

A New Technique for Releasing Neck Contracture and bands by Multiple Y-V Advancement Flap

Sangar Abubakir Agha^{1*}, Jalal Ali Hassan²

¹ MBChB, FKBMS (General Surgery), Kurdistan Board Candidate in Plastic and Reconstructive Surgery, Kurdistan Higher Council of Medical Specialties (KHCMS), Suleimani Hospital for Burn, Plastic and Reconstructive Surgery, Sulaymaniyah, Kurdistan Region, Iraq; Ministry of Peshmerga, Kurdistan Regional Government, Iraq.

² Assistant Professor of Plastic Surgery & Consultant Plastic Surgeon, Department of Plastic Surgery, Sulaimani Hospital for Plastic, Burn and Reconstructive Surgery, Kurdistan Region, Iraq.

Corresponding Author:

Sangar Abubakir Agha

Email: sangarmirawdalisurgery@gmail.com.

ABSTRACT

Background and Objectives: Post burn cervical contracture and neck(scar) bands can severely limit neck extension and impair functions, while also causing secondary facial distortion. This study assessed the clinical utility of a new technique of multiple Y-V advancement flaps for releasing post burn neck contracture and restoring cervical mobility.

Methods: A retrospective observational case series was conducted at Sulaimani Hospital for Burn and Reconstructive Surgeries (Sulaimaniyah, Iraq). Ten patients with post-burn cervical contracture/bands treated primarily by multiple micro-Y-V advancement flaps under LA (1983–2025) were included. All outcome data were obtained from OPD documentation. Outcomes were maximal neck extension assessed by mentosternal angle (degrees) and mentosternal distance (cm) preoperatively versus latest postoperative follow-up. Patient satisfaction (0–10) reflecting overall satisfaction with function and appearance and documented complications were recorded.

Results: All patients were female; mean age was 35.8 ± 13.9 years. Burns were mainly flame-related (90%). Neck extension improved significantly: mentosternal angle increased from $84.5 \pm 12.12^\circ$ preoperatively to $114.0 \pm 14.49^\circ$ postoperatively ($P = 0.001$), and mentosternal distance increased from 11.2 ± 1.69 cm to 15.2 ± 2.1 cm ($P = 0.001$). Satisfaction was 7–8 in 70%, 9–10 in 20%, and 5–6 in 10%; no patients reported ≤ 4 .

Conclusion: Multiple small Y-V advancement flaps performed under local anesthesia appear to be an effective reconstructive option for mild-to-moderate post-burn neck contracture/bands, providing meaningful functional improvement and cosmetically preferred local-tissue reconstruction with high patient satisfaction. Larger comparative studies with longer follow-up are warranted...

Keywords: Burns; Neck; Contracture; advancement flap; Y-V flap; Surgical Flaps; Reconstructive Surgical Procedures; Range of Motion...

How to cite this article: Agha SA, Hassan JA., A New Technique for Releasing Neck Contracture and bands by Multiple Y-V Advancement Flap. Int J Drug Deliv Technol.. 2026;16(80s): 824-831; DOI: 10.25258/ijddt.16.80s.97

Source of support: Nil.

Conflict of interest: Nil.

INTRODUCTION

Burn injuries represent a major global public health problem; according to WHO estimates, they cause approximately 180,000 deaths annually, with the majority occurring in low- and middle-income countries (LMICs) (1). Non-fatal burns result in disfigurement, disability, and prolonged hospitalization, with much of this morbidity attributable to scar formation, contracture, and associated psychological sequelae (2).

Post-burn scar contracture (BSC) represents one of the most functionally devastating sequelae of burn injury. A contracture is defined as the pathological result of excessive scarring and ongoing scar contraction, leading to loss of range of motion (ROM) over joint areas and limiting daily functioning (3). Post-burn neck contracture is one of the most common burn sequelae and produces a combined burden of aesthetic disfigurement, functional limitation, psychological disturbance, and social problems (4).

Anterior and lateral neck contractures are among the most common sequelae of burn injuries; they restrict ROM, complicate airway management, and create significant cosmetic deformities (5). The neck carries the highest incidence and poorest BSC outcomes due to its thin and mobile tissue characteristics, and it has been identified as the body region most affected by contracture-related ROM limitation (6). Delayed burn wound healing resulting from inadequate initial treatment of deep partial- and full-thickness burns, combined with habitual use of a pillow during the post-burn recovery phase, frequently leads to anterior neck contracture (7). Neck contracture may cause variable deformity of the lower lip, chin, neck, and upper chest in addition to movement limitation (8).

