

THE SIMULTANEOUS COMBINATION OF IMPLANTS AND TRAM FLAPS FOR AN AESTHETICALLY PLEASING BREAST

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In Taiwan, there have quite often been incidences when patients have had more abundant abdominal tissue to make a TRAM flap with a volume larger than the contralateral breast. In these situations, we usually recommend performing contralateral augmentation mammoplasty with a saline implant while undergoing TRAM flap reconstruction. From February 1997 to Mar 2001, 250 breast cancer patients underwent immediate pedicled TRAM flap reconstructions at Kaohsiung Medical University Hospital. Of these, 10 cases not only had TRAM flaps, but also simultaneous insertion of a prosthesis into the contralateral/bilateral breast to form a more pleasing breast mound. These were all saline implants. Each patient was young (aged 31-51 years) and had small to medium sized breasts. During the procedure, the implants were placed in a submuscular pocket formed by the pectoralis major muscle. There were no significant complications or failures. All breasts have remained soft and natural-looking during the follow-up period. Nine of 10 patients appreciated this procedure, and 8 of them would agree to convince other patients of the benefits of this operation. Using pedicled TRAM flaps and saline breast implants can achieve immediate breast reconstruction without the need for prolonged tissue expansion or an obvious back scar. Aesthetic results are excellent and the immediate use of an implant does not appear to pose a risk to the success of the pedicle transfer. It is a good alternative for breast cancer patients with previous hypoplasia of the breasts to achieve simultaneous therapeutic and cosmetic results.

Key words: TRAM flap, breast implants

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The transverse rectus abdominis myocutaneous (TRAM) flap has become the standard choice for breast reconstruction all over the world. Occasionally, some women have had large abdomens or slender habitus, but with relative hypoplasia of the breasts. Asymmetry after surgery has usually been the most disappointing result for these patients. For such cases,

immediate reconstruction using pedicled TRAM flaps and contralateral/bilateral breast implants may be a good alternative. We present our experience with the use of the pedicled TRAM flap in conjunction with implants in 10 patients.

MATERIALS AND METHODS

Between February 1997 and July 2001, 250 women underwent postmastectomy breast reconstructions at Kaohsiung Medical University Hospital. Of the reconstructions, 248 were immediate, 10 were bilateral, and all were performed using pedicled TRAM flaps. Preoperatively, each patient was evaluated as to whether she needed to receive si-

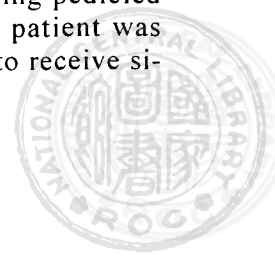
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multaneous insertion of mammoplasty implant into contralateral or bilateral sides. Ten patients (mean age, 35.4 years; range, 31-51 years) underwent immediate reconstruction using a combination of pedicled TRAM flaps and breast implants (Table 1). Each patient was highly motivated and was considered to be an ideal candidate for this type of reconstruction, because she desired immediate breast reconstruction, had a more protruding or slender abdomen, had relative hypoplasia of the breasts, was comfortable with the use of breast implants, and wished to receive augmentation mammoplasty.

There were 6 patients with contralateral saline breast implants and 4 with bilateral saline breast implants. The mastectomy technique was the same as the conventional method. After the pedicled TRAM flaps were harvested and transferred to the contralateral chest, we used the Archimedes principle and a self-made measuring device to calculate the volume needed to achieve aesthetic symmetry [1]. Then the implant was placed underneath the pectoralis major muscle for either contralateral or bilateral augmentation via contralateral axillary incision or ipsilateral mastectomy incision. Postoperative massage was the same as for the conventional augmentation. However, in bilateral implantation patients, it is suggested that massage of the flap side be performed one week later than on the healthy

side, due to the stabilization of the pedicle flow.

In the postoperative follow-up period, each patient was asked whether she would decide to receive the TRAM flap reconstruction if facing breast cancer again. Furthermore, they were asked whether they would encourage those patients with breast cancer to accept this reconstruction procedure. This questionnaire was conducted by a person who had no association with this operation.

