

Partial Mastectomy with Axillary Lymph Node Dissection and Radiotherapy as a New Treatment Modality of Breast Cancer (I)

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This is the first preliminary report among two consecutive papers. Partial mastectomy(PM), axillary lymph node dissection(AD) and radiotherapy (RT) were performed on seventeen operable breast cancer patients who had been admitted from April 1991 to March 1992 to the department of surgery, Yongdong Severance Hospital for improved cosmetic appearance and better survival rate. Of seventeen patients, 47% were T1 lesion and 76% were stage I and II. Extensive intraductal component(EIC) within or around the tumor was also analyzed. Twenty nine per cent of the patients were EIC positive. The mean number of axillary lymph nodes was 21.5 after PM with AD and 20.5 after mastectomy. For radiotherapy, 4,500 rad was delivered to the breast parenchyme and 1,600 rad of boost to the primary tumor site using the electron beam method after surgery. All patients have since been living well without any local recurrence and were satisfied with breast preservation for the one-year follow-up period. We concluded that the PM, AD and RT can be another surgical treatment modality of breast cancer. A longer follow-up data will be followed on the second paper.

Key Words: Partial mastectomy, radiotherapy and breast cancer

Apparent loss of femininity has been considered one of the major problems after a mastectomy (Jameson et al. 1978). Studies indicated that between 10% to 56% of women followed after mastectomy had some degree of impairment of social or emotional function such as poor effect on their body images and appearances, diminished sense of femininity, decrease in sexual attractiveness and function, and shame and guilt (Maguire 1976; Polivy 1977; Morris et al. 1977; Harris et al. 1991). In order to improve cosmetic results and survival rate,

lots of limited resections have been tried, and a number of nonrandomized studies have reported that conservative surgery and radiotherapy give survivals and locoregional control rates similar to those achieved with radical or modified radical mastectomy (Almaric et al. 1982; Haffty et al. 1989; Montague et al. 1984; Osborne et al. 1984). Fascinating randomized trials of ablative surgery versus conservative surgery and radiotherapy also have been reported (Fisher et al. 1989; Haywad 1987; Sarrazin et al. 1984; Veronesi et al. 1986). It seems that conservative surgery and radiotherapy are as effective as modified radical or radical mastectomy for stage I or II breast cancer. In addition to equivalent survival by PM, AD and RT, their cosmetic appearances are excellent. We attempted to assess the availability of PM, AD and RT for operable breast cancer patients who had been admitted to the department of surgery, Yongdong Severance Hospital.

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PATIENTS AND METHODS

Of forty one patients who had surgery for breast cancer from April 1991 to March 1992 at Yongdong Severance Hospital, modified radical mastectomy was performed in 21 patients (52%), radical mastectomy in one patient, PM, AD and RT in 17 cases (42%) and total mastectomy with low axillary lymph node dissection in two cases due to ductal carcinoma in situ and Paget's disease pathologically. Increased number of patients for obtaining statistical significance will be added in the following paper.

Surgical techniques: In order to achieve better cosmetic results, either the areola or the nipple were preserved when the tumor was not located centrally. Skin incision was made over the primary tumor along Langer's line and circumareolar incision was sometimes used for the tumor not far from the areola, with great care taken not to make a long subcutaneous tunnel. Partial mastectomy was done with clear margins microscopically. Full axillary lymph node dissection was performed through a separate transverse skin incision in the axilla. The specimen was oriented for pathologists by applying suture tags to tumor margins in which inking was already made with a dark solution. Breast parenchyme was approximated with Dexon 2-0 sutures and hemo-vac suction drain was placed, and finally the skin was closed with a subcuticular method.

Radiotherapy techniques: Radiotherapy was given with a 4Mev linear accelerator X-ray. Boost doses were to the primary tumor site given with 9-15 Mev electron beam. According to the axillary nodal involvement status, treatment volume varied from the breast alone to the breast and supraclavicular nodes, with or without axillary nodes. Radiotherapy to the breast was given through tangential fields, and supraclavicular and axillary nodes were treated with anterior ports. Bolus was rarely used over the breast. The dose to the entire breast was usually 45 Gy, delivered at 1.8 Gy per fraction, given five times a week. The boost dose to the primary tumor site was 16-20 Gy, at 1.8 to 2.0 Gy per fraction. For the patients with four or more positive nodes, the supraclavicular field was treated with 45 Gy in 5 weeks, usually prescribed at 3 cm depth.