With respect to prior evidence, Mabrouk et al. prospectively evaluated 70 patients with post-burn cervical contracture and reported that the most common grade was moderate contracture, with broad scars comprising the most frequent pattern, and that recurrence of neck contracture increased

notably with release by skin grafts (28.6%) (9). Similarly, a single-center retrospective cohort by Arellano et al. reported that among 51 patients treated for neck burns over a 14-year period, 39.2% developed a neck BSC, with a total of 45 surgical release procedures performed and patients undergoing a mean of 3.4 surgeries (6).

Multiple reconstructive strategies have been described for cervical BSC release, including skin grafting, pedicle flaps with or without tissue expansion, and free flaps (7). Traditional methods, however, are subject to variable outcomes, residual neck tightness, recurrence, and suboptimal cosmetic appearance. Among local tissue rearrangement techniques, the Y-V advancement flap offers a geometrically elegant approach to contracture release by converting a Y-shaped incision into a V closure, thereby lengthening the axis of restriction without requiring distant tissue harvest (5, 10). The Y-V advancement technique functions by advancing adjacent tissues to fill small- to medium-sized cutaneous defects, most often resulting from contractures and fibrotic scar bands (10).

The application of multiple Y-V advancement flaps as a primary technique for cervical contracture release, redistributing tension across several small advancement units simultaneously, has not been systematically evaluated in the published literature, underscoring the novelty and clinical necessity of the present study. Therefore, this study aimed to assess the clinical utility of a new technique of multiple Y-V advancement flaps for releasing post burn neck contracture and restoring cervical mobility.

Methods and Materials

Study design and setting

A retrospective observational case-series was performed at the Sulaimani Hospital for Burn and Reconstructive Surgeries (Sulaimaniyah, Iraq). The study evaluated functional and patient-reported outcomes following release of post-burn cervical contracture and fibrotic neck bands using multiple Y-V advancement flap technique performed under local anesthesia.

Study size and study period

A total of 10 patients ($n = 10$) who underwent operative contracture release with multiple Y-V advancement flaps were included. Cases were identified from institutional surgical records across multiple years (1983–2025).

Patients were eligible if they met all of the following criteria: History of burn injury with clinically significant anterior neck contracture and/or tight cervical scar bands limiting extension; Contracture severity classified as mild to moderate (by treating surgeon clinical assessment and OPD documentation); Operative management using multiple micro Y-V advancement flaps as the primary reconstructive method for neck release; Availability of OPD charted pre- and post-operative measurements of neck extension (mentosternal angle and/or mentosternal distance) and documentation of patient satisfaction. Patients were excluded if: Severe or diffuse neck contracture/broad scar

contracture requiring larger resurfacing procedures (e.g., skin grafting, regional or free flaps); Operative notes did not specify the flap design and orientation; Outcome measurements were missing; or Follow-up documentation was insufficient to determine post-operative functional status.

Data collection

All study variables (functional measurements, satisfaction scoring, and follow-up documentation) were obtained and gathered from the outpatient department (OPD) records. Data were obtained through retrospective chart review using a structured abstraction sheet.

For each patient, demographic and burn-related information was recorded, including age at the time of the index operation, sex, burn etiology (flame vs chemical), and the estimated %TBSA as documented by the burn team. Surgical history was abstracted, focusing on the number of prior reconstructive operations.

Preoperative clinical assessment included documenting scar pattern (linear/band/broad) and contracture degree (mild/moderate/severe), and noting airway-relevant clinical measures when applicable (e.g., chin–thyroid prominence distance), even though the procedure was performed under local anesthesia.

Outcomes

Objective functional outcomes reflected maximal neck extension and were documented in OPD:

The full-extension mentosternal angle (degrees): recorded with the patient upright, actively extending the neck to the maximum tolerable position; angle documented using a handheld goniometric approach.

The full-extension mentosternal distance (cm): linear measurement from the menton to the suprasternal notch using a flexible measuring tape during maximal extension. For analysis, the pre-operative value was defined as the last measurement recorded before surgery, and the post-operative value was taken from the most recent OPD follow-up entry after wound healing.

Patient-reported satisfaction was extracted from OPD follow-up notes using a 0–10 numeric rating scale. Patients were asked for overall satisfaction incorporating both functional improvement (neck movement) and cosmetic appearance (scar/band visibility and neck contour). Scores were grouped into 0–2, 3–4, 5–6, 7–8, and 9–10 categories. Safety data were captured by screening postoperative records for documented complications (infection, wound dehiscence, delayed healing, hypertrophic scar aggravation, flap congestion/necrosis, or recurrence).

Clinical photographs: Standardized pre- and post-operative photographs were obtained in OPD for clinical documentation in selected cases, with patient consent, and presented as case figures (Methods/Results) to demonstrate functional and cosmetic change (see Figure 1-3).



Figure 1. Case one**Figure 2. Case two.**





Figure 3. Case three.

