

Breast Reconstruction Immediately Following Mastectomy Using Only a Latissimus Dorsi Musculocutaneous Flap

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Summary. Immediate breast reconstruction using a latissimus dorsi musculocutaneous following mastectomy was performed in 22 patients. The clinical stages of the 22 patients were Tis or T0 (noninvasive carcinoma or Paget's disease): 4, I: 14, and II: 4. Fifteen patients underwent the Auchincloss operation, with 4 receiving parasternal dissection. Seven patients underwent a modified Auchincloss operation, and 5 received parasternal dissection. Ten patients developed minor complications such as seroma, hematoma, erosion of the preserved nipple, and partial skin necrosis of the recipient site. Postoperative assessment of the reconstruction showed satisfactory results in the majority of patients. One patient died from pulmonary and liver metastasis with no local recurrence. We conclude that breast reconstruction surgery immediately after mastectomy using the latissimus dorsi (LD)/musculocutaneous (MC) flap alone is a desirable and viable option which provides excellent cosmetic results in selected patients with primary breast cancer.

INTRODUCTION

Breast reconstruction is a useful method of reducing the psychological trauma often accompanying the loss of a breast. Until the middle 1980s, there were opposing opinions on the influence on prognosis of immediate breast reconstruction.¹⁾ Many researchers²⁻⁷⁾ have reported that immediate breast reconstruction using a musculocutaneous (MC) flap, a MC-flap combined with prosthesis, or prosthesis alone did not affect the prognosis of the patient. Immediate breast reconstruction after mastectomy for cancer is now widely accepted. Among the several types of reconstruction, the latissimus dorsi (LD) flap is thought to

be inadequate to create ample volume for the breast, and has often been combined with a silicone prosthesis.^{3,4,6,8,9)} Since 1986, we have had the opportunity to perform breast reconstruction surgery immediately after modified radical mastectomy for breast cancer using the LD/MC-flap without a prosthesis. The very favorable cosmetic results of breast reconstruction using the LD/MC-flap alone are described in this report.

PATIENTS AND METHODS

1) Patients and disease profile

In our institute, after a diagnosis of breast cancer was confirmed by biopsy, all patients at less than Stage 2 were offered the following treatment options: (1) modified mastectomy; (2) modified mastectomy with immediate breast reconstruction; and (3) breast preserving operation. Patients with locally advanced disease were not offered the option of immediate breast reconstruction.

We performed immediate breast reconstruction surgery using the LD/MC-flap in 22 patients with breast cancer, ranging in age from 27 to 60 years, with a mean of 42.0 years. Ten patients had cancer in the right breast and 12 in the left. Location of the tumor was the upper-inner quadrant in 4, upper-outer in 10, lower-outer in 5, and central in 3 (Table 1).

Clinical stages for these 22 patients were Tis or T0 (noninvasive carcinoma or Paget's disease) in 4, Stage 1 in 14, and Stage 2 in 4. Auchincloss operation was performed in 11 patients, modified Auchincloss in 2, Auchincloss plus parasternal dissection in 4, and

Table 1. Tumor location

	Right breast (10)	Left breast (12)
UIQ ^a	2	2
LIQ ^b	0	0
UOQ ^c	6	4
LOQ ^d	1	4
CENT ^e	1	2

^aupper inner quadrant. ^blower inner quadrant.

^cupper outer quadrant. ^dlower inner quadrant.

^ecentral region.

modified Auchincloss plus parasternal dissection in 5.

2) Surgical procedures

a) Skin incision

The skin incision is designed as a circle, where the incision line is a distance of 2 or 3 cm from the outer edge of the tumor. Where any part of the nipple areolar complex falls within 3 cm of the tumor edge, the entire nipple areolar complex is incised as well. The incision is extended if necessary toward the axilla to make axillary nodal level 1 to 3 dissection easier. A thin skin flap is created about 3 or 4 cm from the incision line.

b) Ablative procedure

The term modified Auchincloss means that, to allow axillary dissection, the pectoralis minor muscle is cut 2 to 3 cm from its insertion on the coracoid process without resection of this muscle (Fig. 1). In most patients, except those with Tis or T0, all level 1, 2 and 3 lymph nodes were removed.

Preservation of the nipple areolar complex or the banking of one on the lower abdomen is performed if the distance between the edge of the nipple and the tumor is more than 3 cm. In such cases, we perform intraoperative histologic examination by frozen section to confirm the absence of any cancer cell invasion. If an invasion is present, neither preservation nor banking of the nipple areolar complex is performed.

We do not resect the fat tissue of the mammary gland beyond the inframammary fold line, in order to perform symmetrical breast reconstruction.

