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Lower pole reconstruction in a post-burn breast using an anterolateral thigh flap: A case report

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ABSTRACT

Severe chest burns in children that prevent breast development at puberty cause challenging problems. Burns result in contracture that leads to size, shape, and positioning problems. In the present case, we used a free anterolateral thigh (ALT) flap to release lower pole contracture in a breast with a burn deformity. A 17-year-old healthy girl had suffered a severed breast deformity due to burn contracture and underwent surgery to release the lower pole contracture of the breast. The patient was followed for eight months and was satisfied with her outcome. An ALT flap should be considered as a versatile option for partial breast reconstruction in selected patients who have deformities due to burns.

Key words: *Anterolateral thigh flap, burn, breast, contracture*

Introduction

Pre-pubertal deep burns of the chest can cause severe breast deformities in girls, such as soft tissue damage and contracture, leading to size, shape, and positioning problems in affected breasts [1]. The surgical treatment is challenging for reconstructive surgeons. The most commonly used option is a split-thickness skin graft (STSG) after excising the burned tissue. Other treatment techniques include a full thickness skin graft, local flaps, and free flaps [2].

In this case, we used a free anterolateral thigh (ALT) flap to release the lower pole contracture in a post-burn breast.

Case Report

A 17-year-old healthy girl with a low body mass index (BMI, 18 kg/m^2) suffered a deep third-degree burn on her chest and abdominal wall at the age of 3 years. She was treated conservatively by our senior author 14 years ago. She underwent multiple Z-plasties and scar revisions to release the contracture. At the beginning of

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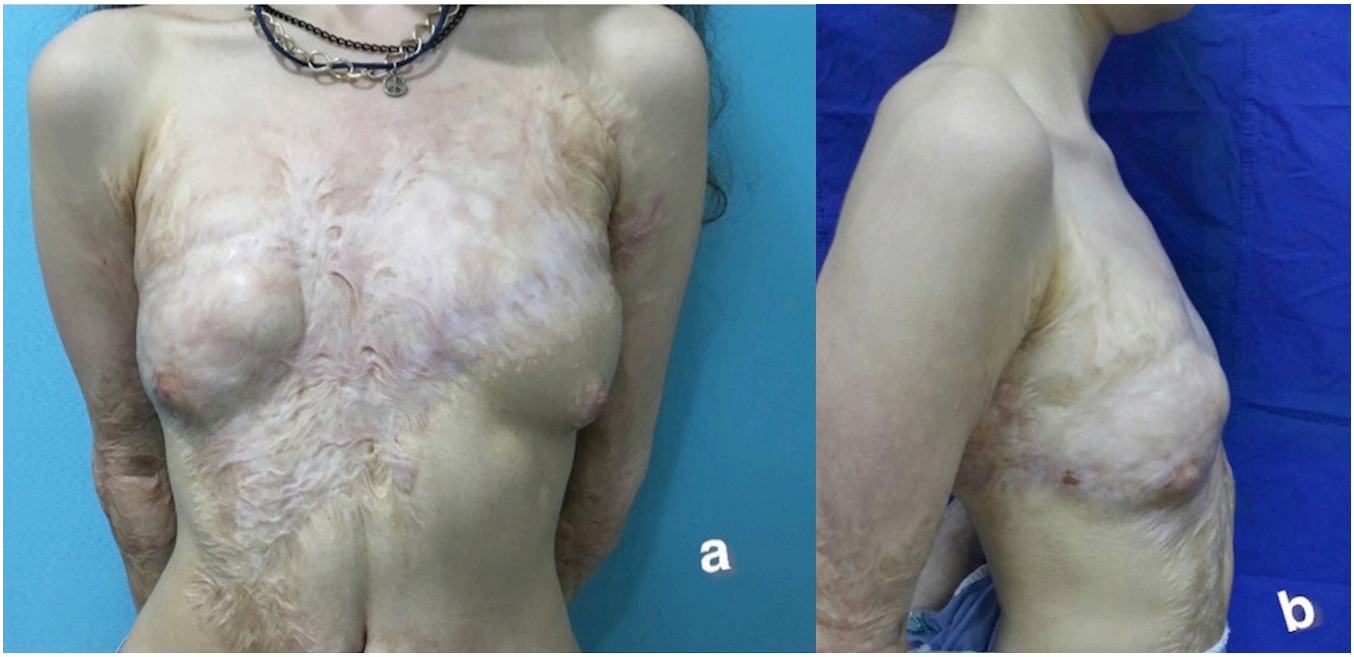

Figure 1. Preoperative views of the patient. **(a)** Anterior, **(b)** lateral.

