

# Chapter 37

## FAT GRAFTING FOR BREAST AUGMENTATION IN ASIANS

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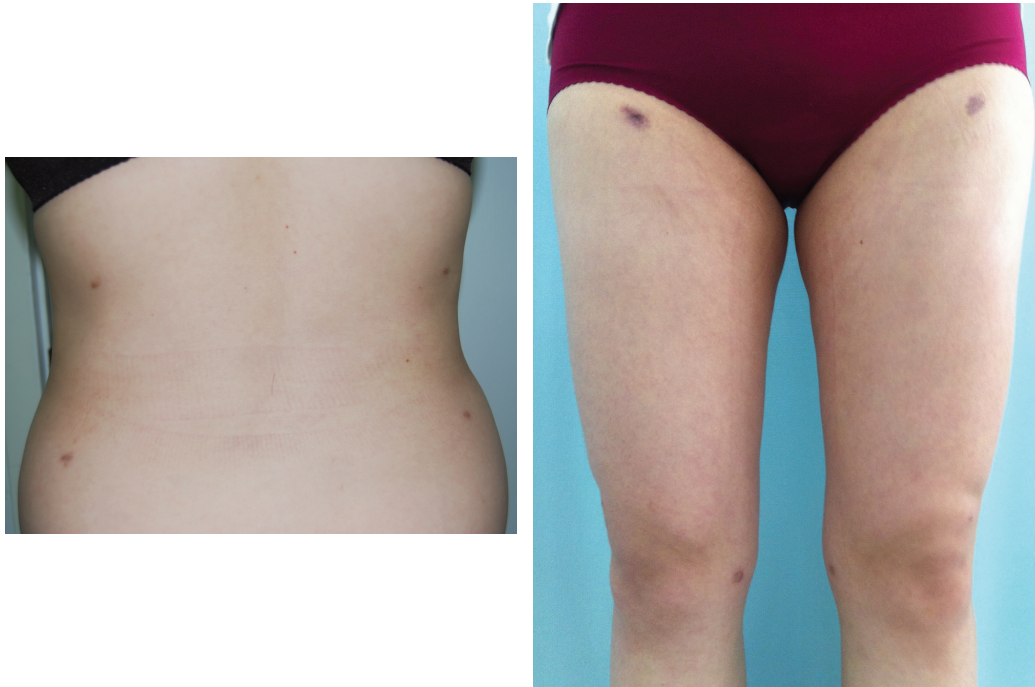
The number of patients requesting breast augmentation is increasing steadily in Asia, especially in China. Although breast augmentation with an implant remains the most popular cosmetic breast surgery, a significant percentage of patients in Asia refuse this operation because they worry about foreign materials in their body. Moreover, the use of a breast implant is also associated with an increased risk of certain surgical complications and both early (infection and incision separation) and delayed adverse effects (capsular contracture, silicone leaks, and scar formation).

Because they did not want postoperative incisional scars or a less natural shape and feel after augmentation with implants, some patients turned to augmentation with injectable materials. An estimated 500,000 patients underwent breast augmentation with injections of polyacrylamide hydrogel (Amazing Gel). However, clinical use of Amazing Gel has been prohibited by the Chinese government since April 2006, and some countries prohibit its use in the breast. It was found that this material could cause severe complications, including breast tissue necrosis and chronic pectoralis inflammation induced by its infiltration.

In recent years, good to excellent outcomes have been achieved with fat grafting for breast augmentation by many plastic surgeons worldwide. This technique has been found to create long-lasting enhancement of breast size, shape, and texture. Zheng et al, Illouz and Sterodimas, Coleman and Saboeiro, and other authors have reported that fat grafting is an effective method for breast augmentation or reshaping. Most Asian women do not want an excessive increase in their breast volume, but rather desire a natural, moderate result. Therefore breast augmentation with fat grafting, which combines body sculpture and augmentation of small-sized breasts, may be the best option for many Asian women. In this chapter, we present our unique experience of fat grafting for breast augmentation in Asians, including special considerations, indications, preferred surgical techniques, and clinical outcomes.

## *Material and Methods*

### SPECIAL CONSIDERATIONS



**Fig. 37-1**

Scarring can be a serious problem that limits a patient's clothing choices if the incisions for liposuction are not placed in areas that will be hidden by clothes. In this patient, the scars in her back and thighs are still visible 2 years after a fat grafting procedure.

Asian women have special characteristics that need to be considered when a surgeon performs fat grafting for breast augmentation. These patients are usually thin and small, with proportionally smaller breasts. The area to be liposuctioned should be large enough to provide adequate fat to ensure an obvious increase in breast volume. Therefore circumferential liposuction of the trunk or thigh is often required. As stated, because of possible poor scar formation, incisions for liposuction and fat grafting need to be placed in the hidden areas. Asian women are more likely to form hypertrophic scars than Caucasian women.