Surgical technique

The procedure was performed with the patient supine and the neck prepared in sterile fashion. Local anesthesia was used (local infiltration along the planned incisions), allowing the procedure to be completed without general anesthesia or intubation.

Design and orientation: Multiple small Y-shaped markings were drawn serially along the tight anterior cervical band(s). Each Y was oriented perpendicular to the vertical neck band (i.e., the central limb crosses the band), which facilitates transverse recruitment and lengthening along the axis of restriction. The length of each Y-to-V advancement was micro-designed: the limbs were typically < 1 cm (≤ 10 mm), enabling multiple releases with minimal additional scarring.

Release and advancement: Under LA, the scar band was incised at each Y in a stepwise fashion until satisfactory extension was achieved without undue tension. Each micro flap was elevated in the subcutaneous plane with a broad dermal-subdermal base; undermining was kept conservative due to scar vascularity. The central limb of each Y was advanced and closed as a V, providing incremental lengthening and distributing tension across multiple small units rather than one large high-tension closure.

Closure: Hemostasis was secured. Wounds were closed with sutures per surgeon preference and tissue condition. Absorbable sutures were not used for all patients; deep

sutures were applied selectively, and skin closure was commonly performed using non-absorbable interrupted sutures. A non-adherent dressing was applied.

Postoperative care: Follow-up in OPD focused on wound healing, scar care, and maintenance of neck extension exercises. Patients were advised on posture/extension practices to reduce the risk of recurrence.

Statistical analysis

Data were entered into and analyzed with IBM SPSS Statistics for Windows, Version 28.0 (IBM Corp., Armonk, NY). Continuous variables were summarized as mean $\pm$ SD, while categorical variables were reported as frequency and percentage. Pre- versus post-operative changes in the full-extension mentosternal angle (degrees) and mentosternal distance (cm) were evaluated using a paired-samples t-test. All tests were two-tailed, and $P \leq 0.05$ was considered statistically significant.

Ethical considerations

This study was conducted as a chart-based outcomes assessment. Informed consent was obtained from all patients for the surgical procedure and for the use of their clinical information in follow-up and outcomes evaluation in accordance with institutional policy.

Results

The study included a total of 10 patients with a mean age of 35.8 ± 13.90 years. All patients were female (100%). The timing of surgery spanned multiple years, with 1 (10%) patient in 1983, 2 (20%) patients in 2017, 1 (10%) patient

in 2020, 3 (30%) patients in 2022, 2 (20%) patients in 2023, and 1 (10%) patient in 2025. (Table 1)

Table 1. Demographic Characteristics of Patients (n = 10).

Variable		No.	%
Age		35.80 ± 13.895	
Sex	Female	10	100%
	Male	-	-
Time of surgery (year)	1983	1	10%
	2017	2	20%
	2020	1	10%
	2022	3	30%
	2023	2	20%
	2025	1	10%
Total		10	100%

The majority of burns were caused by flame injuries 9 (90%) patients, while chemical burns accounted for 1 (10%) patient. The percentage of total body surface area affected by burns varied across patients: 10% (1 patient), 23% (1 patient), 29% (1 patient), 32% (1 patient), 38% (1 patient), 39% (1 patient), 40% (1 patient), 57% (1 patient), 63% (1 patient), and 70% (1 patient).

Regarding surgical history, 3 (30%) patients underwent 2 previous surgeries, 4 (40%) patients had 3 surgeries, 2 (20%) patients had 4 surgeries, and 1 (10%) patient underwent 5 surgeries. The majority of patients 9 (90%) patients had their last surgery in 2025, while 1 (10%) patient had the last surgery in 2024 (Table 2).

Table 2. Burn Characteristics and Surgical History in patients.

Variable		No.	%
Cause of burn	Flame	9	90%
	Chemical	1	10%
% of burn	10%	1	10%
	23%	1	10%
	29%	1	10%
	32%	1	10%
	38%	1	10%
	39%	1	10%
	40%	1	10%
	57%	1	10%
	63%	1	10%
	70%	1	10%
Number of surgeries	2	3	30%
	3	4	40%
	4	2	20%
	5	1	10%
Time of the last surgery	2024	1	10%
	2025	9	90%
Total		10	100%

The full-extension mentosternal angle showed a significant increase post-operatively. Measured in degrees, the pre-operative mean was 84.50 ± 12.12 , which increased to 114.00 ± 14.49 post-operatively ($P \leq 0.001$). When measured in centimeters, the mean pre-operative distance was 11.20 ± 1.69 cm, increasing to 15.20 ± 2.10 cm post-operatively ($P \leq 0.001$).

Table 3. Pre- and Post-Operative Surgical Outcomes in patients.

