

## Burn Scar Reconstruction of the Neck with FTSG Obtained from Lower Abdominal Skin

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**Abstract-** Burns account for a significant proportion of injuries, and of these the face, neck, and anterior torso are commonly affected. Burn scars remain a lasting reminder of the insult both for the patient and the outside world. There is little doubt that the change in appearance and the limitation imposed by a burn scar contribute to negative body image. Treatment of hypertrophic scars in the neck has been quite challenging if there is no intact tissue for local flaps. So application of full-thickness skin grafts could be of great value. We applied full-thickness grafts obtained from lower abdominal skin for treatment of severe neck contractures in four patients when other treatment modalities such as local flaps could not be used. Full-thickness skin graft of the neck is a safe and reliable treatment option with fairly good functional and aesthetic results. It has little donor site morbidity in spite of providing a large surface area of full-thickness skin.

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### Introduction

Hypertrophic scar formation after burn wound healing is a major problem.

Reconstruction of burn scars remain one of the most challenging aspects of plastic surgery. The debilitating functional problems, cosmetic deformities and frequent lack of autologous tissue to replace with, demand therapeutic efforts to be well planned and executed. If adjacent skin is available, serial excisions of the scar or tissue expanders could be used. If no adjacent tissue is available, the use of skin grafts from a reasonable donor site should be considered (1).

### Patients and Methods

We present a series of 4 women who sustained full thickness burns in childhood with subsequent burn scarring & contracture. They were suitable candidates for abdominoplasty or mini abdominoplasty and the skin excised was used for synchronous burn reconstruction or contracture release. The patients were 26 to 40 years old. With classic abdominoplasty or mini abdominoplasty incisions, initially full thickness skin was excised and then the donor sites were closed primarily. The full

thickness skin (FTS) was defatted meticulously up to subdermal area, making it a thin FTS (Figures 1 & 2).

Donor site scars were released and all fibrous tissues were removed and after meticulous hemostasis with bipolar cauterization and irrigation, they were prepared for grafts. We used the harvested FTSG for the release of neck contracture in all 4 cases, and for reconstruction of forehead and nose scars in just two of them. The grafts were sutured to underlying bed and fixed with tie-over bolster dressing. After removal of dressing, cervical collar was used for 6 months.



**Figure 1.** Mini abdominoplasty incisions, Full Thickness skin was excised

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**Figure 2.** The full thickness skin was defatted meticulously up to subdermal area

**Case 1**

A 40 year old woman was injured flame burn. She was involved more in neck and shoulders. The patient had excess lower abdominal skin which was used as FTSG to reconstruct neck scar. Neck extension improved considerably after operation (Figures 3 & 4).



**Figure 3.** Neck ,shoulders burn



**Figure 4.** Full thickness skin graft used to reconstruct neck scar

**Case 2**

A 29-year old female with burn scar in neck, shoulders and posterior trunk following self-induced burn (suicide attempt). She had flexion contracture of neck which was improved afterwards (Figures 5, 6, 7 & 8).



**Figure 5.** Severe neck and anterior axilla flexion contracture



**Figure 6.** Released contracture and full thickness skin graft



**Figure 7.** The same patient before operation



**Figure 8.** After operation,scar release, and FTSG



**Figure 9.** Burned on Neck ,shoulders and trunk



**Figure 10.** Abdominal skin used to reconstruct Neck scar



**Figure 11.** Neck scar contracture, and Trapezius flap



**Figure 12.** Contracture released to reconstruct with full thickness skin graft

### Case 3

A 35-year old female with flame burn on neck, shoulders and trunk in childhood. Excess abdominal skin was used to reconstruct neck scar and great functional and aesthetic improvement was achieved (Figures 9 & 10).

### Case 4

A 28-year old female with burn on neck, shoulders and breasts who had once undergone trapezius flap, but unfortunately she still suffered from flexion contracture of neck. Excellent result was obtained after using skin harvested from miniabdominoplasty procedure as a FTSG (Figures 11 & 12).

### Results

In all cases, moderately good skin color and texture match was achieved. The functional and aesthetic result

was considerably improved by the use of abdominal skin. Donor site morbidity was not observed while abdominoplasty helped to improve the negative body image. Postoperative recurrence of contracture was minimal and largely due to not following the postoperative recommendations precisely by the patients.

## Discussion

The primary aim of a cosmetic surgeon is to prevent burn scar deformity by rapid wound coverage, minimizing burn scar and assiduous attention to post operative splinting and compression therapy. Reconstruction of a burn patient is often a complex multi-stage procedure requiring repeated surgeries.

The approach presented here advocates a stepwise prioritized approach aiming at both maximum function as well as aesthetic improvement.

Post-burn contractures may require surgical release and for the split-thickness or full-thickness skin-graft coverage, local flaps or free flaps may be considered (10).

Burn scar contractures of neck represent a continuing problem for plastic surgeons. This was especially true in those patients who had previously suffered from burns to entire anterior neck and shoulder. These patients need grafts because the adjacent skin could not be used as local flaps following tissue expansion. One advantage of skin grafts is that non-bulky skin from a previously uninjured area of the body is used instead of scarred and compromised adjacent skin. Full-thickness skin grafts resemble more closely to normal skin in texture, color, and resilience than split-thickness grafts. However, the take of full-thickness skin grafts is less than split-thickness skin graft, and also suffer from the drawback of limited availability (10,11). Full-thickness grafts also contract much less as there is an inverse relationship between thickness and graft contracture. (12-14) Iregbulem (5) reported excellent "take" with no graft loss in a review of full-thickness skin grafts used in post burn contracture releases in 136 consecutive cases. In our series, we were not confronted with any graft loss. Mini abdominoplasty or abdominoplasty may be combined with burn reconstruction to provide a good skin quality in a single operation. The excess skin from the site of cosmetic procedure could be used for resurfacing medium and large burn areas. In conclusion, the use of skin grafts for post burn contracture release is simple, reliable, and safe. They are particularly useful when we don't have other options such as local flaps. Their main disadvantage is tendency to contracture

formation which necessitates further release; however that is less of a problem when using full thickness skin grafts. The excess skin from the site of an aesthetic procedure could be used for this problem.

We believe that FTSG harvested from abdominoplasty site is a good option after removal of burn scars of face and neck, without donor site morbidity and improved patients body contour.

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