### INDICATIONS

Fat grafting is more appropriate for women who desire only moderate breast augmentation or those who simply want to restore their previous shape of the breast after weight loss, pregnancy, breastfeeding, ptotic breasts as a result of aging, tuberous breast deformity, severe asymmetry, or simply implant-to-fat conversion. Fat grafting is also recommended for women who wish to obtain more natural results with no sense of a foreign body in their breasts.

It is prudent to consider baseline breast mammography, ultrasound, and MRI evaluation before lipoinjection.

## DONOR SITE SELECTION AND PREOPERATIVE MARKING



*Fig. 37-2*

Areas for liposuction and fat grafting to the breast are marked with the patients in the upright position. Typical areas for liposuction include the abdomen, flanks, trochanteric region, inner thigh, the medial aspect of the knees, and the upper arms, depending on the patient's natural body fat distribution.

No clear correlation has been shown between the donor site location and the longevity of the implanted fat; thus the donor site can be selected based on identification of the region with sufficient adipose tissue or even on the patient's preference. We prefer to perform circumferential abdomen liposuction at the first session of fat grafting and circumferential liposuction of the thighs if there is a second session.

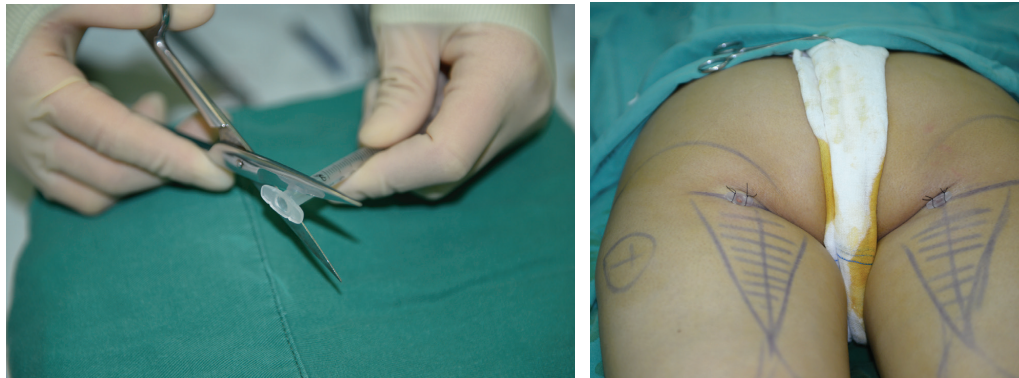
For circumferential abdominal liposuction, entrance incisions are needed for liposuction of the anterior abdomen and flank; one is placed in the pubic hairline, another in the umbilicus, and the third in the intergluteal fold for liposuction of the flank in the prone position. For circumferential thigh liposuction, two 0.4 cm incisions are placed near the pubic hair above the inguinal fold for liposuction of the anterior aspect of the thigh, and two incisions are placed in the infragluteal fold (in the perpendicular line from the tubercle of the ischium) for liposuction of the posterior aspect of the thigh.

## ANESTHESIA

Because significant quantities of fat are required for breast augmentation, the liposuction area usually needs to be large, so we perform the procedure with the patient under intravenous sedation through the tumescent technique.

