

Breast reconstruction following mastectomy

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Breast reconstruction following mastectomy is a feasible and viable option to help restore the body shape and image of a patient. There are multiple surgical procedures for the reconstruction of the female breast, including the use of a mammary saline prosthesis or various autogenous tissues with myocutaneous flaps. These different approaches, together with possible risks and complications, should be discussed with the patient before the mastectomy is performed. A consensual approach must be taken that best fits the patient's needs and expectations, either as an immediate reconstruction or as a delayed procedure, should the patient opt for reconstruction. Breast reconstruction is a common procedure in North America. As Hong Kong patients become better informed, the demand for breast reconstruction can be expected to increase.

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Introduction

Breast cancer recently replaced lung cancer as the most common cancer in Hong Kong women.^{1,2} The incidence of breast cancer approaches 40 per 100 000 population. The standard treatment for a large invasive carcinoma is often a modified radical mastectomy. The loss of a breast may have profound psychological effects on a woman. Following mastectomy, a woman may feel she is less than normal, having lost an important secondary sexual characteristic. This is especially true in younger women. This self-perception has an important bearing on normal daily social activities and functioning. Many women delay seeking medical attention when they first feel a lump in their breast because of the fear of possibly losing their breast and their femininity. The knowledge of possible breast reconstruction after mastectomy may encourage a woman to consult a doctor sooner, rather than later.

Breast reconstruction often enhances the quality of life of a breast cancer patient after mastectomy—both socially and psychologically.^{3,4} Reconstruction elimi-

nates the need for an external breast prosthesis, which can be cumbersome, and allows greater freedom in daily and sporting activities, and also gives greater freedom as to the style of clothing that can be worn.

Breast reconstruction has advanced considerably over the past 15 years with the adoption of the autogenous myocutaneous flap. The demand for breast reconstruction, or at least the knowledge of such procedures, has greatly increased in Hong Kong within recent years as medical information has become more readily available through the media. From May 1993 to December 1995, a total of 35 operations for breast reconstruction were performed at the Prince of Wales Hospital, Hong Kong. Saline breast implants were used in 19 of the reconstructive procedures. Latissimus dorsi myocutaneous flaps were used in six patients. Transverse rectus abdominus myocutaneous (TRAM) flaps were used in 10 patients.

Patients planning to have a mastectomy should be advised of the available methods for reconstruction of the breast, and that reconstruction can be carried out immediately or postponed. The decision whether or not to have an immediate breast reconstruction should be made by the patient with the assistance of a plastic surgeon before the mastectomy is performed. The decision to use a breast implant or autogenous tissues for breast reconstruction should also be made pre-operatively. The woman's body frame, the shape and volume of the contralateral breast, the availability of

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autogenous tissues, and the patient's desire for or against the use of an implant are the determining factors for such a decision.

For breast reconstruction with implants, the cost of the material, the number of follow up visits, and the time frame for post-operative inflation of the breast implant should be considered. Each breast implant costs approximately HK\$3000 to \$4000, depending on the manufacturer, the texture, and the option of volume adjustment after surgery. At the Prince of Wales Hospital, post-operative follow up visits do not incur additional cost to the patient. When autogenous myocutaneous flap is used for breast reconstruction, no adjustment is needed in the post-operative period. Follow up visits are basically for wound examination initially and for surveillance of recurrent cancer later.

Patient selection

Apart from the patient's age and general health status, her desire and motivation for breast reconstruction should be considered. Personal expectations should be ascertained, whether the patient simply wants to be comfortable in day wear, or wishes to be more active in sports without wearing an external prosthesis. The patient's body frame, stature, weight, height, bra size and cup size should all be documented for reference. Patients should be forewarned of future gross breast asymmetry, especially if the contralateral breast is large or markedly ptotic.

Not all patients are candidates for breast reconstruction. Prior medical history and surgical procedures are important factors in determining whether a patient is a candidate for reconstruction and, if so, what type. Alternative options should also be discussed with patients. Unrealistic expectations should not be conveyed to a patient and there should be no coercion to undergo a certain type of reconstruction.

Different reconstructions will suit different patients. Some patients may simply want a breast mound so that it is easier for them to dress. These patients may not be concerned about the reconstruction of the nipple-areolar complex, whereas other patients may want every possible procedure performed. They may even want a balancing procedure conducted on the contralateral breast to match the reconstructed breast in terms of symmetry in shape and volume.

