates were observed as the tumor sized increased. However, there was no significant differences between the adjacent tumor sizes of T₁ and T₂, T₂ and T₃, and T₃ and T₄; but a significant difference was observed between the group of (T₁+T₂) and (T₃+T₄) ($\chi^2=6.07$, $p < 0.05$).

5. First Recurrence Site

The 30 death cases in inner half group were reviewed for their causes and first recurrence sites (Fig. 5). Of the 27 cases except 3 deaths of other diseases, 13 of non-Ps metastasis group mostly showed distant metastasis including 5 (38.5%) bone metastasis of vertebra, pelvis, skull, ribs, etc.; 5 (38.5%) organ metastasis of lung, liver, brain, etc.; and 3 (23.0%) soft tissue metastasis of lymph node, opposite mammary gland, chest wall, etc. On the other hand, 14 cases of Ps metastasis group included 9 (64.3%) of soft tissue recurrence starting from local recurrence, 1 bone, 3 lung and 1 liver, showing few distant metastasis cases. No significant difference was observed in the type of recurrence due to presence or absence of Ps nodal metastasis ($\chi^2=3.12$).

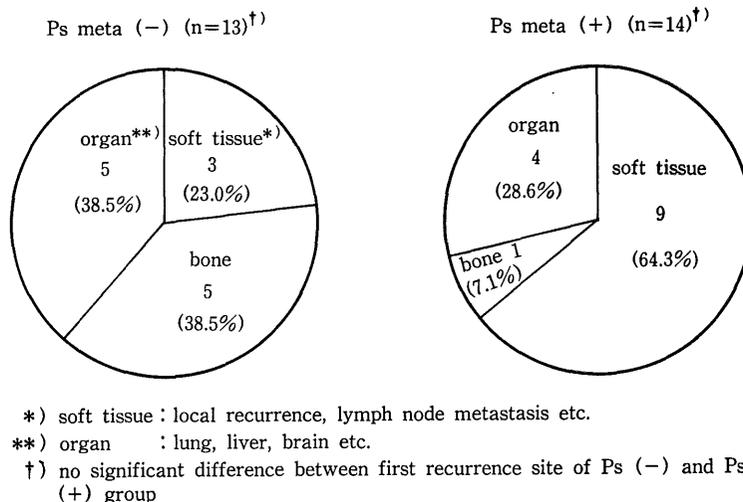


Fig. 5. First Recurrence Site on Dead Cases of Inner Half Cancer

DISCUSSION

Different measures should be considered in planning the therapy for inner half breast cancer from that for outer half breast cancer because the former is liable to metastasize to parasternal lymph node. Especially, the authors vary in judging the effects of the surgical and radiation therapies mainly used for parasternal lymph node metastasis cases. Therefore, the following problems were discussed.

1. Selection of Operative Method

Although the extended mastectomy (ER) has been considered effective in the past especially for Ps metastasis cases, recently, doubts about its effectiveness^{8-9,12)} have brought about the tendency toward the minor surgery^{1,2)}. However, Izuo, M. et al.⁶⁾ consider ER effective for Stage II and III of the inner half group, and Nemoto, T. et al.¹⁰⁾, specially, effective for tumors larger than 5 cm in size. Lacour, J. et al.⁹⁾ reports that ER is effective specially for T1 or T2 in the Ax (+) group of inner half breast cancer. In the 10-year cumulative survival rate of our cases, slightly better results were obtained for the large-part removed groups of mastectomy only, 70.5%, and Ps dissection-added, 71.5%, with no significant difference observed. In the n_0 or n_1 group, especially, data suggesting the effectiveness of Ps dissection were not obtained.

2. Nodal Status

As reported by Nemoto, T. et al.¹⁰⁾, Veronesi,

U. et al.¹³⁾ and Handley, R. S.⁵⁾ many inner half cases fall in Ps (+), and therefore, it is important to search for Ps in inner half cases, in particular. Veronesi, U. et al.¹³⁾ state that their prognosis depends on the presence of Ps metastasis. The 10-year survival rate of the Ps (-) and Ps (+) groups of our cases are 89.2% and 53.2%, respectively, showing the tendency of correlation between the Ax (+) and Ps (+) groups ($p < 0.01$). In cases of Ax (+) in the inner half group, Ps dissection suggests its significance in the selection of therapy and the judgement of prognosis rather than the effect of dissection.

3. Prognosis and Recurrence

Fisher, B. et al.⁹⁾ and Lacour, J. et al.⁹⁾ deny that the recurrence rate of inner half is higher than that of outer half. Also, there are many literatures^{10,11)} reporting that the 5-year survival rate is slightly lower for inner half but with no significant difference. In our study, the 10-year cumulative survival rate showed poor prognosis of inner half, 61.3%, considerably lower than outer half, 79.1%. This raises problems of the definition of inner half breast cancer and the deviations between each clinical stages of inner and outer breast cancers. In this study, further investigation was difficult due to few available cases.

The recurrence sites are described by Yoshida, M. et al.¹⁴⁾ that most of the Ax (-) group of total breast cancer recur by distant metastasis and many of the Ax (+) (with lymph

nodes ≥ 8) group, to the tumor site or its surrounding soft tissue. A similar tendency to this of the presence of Ps metastasis and the type of recurrence was observed in our cases (inner half group) giving distant metastasis, 77.0%, for Ps (-), soft tissue recurrence, 64.3%, for Ps (+). As Lacour, J. et al.⁹⁾ state that the local recurrence rate is higher for the mastectomy-only group than for Ps dissection (ER) group, further study will be needed for the significance of irradiation on or dissection of Ps lymph node.

4. Radiation Therapy

Although the radiation therapy is considered especially for inner half breast cancer after operation, there are many reports denying a higher survival rate by irradiation¹⁰⁻¹²⁾. In our cases, the irradiation-added group showed a tendency of rather poor prognosis regardless of operative method. The reason for this is considered that the irradiated cases fall in higher stages. More precise investigation by each clinical stage will be needed.

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