## INCISIONS FOR FAT HARVESTING

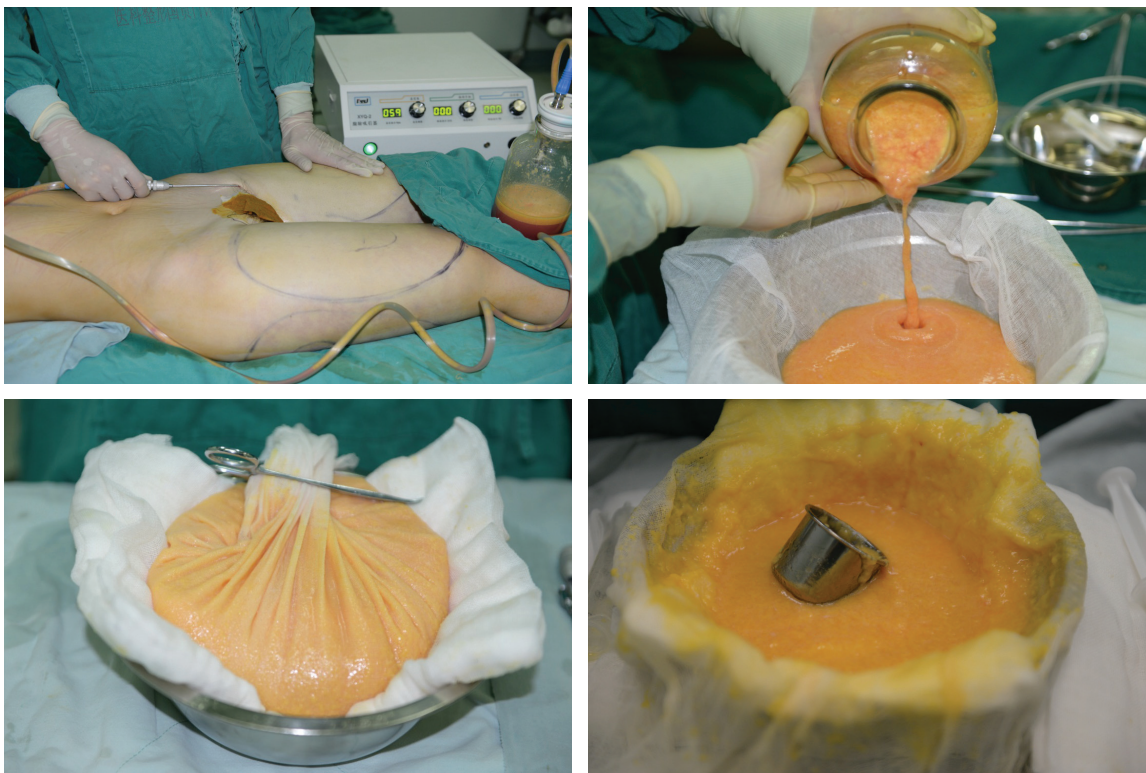
Incisions are made in the donor sites using a No. 11 blade. For abdominal fat harvesting, two incisions are made: one in the middle of the pubic hairline and one in the umbilicus. For harvesting of fat from the thighs, an incision is made in each subgluteal fold for liposuction of the posterior area, and an additional incision is made near the pubic hair above the inguinal fold for liposuction of the anterior area of the thigh and medial area of the knee. If there are any previous scars in the donor sites, they certainly can be used as the incision sites.



**Fig. 37-3**

To prevent skin abrasion at the incision, before liposuction a skin protector made from a 1 cc syringe is inserted into the incision and secured with sutures.