Our present criteria for parasternal lymphadenectomy are for patients with a breast cancer tumor larger than 1.1 cm in diameter located in the medial half of the breast, and for patients with a tumor larger than 2.1 cm located in the lateral half of the breast. After modified mastectomy, detachment of the parasternal pectoralis major muscle from the 1st cartilage to the 4th intercartilagenal space and exci-

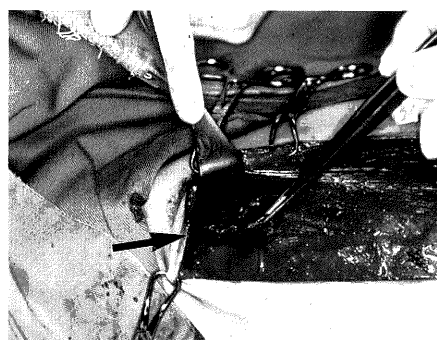


Fig. 1. The pectoralis minor muscle is cut (arrow) 2 to 3 cm from its insertion without resection of this muscle.

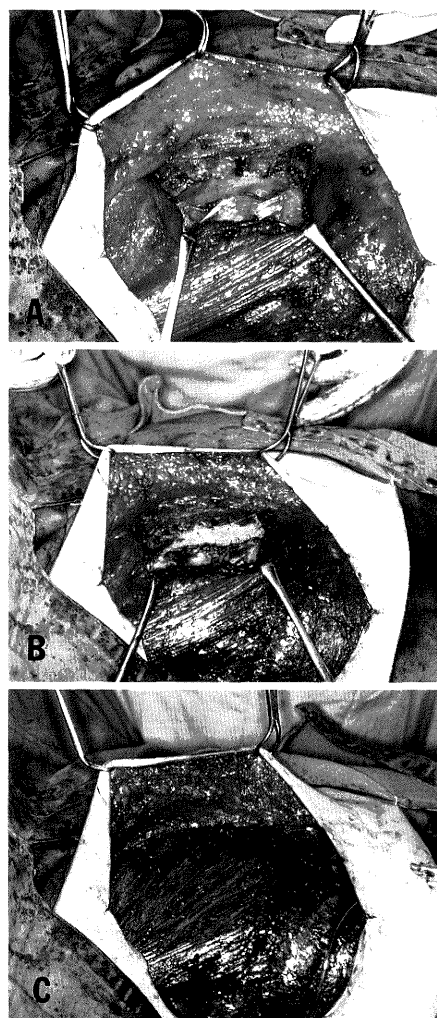


Fig. 2 A. The extrapleural parasternal lymphadenectomy being performed. B. The defect is covered by a double-layered Marlex mesh. C. The detached muscle is sutured.

sion of the intercostal muscle and the 2nd to fourth costal cartilages are performed. After the extrapleural parasternal lymphadenectomy is performed (Fig. 2A), the defect is covered by a double-layered rectangular Marlex mesh which is sutured to the sternum, rib and intercostal muscles (Fig. 2B). The detached muscle is then sutured together (Fig. 2C).

c) Immediate Reconstruction

To create a symmetrical breast, it is very important to make an exact skin design preoperatively on the breast and back for a LD/MC-flap which fits the mastetomized wound (Fig. 3). We outline a skin island over the latissimus dorsi either transversely or obliquely in accordance with the condition of the recipient site, which is determined by the location and size of the tumor. After the ablative operation is completed with the patient in the supine position, the patient is placed in the lateral position to take a LD/MC-flap. To obtain an ample LD/MC-flap, we take as much muscle and subcutaneous fat tissue as possible. The

latissimus dorsi muscle is not cut at the point of insertion. After transfer of the flap, the back wound is closed and the patient is again situated in the supine position to perform breast reconstruction. To create a symmetrical contour and shape, we often hold the distal portion of the fat tissue and arrange the tissue with the patient in a half sitting position during skin fitting. After obtaining a satisfactory contour and shape, the edge of the flap is sutured to the pectoralis major at the upper, medial and lower parts and to the serratus anterior muscle laterally.

3) Histologic findings

Histologically, the 22 carcinomas in this study consisted of 18 invasive carcinomas, 2 noninvasive carcinomas, and 2 cases of Paget's disease. Invasive carcinomas were classified according to the Japan Mammary Cancer Society criteria¹⁰⁾ as follows: 5 papillotubular carcinomas, 10 solid tubular, 2 scirrhous and 1 tubular. Two patients were found to have a positive node on final histologic examination. One patient had a positive node at level 1, and another had a positive subclavicular lymph node.

4) Assessment of cosmetic results

To evaluate the cosmetic results in terms of patient satisfaction, a third person interviewed the patients 3 to 36 months after surgery. The average interval between surgery and interview was 11.5 months.

