

A Case of Breast Reconstruction with Bilaterally Divided Transverse Rectus Abdominis Musculocutaneous Flaps after Removal of Injected Silicone and Granuloma

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Abstract

We present a case of breast reconstruction using bilaterally divided transverse rectus abdominis musculocutaneous flaps after the removal of severe siliconoma. In Japan, we have examined many patients who have had foreign substance injected into the breasts for augmentation. Most of these patients have had delayed complications. We believe that autologous tissue transfer is an ideal procedure for breast reaugmentation in patients who want to have artificial materials removed from the breasts but to maintain breast contour. (J Nippon Med Sch 2012; 79: 223-227)

Key words: breast reconstruction, transverse rectus abdominis musculocutaneous flap, silicone, complication

In the 1960s and 1970s, breast augmentation with a nonabsorbable artificial materials, particularly silicone gel, was popular in Japan¹. However, this material was later found to induce severe complications. As a result, most patients who underwent breast augmentation with silicone gel at that time still have delayed complications, such as multiple indurations, migration of silicone, breast deformity due to granuloma, and oily infiltration of the skin. In our department, we have treated many patients who have had complications after breast augmentation with injected nonabsorbable material²⁻⁴. Most patients want to reconstruct their breasts with autologous tissue after mastectomy because they are wary of artificial materials. In this paper, we report a case of breast reconstruction

using bilaterally divided transverse rectus abdominis musculocutaneous (TRAM) flaps after removal of injected silicone and granuloma, which is called siliconoma.

Case Report

A 50-year-old woman had received injections of liquid silicone for augmentation of both breasts in a cosmetic surgery clinic 28 years earlier because of mastatrophly after breastfeeding. She visited our hospital after a long period of worry, complaining of tumorlike lesions in both breasts and redness of the skin over the left inframammary lesion (**Fig. 1**). On her first visit to our institution, her breasts were clearly asymmetrical and deformed, and the injected

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Fig. 1 Preoperative clinical view shows clearly asymmetrical and deformed breasts and redness in the left inframammary fold.

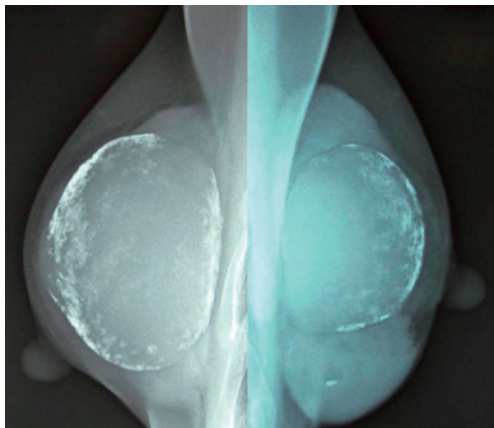


Fig. 2 Preoperative mammography shows large areas of opacity in both breasts.

material had spread over the mammary glands and caused skin contracture and redness. Mammography showed large masses in both breasts (**Fig. 2**). She also worried about the possibility of breast cancer and hoped to remove the injected material. Computed tomography revealed a solitary mass with eggshell-like calcification, and T1-weighted and T2-weighted magnetic resonance imaging showed hypointense and isointense signals. These imaging studies did not show evidence of breast cancer. At this point, she did not request breast reconstruction.

An operation to remove the siliconoma was performed under general anesthesia. Skin incisions were made along inframammary folds. Subsequently, the injected silicone and the surrounding granuloma were removed with meticulous electrocautery (**Fig. 3**). We did not resect the reddened skin of the left



Fig. 3 Siliconoma was extirpated with surrounding breast and subcutaneous tissue.

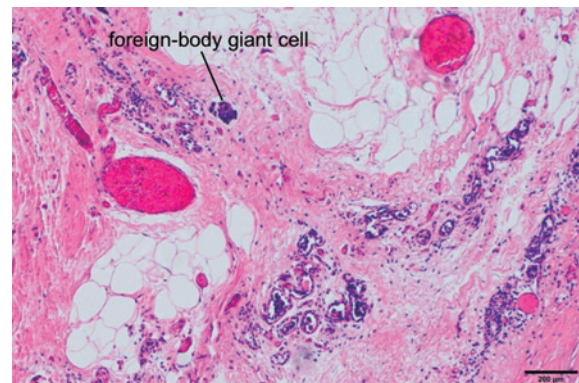


Fig. 4 Histological evaluation shows round to oval vacuoles of varying size surrounded by histiocytes and multinucleate giant cells.

breast because of the risk of severe postoperative contour deformity. A part of the granuloma under the reddened skin was left so as not to damage the vascularity of the overlying skin, and the remaining part was completely excised. Pathological examination showed collections of rounded vacuoles of varying size along with macrophages and foreign-body giant cells (**Fig. 4**). There was no evidence of malignancy or atypical cellular change in the stromal tissue or in the ductal epithelial components.