## HARVESTING AND PROCESSING

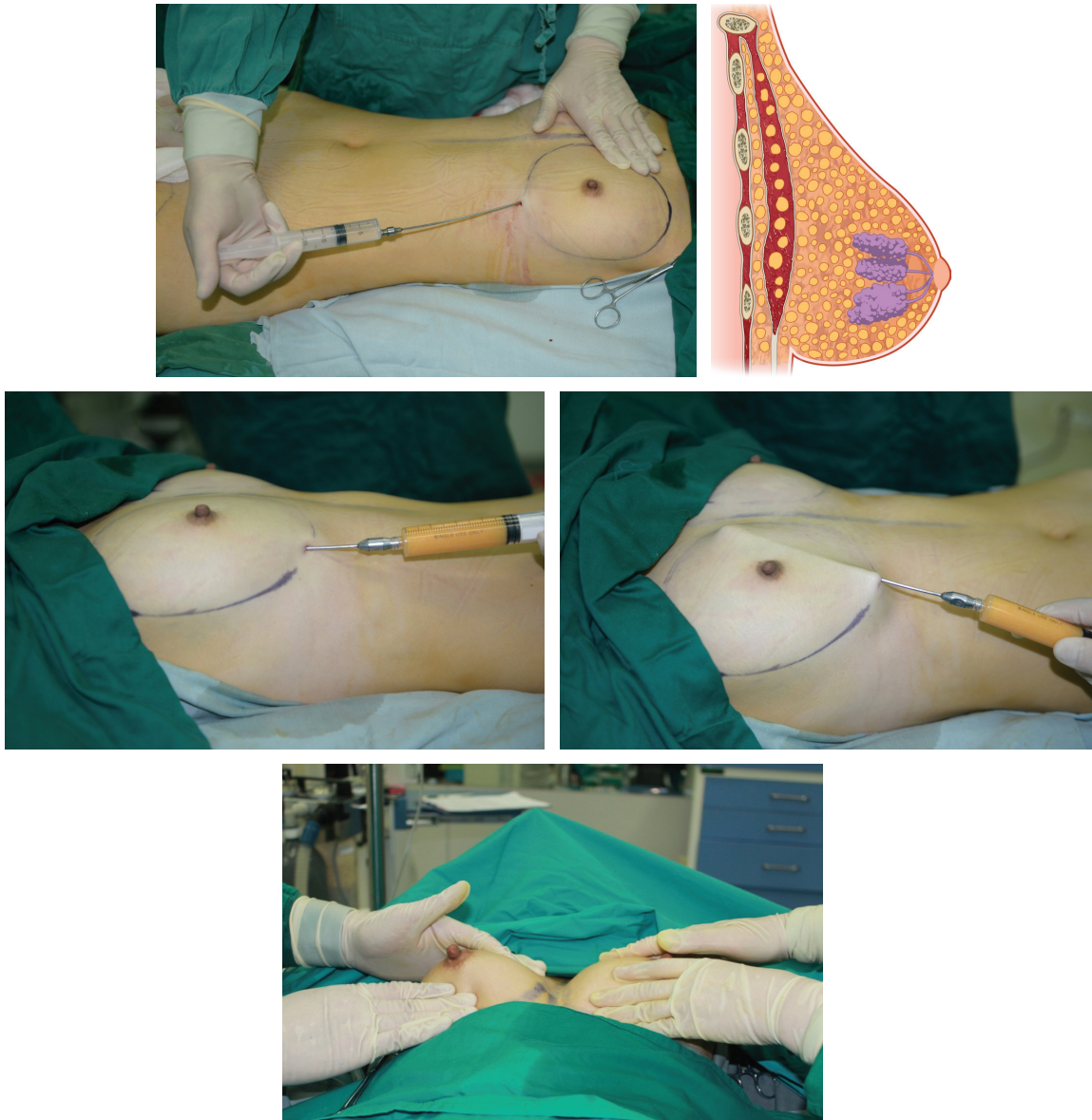


**Fig. 37-4**

After intravenous sedation has been administered, the harvest sites are infiltrated with tumescent solution (20 ml of 2% lidocaine with epinephrine, 1:100,000/L of normal saline solution). The fat is aspirated using a three-holed blunt cannula (with a 2.5 to 3 mm inner diameter) connected to a suction machine with low negative pressure ( $-400$  mm Hg). The processing procedure we use to prepare fat for injection is

similar to the method described by Kuran and Tumerdem. The surgery is performed under intravenous sedation, so no sodium bicarbonate is used as a buffer to alleviate injection pain during the infusion of the tumescent solution. All aspirated fat is rinsed one or two times with 4° C cool normal saline solution to remove blood, lidocaine, and extracellular oil. It is then collected within a sterile container lined with a single layer of cotton gauze. After filtering, the washed lipoaspirate packed in the gauze is left to dry on a cotton pad, which is changed with a dry one every 5 minutes, until it reaches a semisolid state.