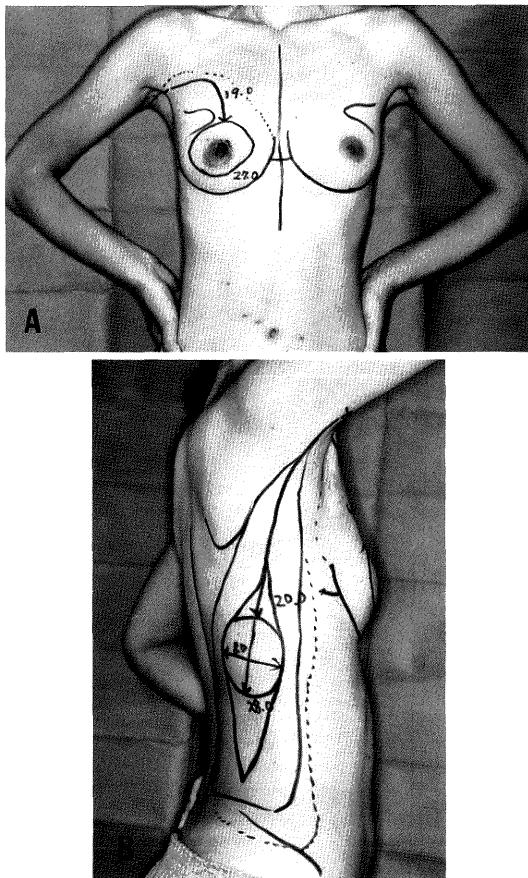


Fig. 3. One of the preoperative skin designs for both mastectomy (A) and LD/MC-flap (B).

RESULTS

1) Operating times

Modified mastectomy with immediate breast reconstruction required operation times ranging from 3 h and 45 min to 9 h and 40 min, with a mean time of 6 h 10 min.

2) Blood loss

Blood loss during the operation ranged from 200 to 1050 ml, with an average of 475 ml.

3) Donor scar on the back

Nine patients had an oblique and 13 patients had a transverse donor scar on the back.

4) Complications

There were no operative or hospital deaths nor life-threatening complications in this series of patients. Nine patients developed a seroma on the back, and 3 patients a hematoma in the axilla, but these resolved within short postoperative periods. Two of four patients who underwent nipple areolar complex preservation had temporary nipple erosion, and 1 patient had partial skin loss at the recipient site.

5) Cosmetic results (Figs. 4-7)

After surgery, the reconstructed breast showed a slight increase in volume for several days due to edema, but after this disappeared, the decrease in volume due to probable atrophy of muscles was

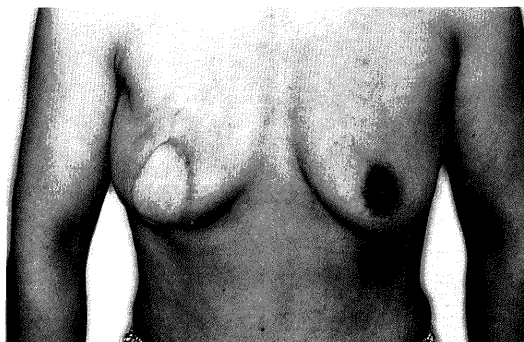


Fig. 4. Postoperative appearance 10 months following immediate reconstruction. A 46-year-old patient treated by the Auchincloss procedure. On third person interview, the patient indicated partial satisfaction with the cosmetic result.

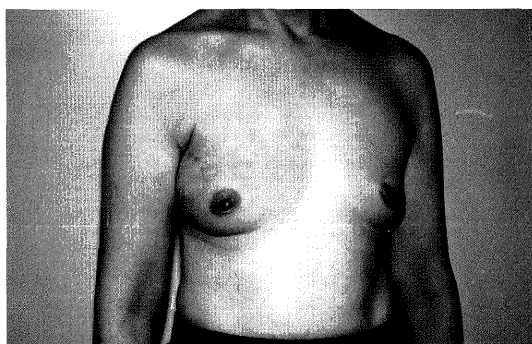


Fig. 5. Postoperative appearance 7 months following immediate reconstruction. A 58-year-old patient who underwent the Auchincloss procedure with preservation of the nipple areolar complex. On third person interview, the patient indicated partial satisfaction with the cosmetic result.

within the minimal range during the follow up period. According to third person interviews of 22 patients, 3 were fully satisfied, 18 were partly satisfied, and 1 was not satisfied, but none regretted having undergone the surgery.