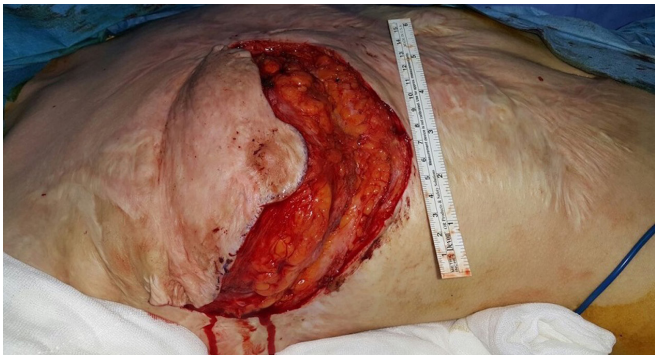

Figure 2. Intraoperative view of the tissue defect.

puberty, bilateral breast tissue was unable to grow because of contracture of the lower pole. She had also undergone tissue expansion two years ago for a disfigured left breast, and the result was not satisfactory for her.

She presented with a vaguely contoured, effaced inframammary fold, and a flat, underdeveloped, hypoplastic right breast, seeking aesthetic and functional reconstruction. (Figure 1).

During preoperative planning, ALT flap was preferred. Under general anesthesia, the contracted tissue was released, which resulted in a 17 × 8 cm tissue defect (Figure 2). The ALT flap was harvested with a 20 × 9 cm skin paddle, and the harvested flap was placed above the exposed area and anastomosed to the ipsilateral internal mammary vessels at the lower level (fifth intercostal space). Ischemia time was 55 min.

Shaping was performed, and the natural ptosis of the flap was used to provide fascial components for the flap, buried beneath the chest skin flap. The donor site was closed primarily, except for a 5 × 5 cm area that was covered with an STSG. Wound healing was uneventful. The patient was followed up for eight months, and she was satisfied with her results (Figure 3).

Discussion

Reconstruction of burn-sequel deformities of the chest and breast uses similar modalities to those used for other parts of the body. The approaches include the release of the contracted or scarred tissue, relief of the fibrotic tissue, and closing of the wound with various surgical techniques, such as an STSG, full-thickness skin graft (FTSG), and flaps [2]. The STSG is the most common method because it is simple, readily available and can be meshed (up to 1:9) to cover large areas. Secondary contraction of an STSG can lead to recurrence of contractures [3]. In our case, this surgical option was not preferred because it would have resulted in poor