## FAT GRAFT PLACEMENT



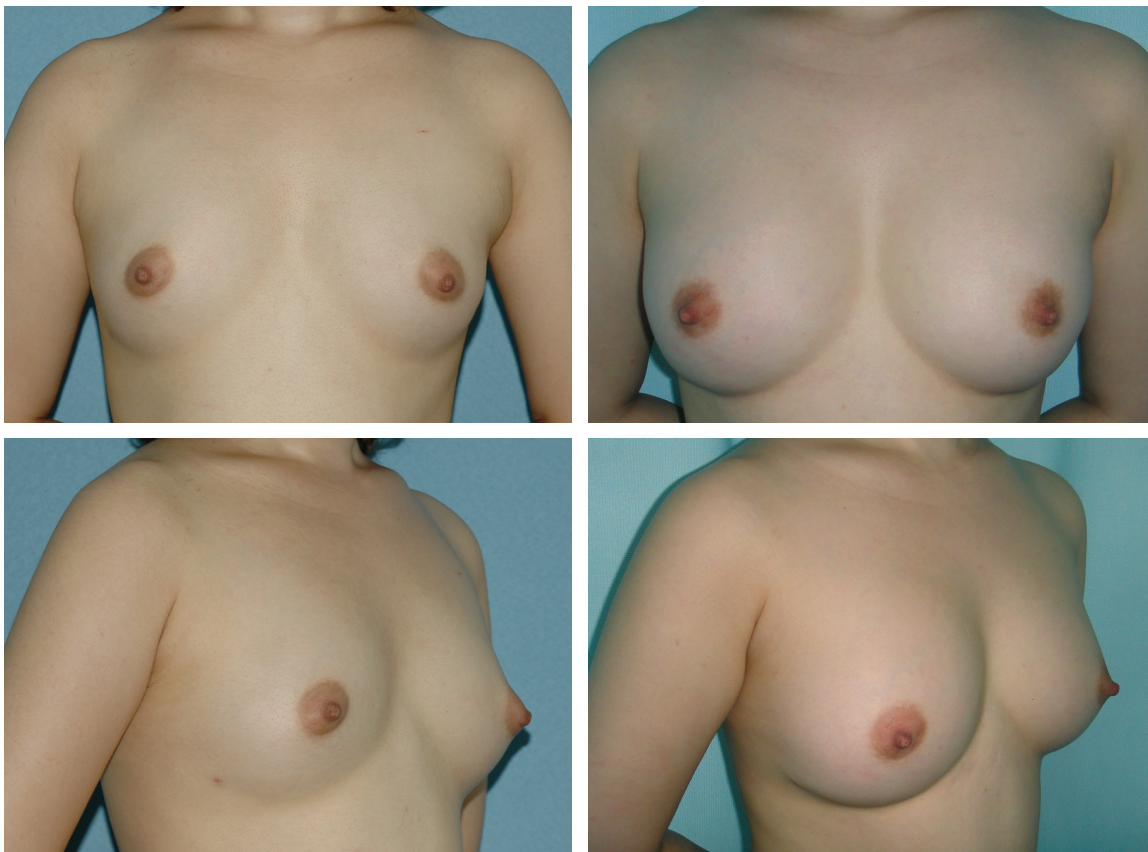
**Fig. 37-5**

A tiny incision is made at the lateral region of the inframammary fold, and 120 ml of tumescent solution is infiltrated into the submuscular and subcutaneous plane of each breast. Infiltration of tumescent solution into the breast can significantly reduce postoperative pain and ecchymosis. A 14-gauge, one-hole blunt cannula is connected to a 20 cc Luer-Lok syringe filled with the processed fat. During the injection the fat is dispersed evenly into the breast tissue. The cannula is withdrawn with a slow, steady pressure on the plunger, leaving behind a fine, noodle-like tube of adipose tissue. The amount should be limited to the bare minimum required to fill the tunnels left by the cannula. It is generally thought that fat within

2 mm of a blood supply will survive, but fat placed beyond that distance will undergo necrosis and will eventually be replaced by fibrous tissue, so bolus injection of fat grafts should always be avoided. The fat is placed in multiple planes and multiple tunnels from deep to subcutaneous tissue. Approximately two thirds of the collected fat is injected layer by layer into the submuscular plane, the retroglandular plane, and the intraglandular space. The remaining one third of fat is injected into the subcutaneous space. The goal is to inject approximately 250 cc to 300 cc of fat per session and per breast, depending on the availability of fat and the patient's habitus, such as her existing breast size and skin elasticity. After injection, the injected area can be carefully and gently molded and reshaped to achieve the desired shape of the breast. No dressing is used on the breasts postoperatively to avoid direct pressure on the breasts.