Pathologic examinations: Fresh breast specimens were sent to the department of pathology for frozen section at the time of surgery to confirm the di-

agnosis of infiltrating ductal carcinoma and to know whether the lesion was comprised of extensive intraductal components (more than 25% within or adjacent to the tumor), and whether the margins were free of cancer cells or not. Remaining frozen tissues and fresh tumor specimens were fixed in 10 % neutral formalin, embedded in paraffin and cut with 4 to 5 micrometers in thickness. Blocks were selected carefully so as to give good representation of the whole tumor. Conventional hematoxylin-eosin (H&E) stain was done. All parts of the tumor were scanned microscopically and nuclear and histologic gradings were carried out according to the Bloom and Richardson (1957) numerical scoring system as follows.

I. Tubule formation

Score 1: Tubules with clearly visible lumina

Score 2: Definite tubule formation accompanied by solid areas

Score 3: Little or no tubule formation

II. Nuclear pleomorphism

Score 1: Nuclei are regular and show little variation in size and shape

Score 2: Moderate variation without extremes of cell size or shape. Nucleoli are often present

Score 3: Marked variation; especially large and bizarre nuclei.

Nucleoli are often present and sometimes multiple.

III. Mitotic rate

Score 1: Less than 10 mitoses/10 HPF

Score 2: 10-19 mitoses/10 HPF

Score 3: 20 or more mitoses/10 HPF

Grade:I. 3,4 or 5 points: grade I-well differentiated

II. 6 or 7 points: grade II-moderately differentiated

III. 8 or 9 points: grade III-poorly differentiated

RESULTS

A total of 41 patients had operations for carcinoma of breast cancers. Modified radical mastectomy was performed in 21 patients (52%) and standard radical mastectomy in 1 patient (2%), total mastectomy and low axillary lymph node dissection in 2 patient(4%). Partial mastectomy with axillary dissec-

Table 1. Types of surgery performed for breast cancers

Operation	No. of patients	Percent
MRM ^a	21	52
SRM ^b	1	2
PM-AD ^c	17	42
TM-LAD ^d	2	4
Total	41	100

a: MODIFIED RADICAL MASTECTOMY

b: STANDARD RADICAL MASTECTOMY

c: PARTIAL MASTECTOMY WITH AXILLARY NODE DISSECTION

d: TOTAL MASTECTOMY WITH LOW AXILLARY NODE DISSECTION

Table 2. Tumor size in patient with partial mastectomy with axillary dissection (PM-AD)

Tumor size	No. of patients	Percent
Less than 2 cm	8	47
2~5 cm	8	47
More than 5 cm	1*	6
Total	17	100

*: 3.2×5.2 cm (Large and Pendulous Breast)

tion and radiotherapy was done in 17 patients, 42 percent of the operations (Table 1).

Of seventeen patients who had partial mastectomy with axillary dissection, 8 patient (47%) were T1 lesion and another 8 patients, T2 lesion and only one had pendulous breast with T3 lesion (5.2 cm in its diameter). According to their tumor size and lymph node status, staging was done by using the TNM classification proposed by the International Union Against Cancer (UICC) and the American Joint Committee on Cancer (AJCC). Four patient (24 %) were stage I and 6 patients (35%) were stage IIa and 3 patients (17%) were stage IIb. Among four patients (24%) with stage IIIa, 3 had four or more positive axillary lymph nodes and 1 had a 5.2 cm sized tumor (Table 2 and 3).

The number of lymph nodes dissected was 10 to 29 (mean 20.5) in patients who had modified radical mastectomy and 13 to 37 (mean 21.5) in patients who had partial mastectomy and axillary dissection (Table 4).

Extensiveness of intraductal component (EIC)

Table 3. Stages in patients with partial mastectomy with axillary dissection (PM-AD)

Stage	No. of patients	Percent
I	4	24
IIa	6	35
IIb	3	17
IIIa	4	24
	17	100

Table 4. Number of lymph nodes

Operation	No. of patients	No. of Lymph nodes (Mean)
MRM*	21	10-29 (20.5)
PM-AD**	17	13-37 (21.5)

*: MODIFIED RADICAL MASTECTOMY

**: PARTIAL MASTECTOMY with AXILLARY NODE DISSECTION

Table 5. Extent of intraductal component (I.C.)

I.C.	No. of Patients	Percent
Less than 25%	12	71
More than 25%	5	29
	17	100

within or around the tumor was also analyzed. In patients who had partial mastectomy with axillary dissection, 12 patients (71%) had intraductal component less than 25 percent and 5 patients (29%) had more than 25 percent (Table 5). Four (24%) out of seventeen patients were Grade III histologically.

As surgical complications, seroma developed in 2 cases and was treated without difficulty. Slight fibrosis, retraction and pigmentation developed after radiation therapy. No patients developed severe fibrosis, skin dryness, pericarditis, subclavian artery occlusion or induction of secondary tumors like leukemia or sarcoma.