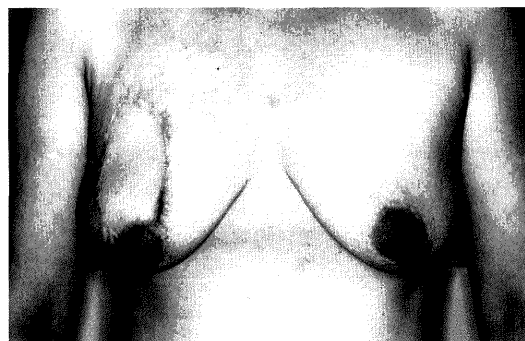


Fig. 6. Postoperative appearance 12 months following immediate reconstruction, with subsequent nipple areolar reconstruction. A 39-year-old patient underwent Auchincloss procedure with simultaneous banking of the nipple areolar complex on the lower abdomen. On third person interview the patient indicated partial satisfaction with the cosmetic result.

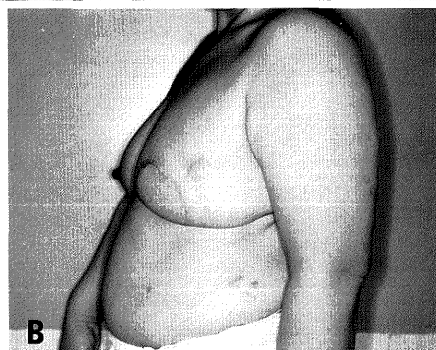
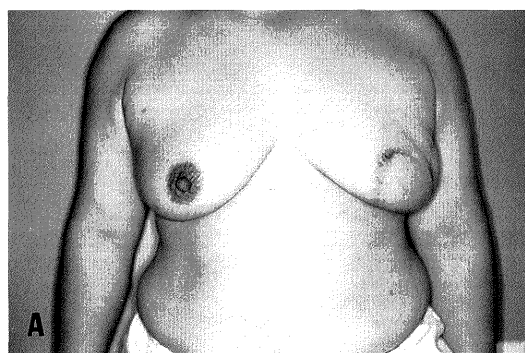


Fig. 7. Postoperative appearance 28 months following immediate reconstruction (**A.** front view, **B.** lateral view). A 40-year-old patient treated by Auchincloss procedure. On third person interview, the patient indicated complete satisfaction with the cosmetic result.

6) Recurrence

The follow up period ranged from 4 months to 72 months (between June 5, 1986 and June 30, 1992), with a median period of 38 months and a mean period of 38.6 months.

One patient died from distant metastases, lung and liver, with no local recurrence, 24 months after the operation.

DISCUSSION

In America and Europe, the main therapy used for early breast cancer is breast conservation,^{11,12)} with extremely good results being obtained. In Japan, research on breast preserving therapy is only now being initiated.^{13,14)} It is important to carefully evaluate therapy results that have been presented by researchers in many countries, including Japan, and proceed carefully with research on breast preserving therapy for Japanese patients with early breast cancer. Immediate reconstruction is another preferable operation for cosmesis. To reconstruct a good breast using a LD/MC-flap, it is necessary to perform a modified radical mastectomy. Until the 1980s, the problem of cancer therapy in Japan focused on whether the modified radical mastectomy was acceptable in comparison to the standard radical mastectomy. There now seems to be no question on this point.¹⁵⁾

We have three treatment options for stage 1 and some stage 2 breast cancer patients; namely, a modified radical mastectomy, modified radical mastectomy plus immediate breast reconstruction, and breast preserving therapy. We always inform the patient before the operation that she has breast cancer and then present the three options mentioned above. It is the patient, and not the surgeon, who always chooses one of the three options. In the patients who select immediate breast reconstruction, we perform breast reconstruction immediately following mastectomy.

Our reasons for primarily choosing the LD/MC-flap as reconstructive tissue depends upon: 1) the LD/MC-flap can maintain sufficient blood supply; and 2) a good reconstructed breast shape can be easily achieved. Even with a pendulous and/or large breast, we can achieve symmetric reconstruction without contralateral mammoplasty to match the reconstructed site. Until quite recently, it has been said that the LD/MC-flap is too small to reconstruct a substitute breast, especially in patients with large breasts. Many surgeons and plastic surgeons have recon-

structed a breast using the LD/MC-flap with prosthesis,^{3,4,6,8)} a rectus abdominis (RA) MC-flap with prosthesis,^{4,9)} a RA/MC-flap alone,^{3,4,9)} or a prosthesis alone.^{2-5,7,9)}

We conducted reconstruction using a LD/MC-flap alone, and achieved excellent cosmetic results. In the early period of our series, a few patients did not have sufficient volume, resulting in inadequate cosmesis. After improvement of surgical techniques, a sufficient volume of flap was obtained, and we have consequently achieved sufficient reconstructed breast volume. In order to obtain ample volume, as much muscle and subcutaneous fat tissue as possible is taken. It was shown that most Japanese women possess a sufficient LD/MC-flap for reconstruction of a mastectomized breast.

As for complications, while the incidence was relatively high, they were all minor and did not influence cosmetic results, as many researchers have reported.^{6,16)}

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