Because the patient hoped to undergo breast

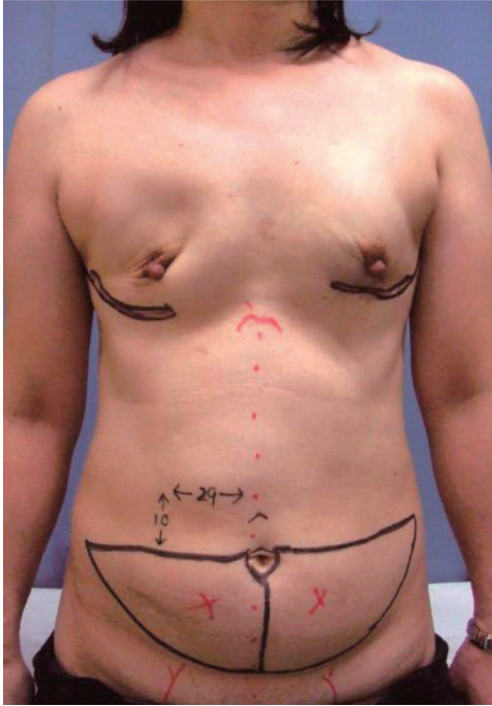


Fig. 5 Preoperative view of bilaterally divided TRAM flaps



Fig. 7 Six-month postoperative view

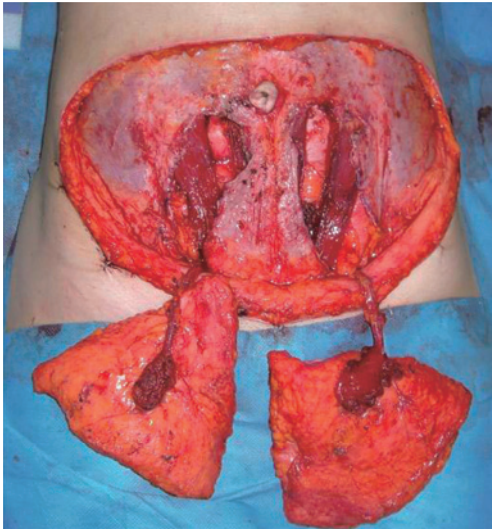


Fig. 6 Elevated bilateral free TRAM flaps

reconstruction, a second operation, bilaterally divided TRAM flap transfer, was planned 6 months after the first operation (**Fig. 5**). This operation was performed with a 2-team approach. One team performed the axillary dissection to identify the thoracodorsal arteries and venae comitantes to be used as recipient vessels for microvascular anastomosis when the free flaps were transferred. The other team harvested the bilaterally divided

TRAM flaps. When the free flaps were elevated, only the middle third of the belly of the rectus abdominis muscle and the overlying fascia were attached to the flap (**Fig. 6**). Then, the abdominal wall could be closed easily without using any artificial material to prevent abdominal wall herniation. In this case, because skin reconstruction was not required, the divided TRAM flaps were deepithelialized and transposed as dermal-fat flaps. The flaps were then trimmed to fit the shape of the pockets. The deepithelialized TRAM flaps were then carefully transferred into the previously dissected subglandular pockets and anastomosed with the thoracodorsal arteries and veins bilaterally. After the flaps were inset into the subcutaneous pockets, suction drains were installed subcutaneously on both the breast and abdomen sides. Postoperative physical examination of the flaps did not show fat necrosis. The patient was satisfied with the results of breast reconstruction and with the abdominal contour at the time of the latest follow-up consultation (**Fig. 7**).

Discussion

Breast augmentation with liquid silicone injection gained popularity at the end of World War II and

