Reconstruction of Acquired Breast Hypoplasia by Subcutaneous Scar Releasing and Repeated Fat Grafting Combination

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Summary: Breast hypoplasia may have a congenital or acquired etiology. One of the acquired reasons is postinfectious scars, which results in skin restriction and breast hypoplasia in the long term. Reconstruction of breast hypoplasia is performed by autologous tissues, implants, or both. In this report we present a hypoplastic breast reconstruction by subcutaneous scar releasing and multiple autologous fat grafting in a 21-year-old female with a right breast hypoplasia due to postinfectious scar. No complications were observed at 24 months follow-up after treatment by subcutaneous scar releasing and repeated (three times) fat grafting. Safe and natural reconstruction of mild breast hypoplasia due to fibrotic scars can be accomplished by performing a combination of subcutaneous scar releasing and multiple fat grafting. (Plast Reconstr Surg Glob Open 2015;3:e408; doi: 10.1097/GOX.0000000000000385; Published online 3 June 2015.)

Breast hypoplasia (BH) may have a congenital or acquired etiology, and most cases are syndromic and idiopathic. Congenital cases may be associated with Jeune and Poland syndromes. The acquired causes include burns, irradiation in childhood period, cutaneous hemangiomas, childhood traumas, and infections, which result in breast scars.1,2 Breast implants, autologous tissues, or both are options in the BH reconstruction. For secondary deformities such as traumatic or postinfectious scars, Z-plasties, scar excisions, or relaxations, skin grafts and flaps can be used in addition to basic breast reconstruction techniques.3

CASE REPORT

A 21-year-old woman was admitted to our clinic because of hypoplasia and deformity in her right breast. It was learned from her history that she had an infection in her right breast when she was 1 year old and was treated with antibiotics. After this treatment, she had a remaining fibrotic scar on her right breast. Additionally, she had noticed BH in her right breast relative to her left breast after puberty.

On physical examination, right BH with an oblique fibrotic scar from medial right breast to right axilla was observed (Figs. 1 and 2). The size of this scar was 20×0.5 cm and it had a continuation extending to the subcutaneous area and affected the right breast growth. Both breasts were Tanner grade 5, right areola-nipple/midclavicular distance (AN/MC) was 18 cm, and left AN/MC

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distance was 20 cm. We planned subcutaneous scar releasing and fat grafting treatment for her right breast. In the first operation, after submammarial and intrascar stab incisions, subcutaneous releasing was performed along the long axis of fibrotic scar tissue with a Coleman closed neck dissector (with 4-mm tip diameter; Mentor Medical Systems, Santa Barbara, Calif.) cannula. Dissection was achieved by subcutaneous relaxation.

After scar releasing, 100 mL tumescent solution was infiltrated into the periumbilical abdominal subcutaneous area with a 50-mL syringe. Typical tumescent solution contains 0.05–0.1% lidocaine, epinephrine 1:1,000,000, and sodium bicarbonate in 1 L of normal saline. Twenty minutes after the tumescent infiltration, harvested fat graft was centrifuged at 2000 rpm for 3 minutes in a standard centrifuge device. After creating multiple microtunnels, the centrifuged 100 mL fat graft was infiltrated into the right breast radially and multicentrically with 2 stab incisions (submammarial and upper-pole intrascar) by a 7-mm Coleman Infiltration Style I cannula. Two thirds of the fat graft was injected onto pectoral fascia, and the remainder one third of the fat graft was infiltrated into the subcutaneous area in a retrograde fashion. The same operational procedure was repeated with centrifuged 50-mL fat graft 3 times every 6 months. In total, 250-mL fat graft was injected. After 2 years follow-up, right AN/MC distance measured 19 cm and left AN/MC distance measured 20 cm (Figs. 3 and 4). We did not observe any postoperative complications such as infection or fat necrosis in magnetic resonance imaging (Fig. 5), and the patient’s satisfaction was high.

Fig. 1. Preoperative anterior view. Note the right breast scar and hypoplasia.

Fig. 2. Preoperative oblique view.

Fig. 3. Postoperative 2 years anterior view. The photograph was taken 3 months after the last fat grafting.

Fig. 4. Postoperative 2 years oblique view. The photograph was taken 3 months after the last fat grafting.
DISCUSSION

BH can be congenital, idiopathic, or secondary to fibrosis after burn, infection, or trauma. BH treatment includes autologous methods, breast implants, or both. Scars with fibrotic bands may restrict breast growth, especially in postburn deformities. Similar scars may occur in healing processes after breast infections. Z-plasty, excision, scar releasing, skin grafts, flaps, tissue expanders, and fat grafts are useful reconstructive alternatives in the treatment of fibrotic and restricted scars.

In 1893, Neuber was the first to apply autologous fat grafts to depressed facial scars. Two years later, in 1895, Czerny transferred the first fat graft to the breast postmastectomy. The modern fat grafting technique was described by Coleman. Even though modern fat grafting is frequently used for soft-tissue reconstruction, biochemical mechanisms of this technique have not been well defined yet. One hypothesis of this mechanism is that fat grafts transport mesenchymal cells, progenitor cells, and numerous growth factors to their new location. Autologous fat grafting has been shown to increase microcirculation and neoangiogenesis in experimental studies.

Thirty to forty percent of infiltrated fat grafts reabsorb within 1 year, and this ratio decreased in repeated attempts, which has been shown in the literature. When fat is to be transferred to scarred tissues, scars have to be released before graft transfer. This technique was first described by Rigotti (who used a pickle fork to release a heavily scarred radiated recipient site) and is used to release subcutaneous bands and scars. Following scar releasing, we performed repeated fat grafting to maintain breast symmetry and provide a possible positive effect on long-term scar healing. The right AN/MC distance increased 1 cm and breast symmetry was achieved after 2 years of follow-up.

Studies show that selection of fat graft donor sites (abdomen, thigh, buttock, etc.) has no effect on graft resorption. In this case, we selected the abdominal region for fat harvesting because the patient’s abdominal region was mildly fatty.

From past research, known advantages of fat grafting for BH include the following:

- Autologous procedure and has no risk of rejection
- Procedure is safely repeatable until patient satisfaction is achieved
- Minimally invasive
- Less hospitalization and operation time compared with other procedures
- Easy contouring
- Less donor area morbidity
- High success rate
- Positive effect on scar healing
- Natural breast feeling.

The disadvantages of fat grafting for BH include the following:

- Graft resorption.
- Microcalcification in breast. It was thought that these microcalcifications may cause some problems in the diagnosis of breast carcinoma. However, recent research shows that there is no correlation between fat grafting and carcinoma.
- Fat necrosis.
- Infections of donor and recipient areas.

In this case, we thought that hypoplasia and asymmetry of breasts were not severe enough to require flap reconstruction, and thus, we have avoided flap incision scars. Additionally, in fat grafting technique, there is no risk for a capsular reaction and foreign body reaction. Another advantage of this technique is preventing an unnatural breast feeling and maintaining a same frequency movement of both breasts. However, the described technique needs multiple operations and thus needs multiple follow-up visits.
In our case, there was minimal fat graft resorption and no other complications such as infection or fat necrosis (Fig. 5). The problem of fat resorption was solved with repeated grafting in the follow-up period.

**CONCLUSION**

Performing subcutaneous scar releasing and repeated fat grafting can provide safe and natural reconstruction of mild BH due to fibrotic scars.

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