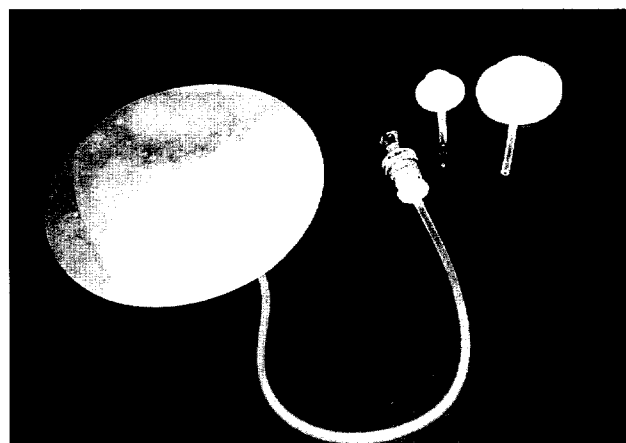


Fig 1. An adjustable saline-filled mammary prosthesis

Reconstruction methods

Breast reconstruction has evolved greatly since the introduction of mammary implants in the 1960s. The most common and simplest method of reconstructing the breast uses mammary implants.⁵ Until recently, silicon implants were used. However, because of the possible association of auto-immune disease with silicon, saline implants are used in most breast reconstruction operations. The newer implants are post-operatively volume adjustable (Fig 1). They are especially suitable when there is a deficiency of skin following mastectomy and it would be impossible to close the skin without tension over a fully inflated prosthesis.⁶ With the adjustable prosthesis, the use of tissue expander, and the weekly or twice-weekly inflation of the tissue expander in the post-operative period, subsequent exchange for a permanent prosthesis may be eliminated, hence avoiding a second major operation.

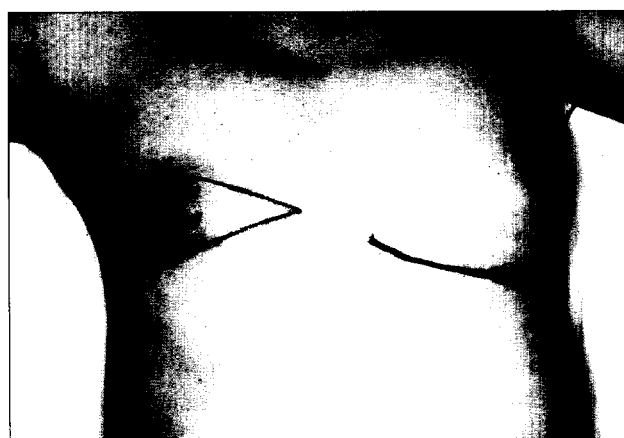


Fig 2. Patient undergoing total mastectomy and axillary dissection with immediate breast reconstruction using saline-filled mammary prosthesis



Fig 3. Post-operative appearance of the same patient with a saline mammary prosthesis inserted behind the pectoralis major muscle

Figures 2 and 3 show a young woman with breast cancer who had a modified radical mastectomy and immediate breast reconstruction by placement of an adjustable saline mammary prosthesis behind the pectoralis major muscle. Subsequent nipple-areola reconstruction was performed as a separate minor operation under local anaesthesia (Fig 4). This means that the patient is able to wear the same clothing as she did before the surgery (Fig 5).

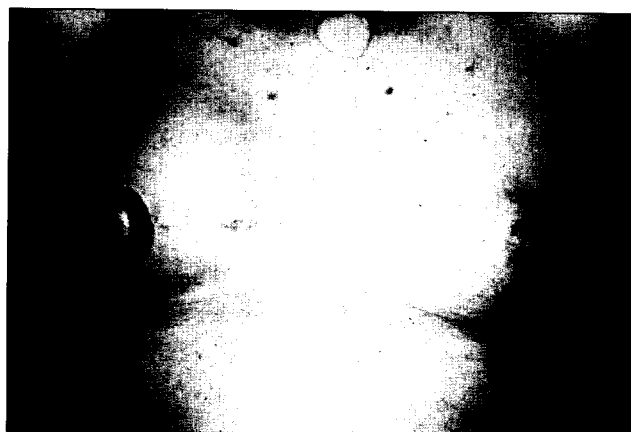


Fig 4. The same patient with nipple-areolar reconstruction performed two months after mastectomy