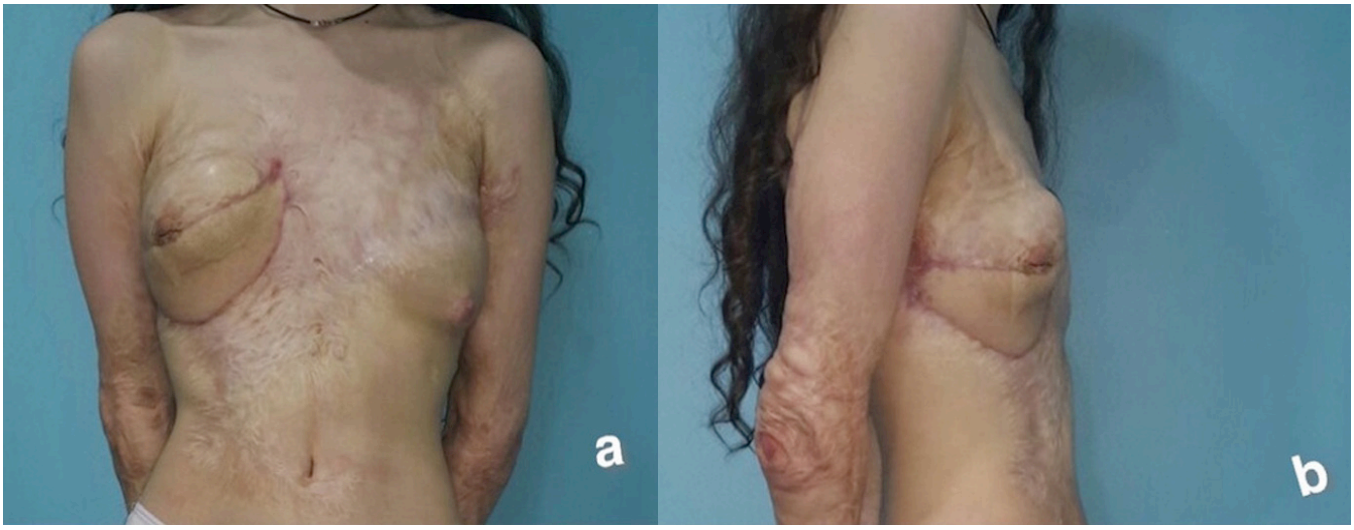

Figure 3. Postoperative views of the patient at eight months after surgery. **(a)** Anterior, **(b)** lateral.

aesthetic and functional appearance.

The second option was the FTSG, which has the drawback of donor site inadequacy and it the possibility of not providing the desired shape. Another skin graft option is an expanded FTSG, but this involves a two-stage operation. Moreover, extrusion, infection, and damage to the skin must be considered during the expansion period. The third option was skin expansion, but the patient had already undergone tissue expansion of the contralateral breast with unsatisfactory results.

Multiple Z plasties were applied to our patient. However, breast development was affected by the recurrence of contractures during puberty period. The unsuccessful Z plasties were not considered for reconstruction.

Flaps are another alternative for reconstructing burn deformities, as they provide excellent coverage and can be adapted to the defective area, thus providing satisfactory functional and aesthetic outcomes.

Our case is in mild deformity in classification made by Özgür et al. [4,5] Although the breast development of our patient was normal, the main problem was lower pole contracture due to skin insufficiency. Because she had enough breast and adipose tissue, the patient did not need complete breast reconstruction. We did not consider using the donor sites well-described for autologous breast reconstruction, such as the lower abdomen, gluteus, inner thigh. The patient was quite thin, and it is not suitable to use deep inferior epigastric artery perforator (DIEP) flap, lumbar artery perforator flap, and superior gluteal artery perforator (SGAP) flap. One of the alternative option may be thoracodorsal artery perforator (TDP) flap or latissimus dorsi musculocutaneous flap. This flap site was burned area as it could not be used.

Loss or deterioration of the areola and breast complex due to burns does not indicate that milk glands will not develop or that lactation will not occur after pregnancy. Breast buds are protected, but the surrounding scar and contracture can inhibit the development of the breast from the outside [5]. Since our patient was 17 years old, she was treated with fasciocutaneous flap after radical scar releasing in order to prevent the development of breast. Local flaps options were insufficient.

A soft, pliable skin flap was needed to cover the lower pole of the breast. This maneuver allowed the breast to be projected and increase the limited breast volume. An ALT flap was preferred for this purpose. It is a longitudinally formed thigh flap described previously for breast reconstruction [6-8] and suitable for a two-tiered approach and has a long pedicle and skin island, thus covering soft adipose tissue adequate-

ly. It has also been used for patients with low BMI and small breasts [6]. Our case had similar specifications for breast reconstruction with the ALT flap. We used the free ALT flap for partial reconstruction at the lower pole correction, and the patient was satisfied with her result.

On the other hand, significant disadvantages of ALT flap are limitations in flap width and visible donor site morbidity [7-9]. In this case, a 5 × 5 cm section of the donor site had to be covered with an STSG.

In conclusion, this flap has the long and large skin paddle, a long vascular pedicle and soft tissue component more closely resemble breast tissue. The ALT flap is a versatile alternative that should be considered for partial breast reconstruction in selected patients with burn deformities of the breast.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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