# Breast Reduction in the Burned Breast

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**KEYWORDS**

• Breast reduction • Burn • Burned breast • Mammaplasty

**KEY POINTS**

- Mammary hypertrophy can occur in the postburn breast, despite scarring and contractures; patients with burned breasts exhibit the same symptoms of symptomatic macromastia as patients with unburned breasts do.
- Although breast volume reduction is the ultimate goal, the contour of the breast must first be restored by releasing scar contractures.
- Regardless of the reduction mammaplasty technique used, the inelastic nature of grafted and scarred scar requires a conservative approach to tissue elevation and transposition.

## INTRODUCTION

With improvements in burn care, patients survive increasingly large total body surface area (TBSA) burns. In a series of large TBSA burns, the breasts were the most frequently injured area within the trunk/perineal region.[1] McCauley and colleagues[2] noted that 71% of female patients with burns to the anterior chest wall with involvement of the nipple-areolar complex (NAC) will require surgical intervention. Mammary hypertrophy can occur in the postburn breast, despite scarring and contractures. Patients with burned breasts exhibit the same symptoms of symptomatic macromastia as patients with unburned breasts do. This condition may occur unilaterally in which a reduction mammaplasty may be required for symmetry with the burned breast. Alternately, bilateral reduction mammaplasties may be required if both breasts are hypertrophic.[3] Thai and colleagues[4] noted that, although many plastic surgeons are reluctant to operate on burned breasts for fear of devascularizing the skin graft or NAC, reduction mammaplasty in this group of patients is safe and carries minimal risk if certain key concepts are followed.

## RISKS OF OPERATING ON BURNED BREASTS

Early tangential excision of burns to the anterior chest wall is currently the standard of care. McCauley and colleagues[2] note, however, this approach is modified at many burn centers when dealing with the anterior chest wall burns in young female patients. In such cases, the eschar may be allowed to demarcate and separate before tangential excision; some surgeons mark the areas of the breast bud before surgical intervention in order to avoid destruction during debridement of more superficial burns. Such advancements in surgical technique avoid the risk of damaging a breast bud uninjured by the burn; in some patients this undamaged breast bud creates macromastia in the future.

Surgical manipulation of the hypertrophic burned breast comes with its own risks, including flap necrosis, poor wound healing, and poor aesthetic outcomes. As discussed later, a conservative stepwise approach is key.

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## EVALUATION OF THE HYPERTROPHIC BURNED BREAST

Several factors are assessed preoperatively to evaluate the extent of the damage and its effect on mammary hypertrophy. Just as McCauley and colleagues[2] note in reconstruction of the burned breast, the extent of the deformity, the location of the deformity, and the status of the surrounding soft tissue are all assessed before embarking on any surgical plan. Scar contractures can be detected early, particularly when an uninjured breast serves as a landmark for distortions in shape or NAC position. Deformity of a hypertrophic breast is addressed separately from deformities of the inframammary region alone.

## PRINCIPLES FOR REDUCING THE BURNED BREAST

### *Improve Breast Contour by Releasing Scar Contractures*

Completely release breast tissue distorted secondary to burns through either incision or excision of burn scars followed by split thickness skin graft (STSG) coverage.[5] Cutaneous flaps, Z-plasties, fasciocutaneous flaps, and musculocutaneous flaps may be required. Although the end goal is to reduce mammary volume, additional local tissue may need to be brought into the breast mound to improve contour before reduction mammaplasty. An inverted T incision with STSG between the breasts in the midline may be required to relax scar tissue over the breast mounds in the case of bilateral breast entrapment (**Fig. 1**). Some advocate for correction of NAC distortion at this time as well.

### *Delay Until Grafts Are Sufficiently Healed and Breasts Are Fully Developed*

Grafts should be allowed to heal for at least 6 months and until the breasts are fully developed. Some investigators note that surgery is indicated when there is bulging of the breast tissue in an unburned area or when the scarred skin is obviously restricting breast growth.[6]

### *Be Conservative When Designing the Resection Pattern*

The approach to reduction mammaplasty in burned patients is similar to that used in patients with symptomatic macromastia. As emphasized in Thai and colleagues,[4] moderately thick skin flaps (1.5–2.0 cm) and limited undermining will decrease the risk of flap necrosis. When designing the keyhole area of the Wise pattern, anticipate that the inherent inelastic nature of the skin grafts preclude wide transposition or advancement of such flaps (**Fig. 2**).

### *Consider Balancing Procedures at the Same Time*

Although burned breasts can reach normal size and position, they differ from unburned breasts in their response to aging and development of ptosis. Thick scar contractures and the inelastic nature of the STSG serve as a sling that prevents the burned breast from becoming ptotic with aging. This asymmetry is most obvious in patients with only one burned breast; balancing procedures, such as mastopexy or reduction of the unburned breast, are recommended at the same time to restore

**Fig. 1.** This 21-year-old woman suffered a burn of the anterior chest wall in childhood with multiple subsequent debridements and skin grafting. She later underwent multiple scar contracture releases, including a midline inverted T incision with skin grafting over the sternum to improve breast contour and a laterally based fasciocutaneous flap to release and create the left breast inframammary fold.

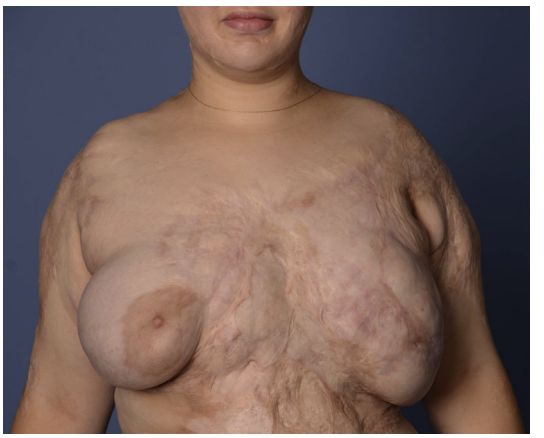

**Fig. 2.** This patient's full-thickness burn over the midline anterior chest both destroyed and distorted the breast parenchyma of both medial breasts. Any tissue mobilization medially should include thick skin flaps and conservation transposition.