RESULTS

In total, ten patients and 14 mammoplasty implantations were involved. The average age of the patients was 35.4 years. Hospital courses of all patients were uncomplicated. All of them had had infiltrating ductal carcinomas or intraductal carcinomas with no lymph node involvement. There were 7 smooth and 7 textured saline implants. Average final implant volume was 215.7 (150-280) cc. The postoperative massage was performed routinely. The average follow-up was 20 (6.5-43) months, during which time there were no episodes of flap compromise, partial flap loss, fat necrosis, or the development of capsular contracture. The reconstructed breasts have remained consistently symmetrical and soft during the follow-up time. All patients

Table 1. Implant data

No.	Age	Lesion	Implant	Volume(ml)	S/T	Cancer type
1	35	L	B	R 240 L 180	S	IDA
2	40	R	B	R 250 L 250	S	IDA
3	34	L	B	R 250 L 200	S	IA
4	39	R	L	150	T	IDA
5	51	L	R	240	T	IDA
6	31	L	B	R 190 L 150	T	IDA
7	32	R	L	160	T	IDA
8	38	L	R	270	T	IA
9	38	L	R	280	T	IA
10	36	L	R	210	S	IA

* IDA: Infiltrating ductal carcinoma * IA: Intraductal carcinoma * L: left, R: right, B: bilateral, S: smooth, T: textured

had soft, nonpalpable (Baker class I) capsules with no distortion of breast shape. Adjuvant therapy was not delayed in any patient. Patient satisfaction has been high (Figs. 1, 2).

According to our questionnaire, 9 of the patients were appreciative of this surgery and only one patient considered it "acceptable". Eight patients would convince other breast cancer victims of the advantages of TRAM reconstruction. One patient had no comment, and the other one thought she would not recommend this procedure to other patients.

DISCUSSION

The breast is an organ with varied volume, width, height, projection, tissue density, composition, shape, and position on the chest wall [2]. Symmetry is the key to aesthetic breast appearance. Perfect symmetry, however, rarely exists in nature and is even more of a rarity after breast surgery [3]. For a breast cancer patient, the most important means of maintaining symmetry is the correct restoration of the defect caused by the mastectomy lesion. The TRAM flap has replaced the prosthetic implant as the first choice for breast reconstruction, and ongoing refinements in TRAM flap techniques following mastectomy have improved the overall aesthetic results. The TRAM flap compensates for the mastectomy defect, but it does not easily fulfill the goal of perfect postoperative symmetry. In Taiwan, the breast sizes of women in their fourth decade are usually smaller than standard. Furthermore, we have quite often found incidences where the reconstructed volume of the TRAM flap was considerably larger than that of the normal breast, especially in those patients with protruding abdomens. Therefore, asymmetry of the breasts has been the biggest concern of the patients after the TRAM procedure.

Multiple strategies have been presented to deal with these reconstructive problems. To recreate volume, two TRAM flaps may be stacked to create more projection [4, 5]. However, this would increase the chance of donor site morbidity due to the sacrifice of the bilateral rectus muscle. An implant could be used alone, but this would make these reconstructive options difficult for those patients with a large skin defect secondary to mastectomy. Otherwise, a latissimus dorsi flap may be used in conjunction with implants [6]. However, latissimus dorsi flap reconstruction produces less ptosis when compared with the TRAM flap and implants. The additional soft-

