Original Article

# Reconstruction of Hemi Fascial Scars Using Expanded Transposition Flap of Neck

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## ABSTRACT

**Background:** Neck tissue expansion is a widely accepted method for facial scar reconstruction due to its optimal color and texture match

**Methods:** This retrospective study evaluated outcomes in 42 patients who underwent hemifacial scar reconstruction using tissue expanded transposition flaps from the ipsilateral neck.

**Results:** Patient records were reviewed for demographic data, surgical variables, and complications. The majority (95.2%) had burn-induced scars; a single expander was used in 92.9% of cases, while three patients required two expanders. The mean expansion duration was 115.86 days. Major complications occurred in 9.5% of patients, and minor complications in 14.3%; extrusion and infection were most common

**Conclusion:** Transfer of expanded neck skin as transposition flap, is demonstrated to be a reliable reconstructive technique for complete resurfacing of hemifacial scars with minimal contour deformities and optimal final scar.

**KEYWORDS**
Burn Injuries; Facial scar; Tissue expander; Neck

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## INTRODUCTION

Burn injuries as one of the most destructive injuries affecting healthcare system in all countries [1,2,3]. Facial burn scar may lead to significant disfigurement and contractures with high aesthetic and functional impact [4,5]. Hence the main goal of facial reconstruction surgery is to restore aesthetics and function [4].

Among available techniques—such as skin grafts, local flaps, distant flaps, free flaps and laser resurfacing [5-7,] —tissue expansion through increasing the skin surface area produce new tissue to resurface defects in a nearby areas [8-11]. As a gold standard technique, neck tissue expansion provides adequate amount of optimal skin to replace scarred face with the skin with highest color and texture match [12-14]. The convenient way of expanded tissue transfer from neck to face is advancement flap, that is associated with some contour deformities and unfavorable final scar position [15-19].

To avoid these potential unfavorable results, we used expanded transposition flaps as our standard technique of transfer of expanded

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neck skin for hemifacial resurfacing. In this retrospective study, we analyzed the outcome of cases with hemifacial scar deformities reconstructed with expanded flaps transposition flap from ipsilateral neck.

## METHODS

A retrospective review was conducted of patients with hemifacial scars operated as tissue expanded transposition flap from neck. In all patients, through intra scar incision, at least 3 cm far from mandibular border, appropriate rectangular tissue expander was placed in supra-platysmal plane within the ipsilateral neck in vicinity of hemi-facial area planes to be reconstructed. Serial expansion in timely manner continued until the required surface area to maximally cover the facial scar be achieved. Then in second stage, tissue expander removed and the expanded neck skin was used to resurface the area of resected hemi-facial scar. The mode of transfer in all cases in this study were transposition flap. Data collected included demographics, surgical details, and postoperative complications. Statistical analysis was performed using SPSS(v.16) (Chicago, IL, USA), applying appropriate descriptive methods for qualitative and quantitative data.

## RESULTS

A total of 42 patients underwent hemifacial scar reconstruction using the expanded transposition flap technique. The mean patient age was 28.2 years (range 5–57), with 64.3% females and 35.7% males. The predominant etiology was burn injury, accounting for 95.2% of cases; and traumatic scars represented the remaining 4.8%. In all patients a single tissue expander was placed in the ipsilateral neck. Three individuals required additional re-expansion to complete the treatment. The average surgery time for placement of tissue expander was 53.9 minutes; mean hospital stay was 28.2 hours.

Major complications (Table 1) occurred in 9.5% (4/42) of patients and included expander extrusion (2 cases) and partial flap necrosis (2 cases), both requiring surgical intervention. Minor complications were noted in 14.3% (6/42) of patients, consisting primarily of superficial infection (3 cases) and tissue ischemia (3 cases); all resolved with conservative management.

## DISCUSSION

This study shows that hemifacial scar reconstruction using expanded transposition flaps from the neck provides reliable and aesthetically favorable outcomes. (Figure 1)

In our series of 42 patients, a transfer of expanded neck skin enabled complete resurfacing of the hemi-face. Final scars were optimally placed along facial aesthetic unit border, the cervico-mental angle was preserved, and the complication rate was low (9.5% major, 14.3% minor), with high patient satisfaction regarding both function and appearance.