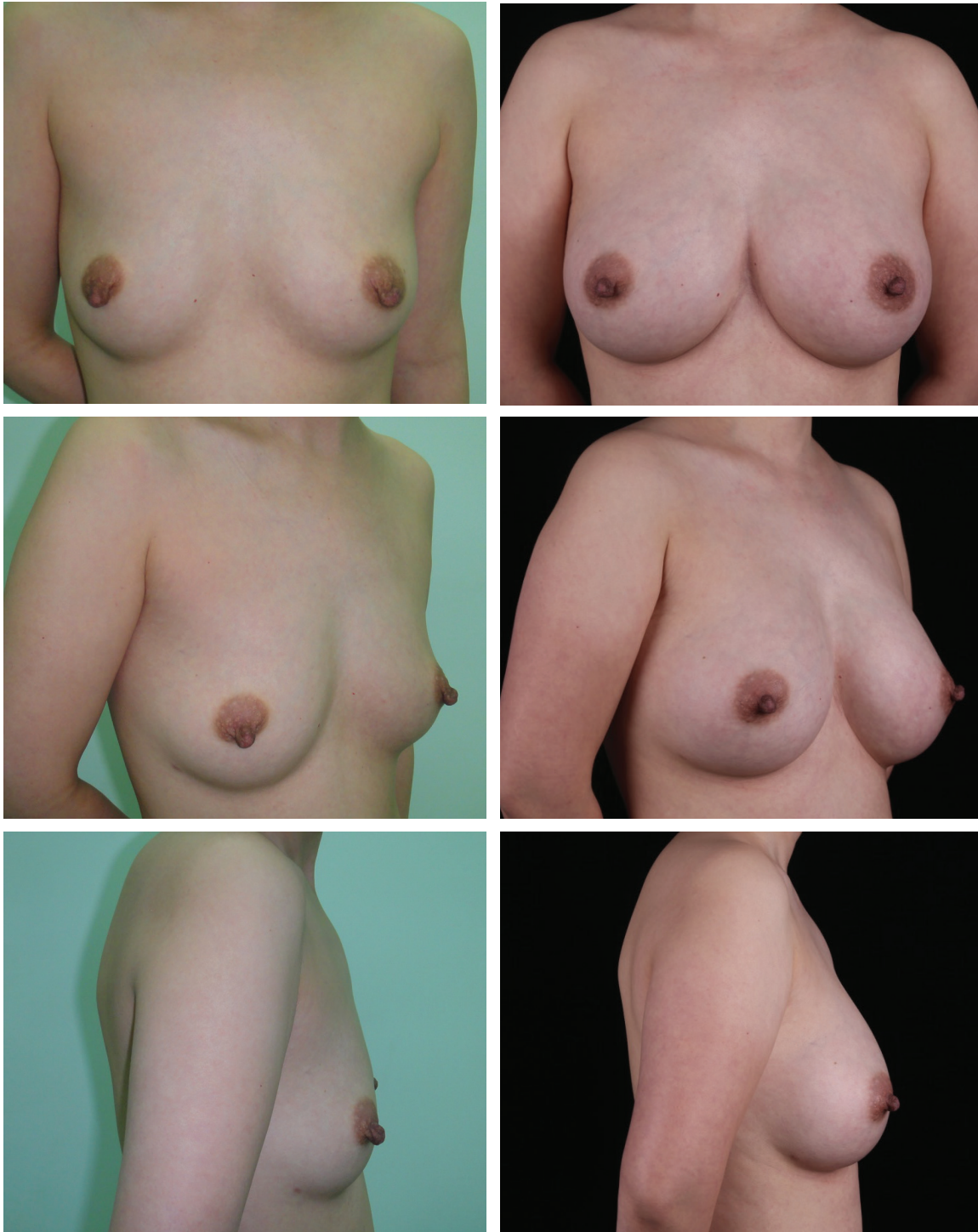
## Results

A total of 628 patients were involved in our series conducted from July 2002 to August 2013, of whom 45% underwent one session of fat grafting, 50% required two sessions, and 5% required three sessions to achieve optimal results. An average of 270 cc of fat was grafted per breast at each session (range 120 to 400 cc). The average clinical follow-up was 18 months (range 6 to 72 months). In most patients their breast size was significantly improved.



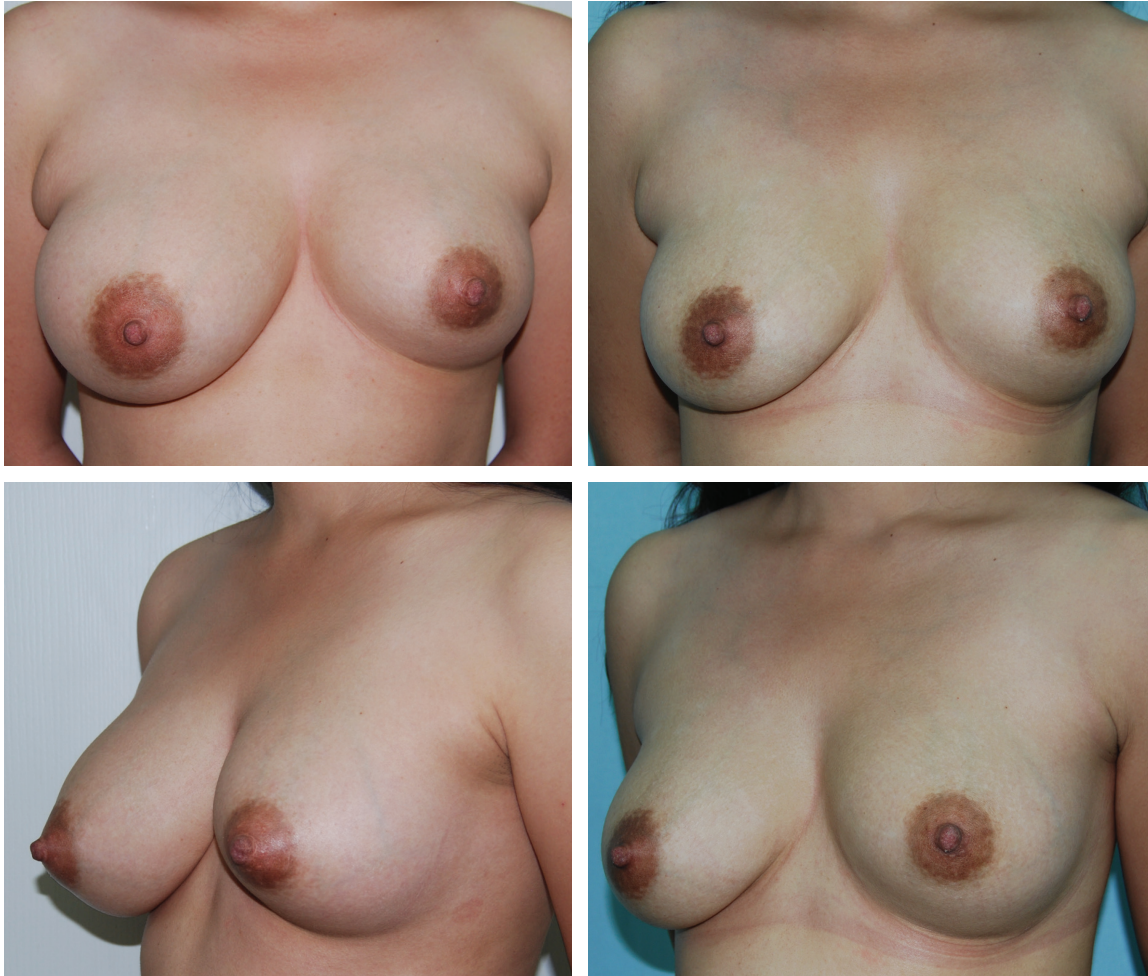
**Fig. 37-6**

This 21-year-old girl requested breast augmentation. She did not want breast implants and had previously undergone breast augmentation with fat grafting by another surgeon. However, her results were disappointing. We performed fat grafting with 220 cc of processed fat per breast, harvested from the thighs. At 8-month follow-up, her breast size had increased dramatically, and they felt natural and soft.