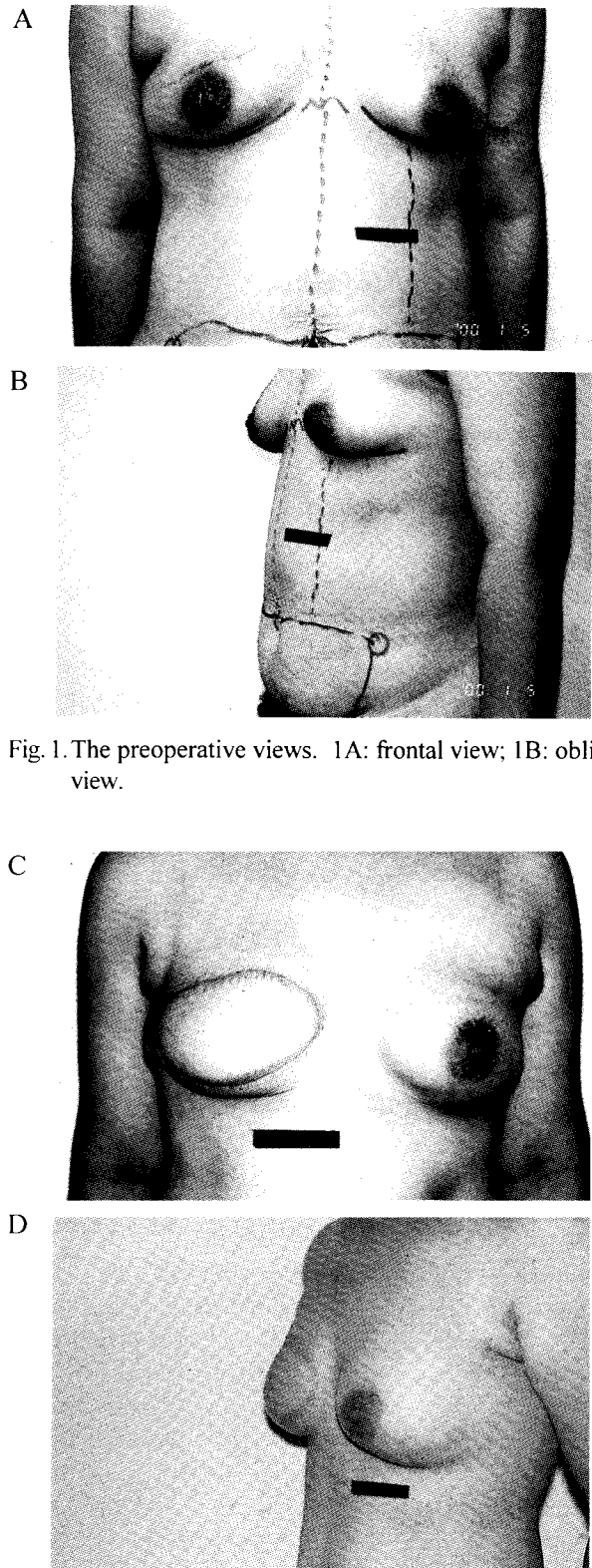


Fig. 1. The preoperative views. 1A: frontal view; 1B: oblique view.

Fig. 1. The postoperative views (3 months later). The TRAM flap on the right side and simultaneous insertion of mamoplasty implant into the contralaterally healthy breast. 1C: frontal view; 1D: oblique view.