Geometrically, transposition flaps provide clear reconstructive advantages: (1) They enable resurfacing of the entire ipsilateral hemiface in one operation, expanding reconstructive reach. (2) Scars are inconspicuously placed on the borders of facial aesthetic units, blending into natural anatomical

**Table 1.** Complications of tissue expander placement

| % Per Expander | % Per case | N | Complication |
|---|---|---|---|
| Major | | | |
| Dehiscence | 1 | 2.38% | 2.22% |
| Deflation | 1 | 2.38% | 2.22% |
| Skin perforation | 0 | - | - |
| Extrusion | 2 | 4.76% | 4.44% |
| Minor | | | |
| Seroma | 1 | 2.38% | 2.22% |
| Infection | 2 | 4.76% | 4.44% |
| Hematoma | 1 | 2.38% | 2.22% |
| Leak | 0 | - | |
| Ischemia | 2 | 4.76% | 4.44% |

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**Figure 1.** Left sided hemifacial burn scar with severe disfigurement, front and oblique views (Left); Completed ipsilateral Neck expansion, front and oblique views (Middle); Resurfaced left hemi-face with expanded transposition flap, front and oblique views (Right)

boundaries for superior cosmetic results[20]. (3) The well-defined cervico-mental angle and transition line between the face and neck are preserved, as the flap's rotation avoids the blunting effect seen with direct advancement. These geometric benefits yield optimal contour, minimize visible scarring, and produce more harmonious facial reconstruction compared to advancement flaps—which may result in excessive tension, less coverage, and loss of facial-cervical distinction. Our experience and literature strongly support the supremacy of transposition flaps in expanded neck flap facial reconstruction[21,22] Our findings are in accordance with previous studies on tissue expansion for facial reconstruction. Yamin et al. reported that over 94% of reconstructed scars and 98% of donor site scars were deemed acceptable, with most patients satisfied with their outcomes. Their overall complication rate was 13.9%, comparable to our results[23]. Other researchers have noted that tissue expansion allows for substantial resurfacing, with most lesion areas (over 68%) being completely removed after a single expansion, and



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success rates above 85%[21]. In our study, complete hemifacial resurfacing was achieved in all patients with a complication rate of 9.5% for major events, closely aligning with the 8.73% overall complication rate reported by Azzi et al. in their systematic review of 7,058 head and neck tissue expanders [24]. This review, as well as a large case series by Bauer et al., identifies expander extrusion and infection as the most frequent complications, echoing our findings of primary complications being extrusion and tip ischemia[21,24]. Further, closure and success rates in our series mirror those from recent systematic reviews and large retrospective studies. A review on post-burn contracture reconstruction of the head and neck found most facial areas (over 68%) could be resurfaced after a single round of expansion, with an acceptably low-risk profile[24,25]. Similarly, a systematic review summarized that high closure and functional success rates can be achieved with cervical tissue expanders, reinforcing the reliability of our approach. Systematic reviews broadly confirm that expanded neck flaps provide superior color and texture match compared to traditional skin grafts or regional flaps, with distinct advantages in contour restoration and minimized donor morbidity[21-23]. The complication spectrum in our practice did not exceed established benchmarks, and all surgically-managed adverse events resolved, consistent with the literature.

Potential limitations of our study include its retrospective nature and single-center experience, which may introduce selection bias and limit the generalizability of our findings. Follow-up duration was variable, and long-term aesthetic or functional outcomes may not be fully captured. Additionally, the lack of a directly comparable control group treated exclusively via advancement flaps precludes definitive quantification of the relative advantages of transposition flaps.

Overall, our results reinforce the role of expanded transposition flaps as a preferred strategy for the reconstruction of extensive facial scars, offering reproducible, aesthetically superior outcomes with acceptably low complication rates, consistent with published literature.

## CONCLUSION

Transposition flaps using expanded neck skin offer a clear advantage over conventional advancement flaps for hemi-facial scar reconstruction. They enable reliable coverage of complex, irregular defects with favorable aesthetic outcomes and manageable complication rates. Plastic surgeons should consider this method as the preferred approach in similar reconstructive cases, especially following severe burns.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interests.

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