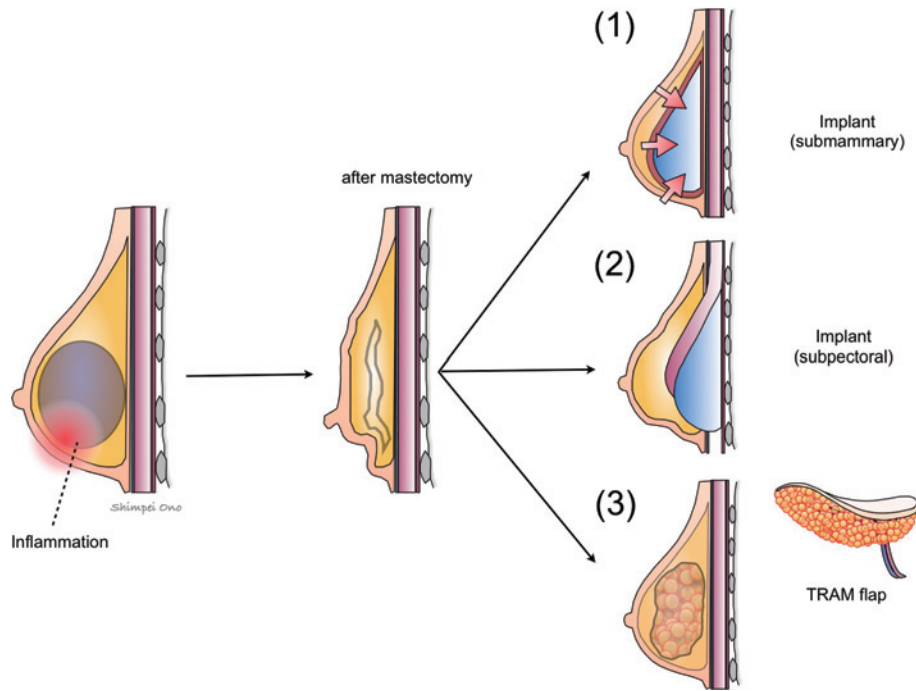


Fig. 8 The treatment for advanced silicone granuloma is usually radical subcutaneous mastectomy. The 3 reconstructive options after mastectomy are: (1) submammary implant, (2) subpectoral implant, and (3) autologous tissue transfer.

became increasingly popular in the 1960s and 1970s with physicians and sometimes unqualified practitioners in Japan¹. Many severe complications were later reported and have led to both medical and social problems¹⁵. These complications include foreign-body reactions, nodule formation, ulcerations, chronic cellulitis, and distant migration of the material. There are 2 main types of clinical presentation after breasts augmentation with liquid silicone⁶. The first presentation is multiple painful lumps in the breasts without skin involvement. The second presentation is skin involvement and inflammatory reactions due to silicone invasion of the overlying skin or granuloma formation or both.

Breast siliconoma with smaller lumps and limited skin inflammation can be treated with localized resection or steroid injection or both. On the other hand, with more extensive involvement, such as large lumps, a wide area of skin inflammation, skin ulceration, and fistula formation, more extensive surgery is necessary to fully excise these areas. The treatment for advanced silicone granuloma is usually radical subcutaneous mastectomy with or without overlying skin resection^{1,4,7}.

Some patients want to maintain the shape and size of their breasts with another surgical procedure because the aesthetic result of radical mastectomy usually falls short of the surgeons' hopes and the patients' expectations. After mastectomy, breast reconstruction remains challenging for plastic surgeons, and several reconstructive options have been reported (**Fig. 8**). The most common reconstructive method is bag prosthesis augmentation⁸. At present, augmentation with prosthetic implants is the safest and most effective way to improve breast shape and size. However, the most significant problem after reconstruction with prosthetic implants in this situation is severe capsular contracture, owing to the lack of subcutaneous tissue^{8,9}. Therefore, Megumi¹⁰ and Chen¹¹ have reported the usefulness of subpectoral breast implant augmentation after subcutaneous mastectomy. Indeed the risk of capsular contracture can be reduced with this method, but correcting the severe mammary deformity after mastectomy is still difficult because the implant is inserted into the subpectoral layer. Furthermore, choosing this treatment option is difficult if simultaneous skin

reconstruction is required and if the pectoral muscle has been invaded by granuloma. Additionally, patients with complications after silicone injection usually cannot easily accept using additional artificial implants. Therefore, some authors have recommended autologous tissue transfer for implant-intolerant patients and patients who have undergone mastectomy after complications from silicone injections^{3,4,12-16}. For breast reconstruction with autogenous tissue, the TRAM flap is widely accepted as the "gold standard." Although both free and pedicled TRAM flaps can be selected, the decision of which flap to use depends on the condition of the recipient vessels, because chronic inflammatory reactions to the artificial materials sometimes spread to the axilla, which can have a significant effect on free tissue transfer. If either flap can be selected, we prefer a free TRAM flap because the distortion or obstruction of the pedicle can be avoided, and positioning the flap is much easier. Free TRAM flaps also sacrifice less abdominal muscle than do pedicled TRAM flaps and carry a smaller risk of ventral hernia when they are harvested as muscle-sparing flaps.

Although transfer of bilaterally divided TRAM flaps is a major procedure with significant possible complications, we believe that autologous tissue transfer is an ideal procedure for breast augmentation in patients who want to have artificial materials removed from their breasts and to maintain breast contour.

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