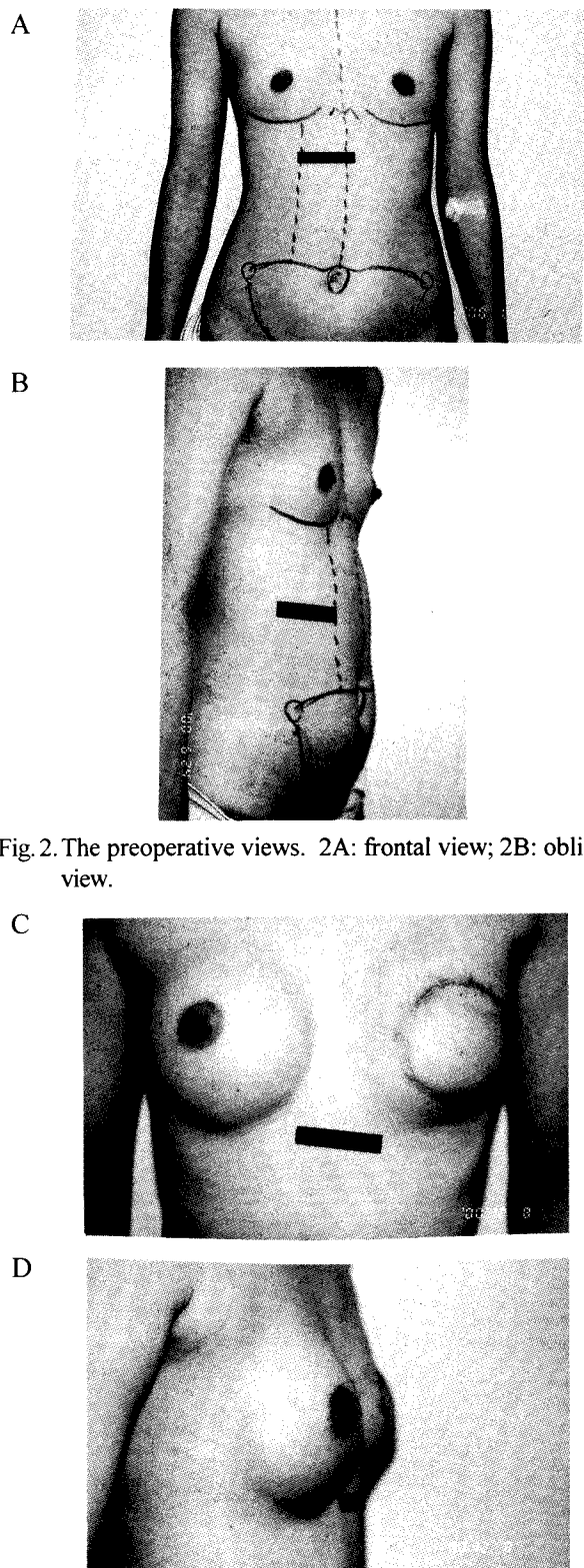


Fig. 2. The preoperative views. 2A: frontal view; 2B: oblique view.

Fig. 2. The postoperative views (6 months later). The TRAM flap on the left side and simultaneous insertion of mammoplasty implants into the bilateral breasts due to the flatten abdomen. 2C: frontal view; 2D: oblique view.

tissue supplied by the TRAM produces a supple breast that recreates more closely the feel of the natural breast in comparison with latissimus dorsi flap reconstructions.

Because the pedicle remains intact, the whole flap is one unit and could not be separated randomly. Pursuit of a more aesthetic appearance is the goal of plastic surgeons. Therefore, to achieve the aesthetically pleasing effect of bilateral symmetry of the breasts, it is usually recommended to insert the implants/expanders into the contralaterally smaller breast, rather than discarding the additional abdominal tissue. In the past, the use of a TRAM flap in conjunction with expanders has been suggested by Fisher *et al.* [7, 8]. The flap provides a soft and ptotic breast reconstruction, replaces skin coverage and results in acceptable symmetry with the additional benefit of a hidden scar.

The TRAM flap provides the additional benefit of masking implant ripples and edges, and it seems to resist the formation of periprosthetic encapsulation [9]. This technique also allows for the possibility of improving breast aesthetics in women with involutional changes of primary mammary hypoplasia. In addition, there may be added psychosocial benefits to the look and feel of the TRAM flap over implants alone [10].

In Taiwan, there have quite often been incidences where patients have had abundant abdominal tissue to make the TRAM flap's volume larger than the contralateral breast. Sometimes, the patients have had smaller breast sizes preoperatively. In these situations, we usually recommend performing contralateral augmentation mammoplasty with a saline implant while undergoing TRAM flap reconstruction to produce a more aesthetic appearance postoperatively. There are some advantages to this method. First, patients can obtain better symmetry and more beautiful breasts in one operation. There is no risk of vascular compromise, because there is no need of tailoring the flap. Furthermore, as was the case for four of our patients, they did not have sufficient abdominal tissue, but wanted simultaneous augmentation bilaterally. Therefore, we performed not only contralateral implantation, but also placed implants underneath the TRAM flap intraoperatively to achieve a more perfect mound. The latter procedure is particularly good for women who have insufficient autologous tissue in the lower abdomen to yield aesthetic reconstructive results. Those patients having a slender body build usually require bilateral breast reconstruction.