The most common complication of breast reconstruction with a breast implant is capsular contracture which may require closed capsulotomy, open capsulectomy, or implant removal. Implant deflation or leakage occurs rarely, and is an inherent complication of breast implants. There is no conclusive evidence that silicon prostheses impair the body's immune defenses or cause immunological diseases.⁷

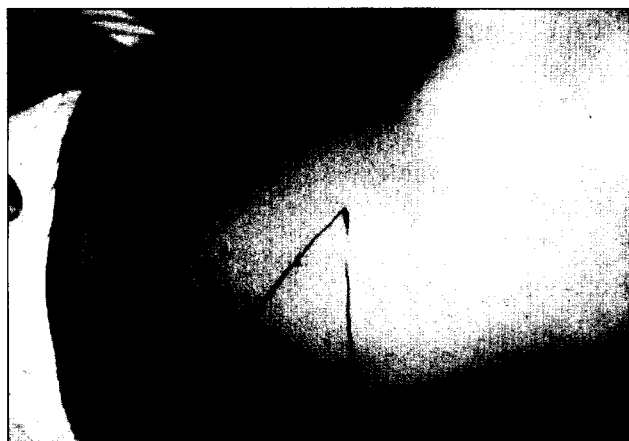
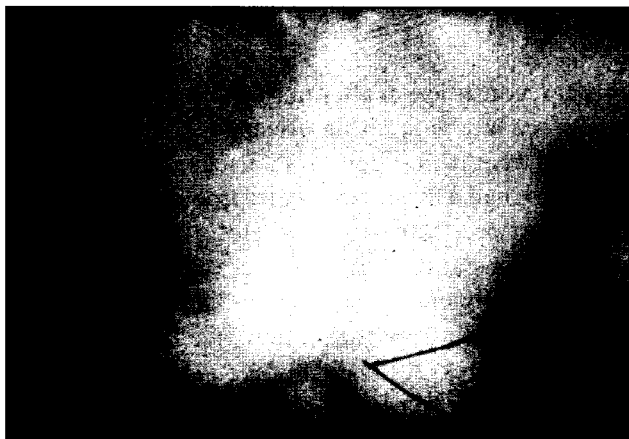
Myocutaneous flaps for breast reconstruction were introduced approximately 15 years ago. Before the advent of myocutaneous flaps, large local flaps were used with unpredictable results. Initially, a latissimus dorsi myocutaneous flap is supplemented with a mammary implant because there is not enough tissue volume to mimic a breast, especially when the contralateral breast is large.⁸ The flap is based on the thoraco-dorsal pedicle which must be preserved during the axillary dissection for advanced breast disease. Figures 6a and 6b show the design of a latissimus dorsi myocutaneous flap that was used to immediately reconstruct the left breast of a young woman who had had a mastectomy for breast cancer. Figure 7 shows the post-operative appearance of the same patient; there is good symmetry of the breasts. This same flap can also be used when there is a large chest wound to cover after mastectomy for advanced disease. The flap coverage is better than the older method of skin grafting because of the availability of more durable tissues, less deformity, and a better tolerance of post-operative radiation, if needed.



Fig 5. Breast reconstruction allows the patient to wear the same clothing as previously

Another flap that is often used is the TRAM flap.⁹ This procedure uses the lower abdominal tissues, including skin and subcutaneous tissues together with ipsilateral, contralateral or bilateral rectus muscles based on the superior epigastric vessels. A two-team approach is frequently used at the Prince of Wales Hospital to perform a modified radical mastectomy and simultaneously to raise the TRAM flap for immediate breast reconstruction. The post-operative appearance of a patient with immediate breast reconstruction by TRAM flap is shown in Fig 8.