All patients were good to excellent in their cosmetic appearance, and had been living well without any local recurrence and were satisfied with their

breast preservation surgery for a one-year follow-up period by checking up 3-month intervals.

DISCUSSION

Patterns of surgical treatment for breast cancer have been changing for more than one hundred years since Williams S. Halsted performed his first radical mastectomy at the Roosevelt Hospital, New York City in 1882 and published his results with 50 patients in 1894 (Halsted 1894). The extent of radical mastectomy includes all breast parenchyme, axillary lymph nodes and pectoralis major and minor muscles. However, it seems that the extent of surgery is not related to the patient's long-term survival (Lippman ME *et al.* 1988). Modified radical mastectomy sparing pectoralis major muscle have been found to offer equivalent disease-free survival and better functional and cosmetic results comparing to radical mastectomy (Osborne and Borgen 1990). In 1960, the incidence of modified radical mastectomy began to increase with the falling of radical mastectomy. A large survey conducted by the American College of Surgeons in 1982 includes data from several hundred hospitals in United States showing that the incidence of modified radical mastectomy was 78.2 percent, whereas that of radical mastectomy was 3.4 percent (Wilson, 1984). There are several factors that have contributed to the preference of a lesser extent of surgery. The first one is better understanding of the natural history of breast cancer. It is now well understood that patients in whom subsequent metastatic disease develops after radical mastectomy actually had micrometastases at the time of, or before surgery. The surgical procedure offers no survival advantage for these patients, although local-regional control probably contributes to palliation. The second one is early detection through self examination, periodic examination by a physician and popular use of mammography. An increasing number of cancers are being detected in nonpalpable stages, making possible less extensive surgical approaches. Thirdly, many studies have been found to offer equivalent disease free survival (Montague *et al.* 1984; Veronesi *et al.* 1986; Fisher *et al.* 1989). And lastly, the functional and cosmetic results of surgery can be achieved through a lesser extent of surgery and a patient's awareness of their options (Cady 1990.)

Although the transition from radical mastectomy to modified radical mastectomy greatly improved

the cosmetic and functional results of patients treated, modified radical mastectomy, however, does involve amputation of the breast. Loss of any body part, particularly the breast, has been associated with psychological distress (Maquire GP *et al.* 1978). This observation provided the impetus for the development of breast-preserving treatments of breast cancer. The experience by postoperative radiotherapy demonstrated the ability of moderate dose radiotherapy to eradicate subclinical deposits of the tumor. These results suggested that more conservative surgery, combined with radiotherapy might be an effective means of obtaining local tumor control and breast preservation (Fletcher 1972). Holland *et al.* (1985) studied the existence of multiplicity and their types in 264 mastectomy specimens from the patients with breast cancers measuring 4 cm or less, who were judged suitable clinically or radiologically for the breast preserving treatment. Forty one percent of the specimens showed cancer foci farther than 2 cm from the reference tumor. This was a good match with the increased local recurrence seen in the National Surgical Adjuvant Breast and Bowel Cancer Project (NSABP) B-06 (Fisher 1989). Therefore, postoperative radiotherapy is mandatory and axillary dissection should be done the same as in modified radical mastectomy to remove positive lymph nodes and obtain staging for the breast conservation surgery.

Four major randomized trials of ablative surgery versus conservative surgery have been reported (Fisher *et al.* 1989; Hayward 1987; Sarrazine *et al.* 1984; Veronesi *et al.* 1986). Of those trials, the oldest prospective study at Guy's Hospital differed from other studies in that no axillary dissection was done and that the radiation doses used are now considered inadequate. The other three randomized trials did not show any differences in either locoregional control or survival between the group treated with ablative surgery and that treated by conservative surgery plus radiation. Furthermore, NSABP's 5-year data analyzed by axillary lymph node status revealed no survival differences among treatment arms for node-positive patients, and node-negative patients showed equally good survival rates in all three treatment arms. Recently, 1990's Consensus Meeting was held at National Institutes of Health in the United States, where they concluded that "Breast conservation surgery is an appropriate method of primary therapy for the majority of women with Stage I and II breast cancer and is preferable because it provides survival equivalent to total mastectomy and axillary dissection

while preserving the breast." In this study, seventeen patients with variable tumor sizes and stages had partial mastectomy with axillary dissection and radiotherapy without major complications. Even though their recurrence rate was not analyzed because of the short follow-up period, the cosmetic results were good to excellent in most of the patients. The number of dissected axillary lymph nodes was similar between the group with conservative surgery and that with mastectomy. We concluded that partial mastectomy with axillary dissection and radiotherapy can be a good alternative to conventional mastectomy in operable breast cancer patients. A second report with longer follow-up survival rate and recurrence data will be written soon.

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