Breast reconstruction using a combination of surgical flaps and breast implants is, of course, not a new idea. Latissimus dorsi breast reconstruction has long been based on the concept of combining a soft tissue flap for added skin and soft tissue coverage with breast prosthesis for volume. However, there is one technical point which warrants emphasis. The vascular pedicle must be protected from contact with the prosthesis, and from excessive tension during inflation of the prosthesis. This may be accomplished by transferring the flap to the contralateral chest and placing the implant beneath the pectoralis major muscle so that direct contact between the flap and implant can be avoided. That is to say, the best way to insert the implant is on the submuscular plane, rather than the subglandular plane.

The ideal breast implant for this technique is an adjustable, single-chambered saline prosthesis. An adjustable implant allows greater control over the final volume, facilitating "fine-tuning" of the reconstructed breast. The implant can be inserted and positioned with minimal volume and, after the tissues are closed, the implant can be inflated to the desired volume. The full volume of saline can be injected at the time of surgery, or the filling port can be left in place and the injections continued later if immediate full inflation causes unacceptable tension on the flap.

Possible complications of this procedure include capsular contracture, infection, hematoma, and implant deflation or extrusion [11]. Extrusion occurs when the implant moves to a new position outside of the pocket where it was originally placed. In our series, there were none of the above-mentioned complications. The main disadvantages of this procedure include the requirements for an additional operative procedure and the use of nonautogenous (e.g., saline-filled) implant material.

In the follow-up period, all patients answered the same questionnaire. One patient stated that this method was only "acceptable". She thought it was not worthwhile to obtain the reconstructive result, because she needed to expend more patience and care on the healing of the wound in comparison with the conventional mastectomy procedure. Therefore, she would not like to promote this reconstruction method to others. Furthermore, another patient appreciated the combination of methods in one surgery, but had no comment about recommending this method. She thought that it "depended". Overall, the patients' satisfaction has been high, up to 90 percent (9/10), and most patients (8/10) would promote this combination reconstruction to those who needed

it. Therefore, it is a satisfactory alternative for slender patients undertaking immediate bilateral breast reconstruction.

The TRAM flap has been designed to replace the implant for reconstruction of the mastectomy defect. In a few cases, however, the TRAM flap in combination with implants provides an additional alternative in postmastectomy reconstruction, especially for very slender women. The decision to use the combination of implants and TRAM flap is multifactorial and includes: (1) a request for contralateral augmentation, (2) a protruding abdomen with relative hypoplasia of breasts, (3) a large skin defect secondary to mastectomy, (4) a thin abdomen with large ptotic breasts, and (5) the hidden scar compared with the latissimus dorsi flap. Finally, there are a variety of combination choices for aesthetic breast mounds, which depends on the ratio of patient's abdomen to breast, or the desire for augmentation mammoplasty.

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利用橫向腹直肌肌皮瓣以及人工義乳的合併運用來重建乳房

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利用橫向腹直肌肌皮瓣重建乳房手術一直是乳癌切除後的首選術式。但在台灣，多數乳癌患者的腹部組織比起其本身乳房組織要大許多。除此之外，另外有部分的乳癌患者，其腹部皮瓣的組織與乳房體積都不足以塑造一對美感的乳房；在此情況之下，吾人建議在術中，同時在對側或兩側植入一個義乳來取得均衡美感。高雄醫學大學在 1997 年 2 月到 2000 年 3 月，

完成了 250 例乳房重建手術，其中有 10 位患者接受術中同時植入義乳的建議。這 10 位患者並沒有任何併發症，其中尚有 9 位相當滿意此種作法，有 8 位會將此種術式推薦給其他病友。所以利用橫向腹直肌肌皮瓣與人工義乳的合併運用，能夠提供乳癌患者一個更趨於美感的乳房重建。

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