The TRAM flap can also be used as a free flap based on the inferior epigastric vessels.^{10,11} Use of a super-



Figs 6a and 6b. Patient with left breast cancer prepared for mastectomy with immediate reconstruction by latissimus dorsi myocutaneous flap

charged TRAM flap has also been advocated by some surgeons to minimise the possibility of flap necrosis.¹²

This is when a single pedicle TRAM flap with an additional inferior epigastric vessel is microvascularily anastomosed to a thoracodorsal vessel or a branch of the axillary vessels. All types of TRAM flap reconstruction are more extensive procedures and have several potential problems. Partial or total flap necrosis and abdominal herniation at the donor site are possible complications of this reconstruction.¹³

Because the pedicled TRAM flap generally gives good results we do not use free TRAM flaps or the super-charged TRAM flap. Patients who are obese or who have had certain types of abdominal surgery are not candidates for TRAM flap reconstruction. A TRAM flap reconstruction is not contraindicated in women of child-bearing age and successful pregnancies after TRAM flap breast reconstruction have been reported.¹⁴



Fig 7. Appearance of patient in Figs 6a and 6b six months after surgery



Fig 8. After mastectomy, the left breast was immediately reconstructed using a transverse rectus abdominis myocutaneous flap

The gluteal tissues can also be used for breast reconstruction as a free myocutaneous flap by anastomosing the inferior gluteal vessels to the thoracodorsal vessels.¹⁵ Because of the donor site defect, it is not the first choice of myocutaneous flap for breast reconstruction.

It has been our routine practice to reconstruct the breast immediately following mastectomy, except in cases where the patient is uncertain of having the breast reconstruction done. When the TRAM flap is used for reconstruction, a two-team approach is often used.

The nipple-areolar complex can be reconstructed under local anaesthesia two months after breast reconstruction. Part of the contralateral nipple can be used as a free composite graft for nipple reconstruction. Plication of local tissue flaps is commonly used to reconstruct the nipple. For the areolar reconstruction, the

plastic surgeon should choose the flap reconstruction technique with which they feel most comfortable. Medical tattooing seems to be the most popular method currently because many high quality tattooing instruments and different pigment shades are available and the hue of the normal areola can be approximated. Tattooing also eliminates the defect at the skin graft donor site.

Asymmetry of the breasts after breast reconstruction is common. This is especially true in obese patients and multiparous patients. The asymmetry can be noted in volume, position, and shape. The natural breast usually becomes ptotic with ageing or pregnancies. In order to achieve symmetry of the breasts, several procedures can be performed. Mastopexy can be performed to correct ptosis of the contralateral breast. A mammary reduction may be needed to correct excess volume and ptosis of the breast. If the reconstructed breast is significantly bigger than the contralateral natural breast, augmentation mammoplasty should be considered for the natural breast. Correction of the contralateral breast can be conducted at the same time as the nipple-areolar complex reconstruction so that both nipple-areolar complexes are at the same level.

One of the major concerns for both patients and surgeons is the surveillance for cancer recurrence after breast reconstruction following mastectomy. Gel-filled silicone implants have been used since the 1960s for breast reconstruction. No significant increase in local recurrence or second breast cancers have been found.¹⁶ Long term follow up for breast cancer recurrence in patients with immediate breast reconstruction (using implants or myocutaneous flaps) has shown similar recurrence rates to breast cancer patients who have not had reconstruction. The detection and treatment of a recurrence is not delayed by the breast reconstruction.¹⁷

Since most breast cancer recurrences are noted in the residual skin of the chest wall following mastectomy, breast reconstruction using subpectoral implants does not interfere with post-operative cancer surveillance. Local recurrences of breast cancer also develop within the skin and subcutaneous tissues adjacent to the mastectomy and flap reconstruction site. Hence, myocutaneous flap reconstruction appears to be a safe procedure.¹⁸ Following breast reconstruction, however, the patient should be examined regularly by both the surgeon and oncologist, and periodic imaging studies performed.

Discussion

Breast reconstruction after mastectomy seems to be a safe procedure with no significant delay in the detection and treatment of recurrent disease. Most women who have had a mastectomy are probable candidates for breast reconstruction. In Hong Kong, women with breast cancer may not be aware of such an option. The primary care physician or the breast surgeon must inform the patient of such reconstruction procedures. A plastic surgeon should examine and talk to the patient before the mastectomy is performed if the patient is interested in knowing more about breast reconstruction. If possible, the patient could be introduced to patients who have had reconstruction and who may help her by discussing their personal experience. Although the choice of breast reconstruction belongs to the patient, this decision should be guided by a plastic surgeon.

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