**Fig. 37-7**

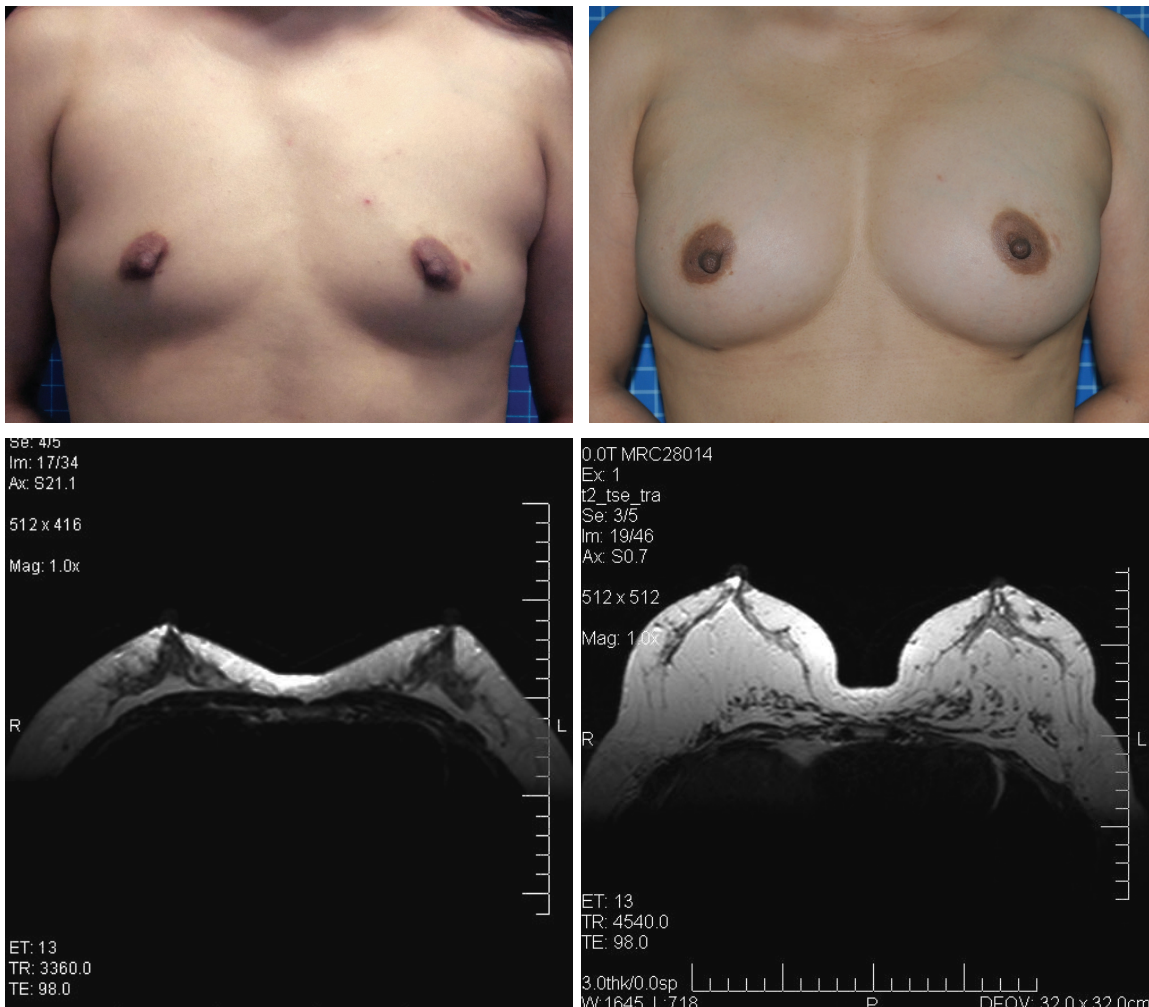
This 27-year-old woman sought breast augmentation. Because she requested significantly larger breasts, two sessions of fat grafting were performed, in which 280 cc and 300 cc, respectively, were injected into each breast, with an interval of 6 months. She is shown 20 months postoperatively with excellent results. Her enlarged breasts feel natural and soft. There are no palpable nodules and no calcification.



**Fig. 37-8**

This 21-year-old girl had major breast asymmetry and moderate mammary hypertrophy of the right breast, with some degree of ptosis. We performed right breast reduction by performing liposuction of 200 cc of fat, and we performed fat grafting to augment the left breast with 200 cc, harvested from the abdomen. Good symmetry is evident 7 months after the procedure.





**Fig. 37-9**

This 44-year-old woman presented with mammary hypotrophy after breastfeeding. We performed fat grafting for breast augmentation. In the first session, 260 cc of processed fat from the arms and back was placed in each breast. A second session was performed 3 months later, with 360 cc of fat harvested from the trochanteric area and injected into each breast. Her results at 11 months after the second procedure are quite satisfactory. Preoperative and postoperative T1-weighted MRIs reveal that the transplanted fat survived well and formed thick layers in the subcutaneous, retroglandular, intramuscular, and retromuscular planes.

## Complications

Several early and late postoperative complications of fat grafting for breast augmentation have been described, including localized infection of the harvest or injection site, sepsis, fat resorption and necrosis, calcification, formation of sclerotic nodules and granulomas, and a less than optimal outcome. Complications from this procedure are generally rare, but they are even less common and less severe than those observed from other breast operations.

For the donor site, this procedure has the same potential sequelae as that of a normal liposuction procedure, such as pain for about 48 hours, which can be well controlled with simple analgesics. Ecchymosis may persist for 3 weeks, and the postoperative edema resolves on average in 3 months. For the breast, the ecchymosis persists for 10 to 15 days, and the edema resolves in about 1 month. Breast volume is generally stable 3 to 4 months after surgery. The patient must be adequately informed that there will be progressive loss of breast volume within the first 3 months after surgery.

Fat grafting may result in varying degrees of nodule or cyst formation and calcification associated with necrosis of the injected fat tissue. This can occur as a result of excessive fat grafting into an area already saturated with fat, with subsequent ischemic necrosis of the injected tissue.

In our series, one patient developed a deep infection after breast augmentation with fat grafting. The infection resolved after drainage, irrigation, and administration of oral antibiotics. Nevertheless, her aesthetic result was not compromised. Two patients developed benign-appearing calcifications that were easily distinguishable from cancer. Three patients developed small nodules that revealed fat necrosis on aspiration.

## Discussion

We found that volume maintenance after lipotransfer for breast augmentation correlated well with the total amount of injected fat. If the volume of the fat transplanted into the breast is less than 150 cc on each side, the result will be disappointing. Therefore, in our opinion, fat grafting for breast augmentation is not suitable for very thin women who have insufficient fat deposits. Significant cosmetic improvement was achieved through two or three sessions of fat grafting in patients with adequate adipose tissue, even if their breasts are very small. Interestingly, we found that when patients received a second session of fat grafting, the cosmetic result was enhanced significantly. This may be attributed to the increased vascularization that resulted from survival of the previously transplanted fat.

The method we used is associated with a Chinese traditional philosophy—the “Golden mean,” which is Confucius’ philosophy. In addition to striving to achieve a natural, proportional breast for each patient, it means that we must achieve the best balance between a minimally invasive approach and the least ischemic time of the fat before it is transplanted into the breast. Everything has two aspects; we choose a point that achieves the best balance to achieve the maximal results. It is reported that most of adipocytes in aspirate preserved at room temperature beyond 4° C will undergo significant damage. The whole process of fat grafting should be performed as quickly as possible.

Syringe liposuction using smaller syringes (10 cc) with minimal negative pressure is considered to be the standard technique for harvesting of fat. However, this technique is time consuming when collecting a large volume of fat. Therefore we use a suction machine with low negative pressure (–400 mm Hg) for fat harvesting in an effort to reduce the liposuction time.

A grafted fat parcel that is too large in volume may suffer central necrosis in vivo because of a lack of adequate nutrition diffusion and failure of neoangiogenesis. Minimizing the amount of fat grafted with

each pass of the cannula during injection will maximize the surface area of contact between the grafted fat and the recipient tissue. Coleman's technique of fat grafting has been popularized and is known to many surgeons, which emphasizes an atraumatic method of fat harvesting, proper centrifugation, and miniscule parcels in each injection, aimed at maximal contact between transplanted fat and recipient tissue. However, for breast augmentation, this process takes approximately 3 hours to place 250 cc into one breast. The negative effects of extracorporeal ischemic time potentially outweigh the benefit of the technique of minimal trauma to fat for injection. To enhance the efficiency of fat injection while reducing the ischemic time, we use a 20 cc Luer-Lok syringe for fat injection in which 20 cc of fat contained in one syringe can be meticulously injected in 1 minute, still in accordance with the principles proposed by Coleman.

## Conclusion

Remarkable, long-lasting, natural improvements of the breast's size and shape can be achieved with fat grafting in most patients. The more painstaking the attention to details of fat harvesting, processing, and injection, the better the clinical outcome. Several important issues include low pressure but efficient technique in harvesting fat; condensing the lipoaspirate with a cotton pad after gentle washing and filtering; multilayered placement of fat; and reduction of ischemic time. All these factors are critical to the success of fat grafting to the breast. A good to excellent result from our patient series demonstrates the value of fat grafting for breast augmentation in Asian women.

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