Surgery	Pre-Operative	Post Operative	P-value*
Full-extension mentosternal angle (Degree)	84.50 ± 12.122	114.00 ± 14.491	0.001
Full-extension mentosternal angle (cm)	11.20 ± 1.687	15.20 ± 2.098	0.001

*P-value based on Paired t-test

Patient-reported satisfaction was recorded on a 0–10 scale. No patients reported scores of 0–2 (Very Dissatisfied) or 3–4 (Dissatisfied). One (10%) patient scored 5–6 (Natural), 7 (70%) patients scored 7–8 (Satisfied), and 2 (20%) patients scored 9–10 (Very Satisfied) (Figure 4).

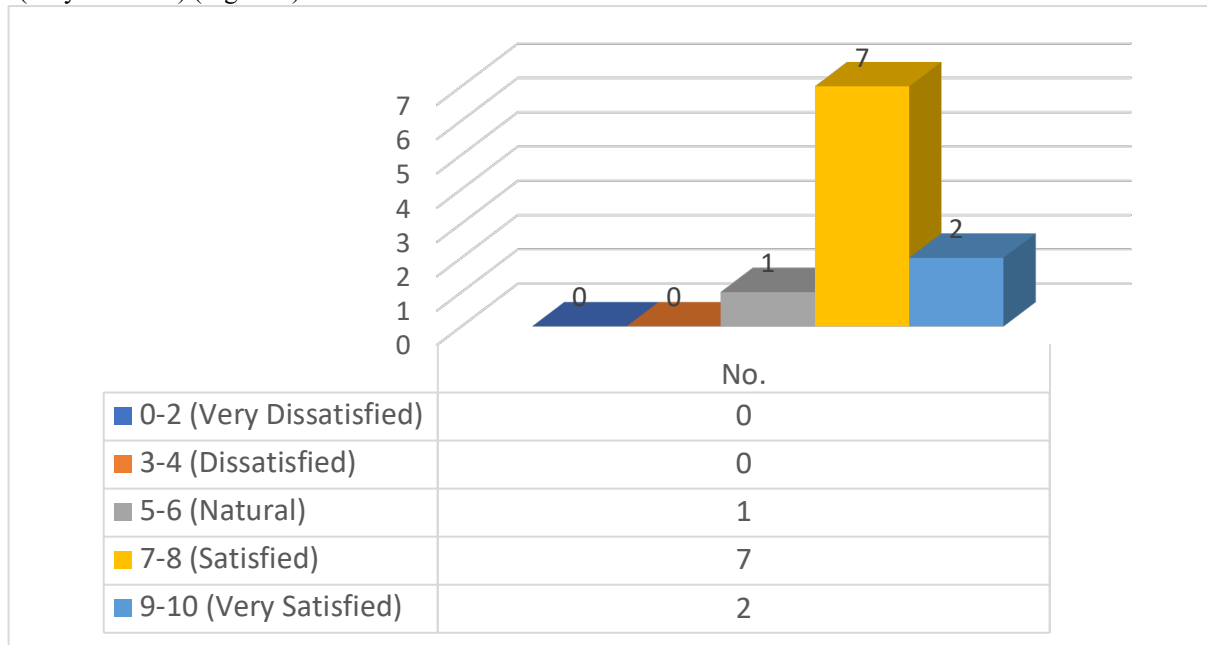


Figure 4. Patient Satisfaction Scores.

Discussion

Cutaneous contractures and fibrotic cervical bands following burn injury are among the most challenging sequelae in plastic and reconstructive surgery (11). These complications not only severely restrict neck range of motion and disrupt essential functions such as swallowing, speech, and mastication, but also create persistent traction on adjacent tissues, leading to long term facial distortion and disfiguring scars (12). Achieving complete release of these bands requires a precise understanding of the biomechanical behavior of scarred skin and the selection of a surgical strategy that restores surface area along natural skin tension lines without imposing excessive vascular compromise (13).

The present investigation clinically evaluated the efficacy and therapeutic outcomes of the multiple Y V advancement flap technique for releasing burn related cervical contractures and tight neck bands in patients undergoing reconstructive surgery. Clinical findings from 10 female patients, most of whom sustained flame burns and had undergone 2 to 5 prior reconstructive operations, indicated strong and statistically significant improvements in neck mobility and anatomic indices. Specifically, the mean mentosternal angle at maximal extension increased from

84.50 ± 12.12 degrees preoperatively to 114.00 ± 14.49 degrees postoperatively. In addition, the mean chin to sternum distance increased by approximately 4 cm, rising from 11.20 ± 1.69 cm to 15.20 ± 2.10 cm. Patient reported outcomes were also highly favorable, with 90 percent rating satisfaction as good to excellent, corresponding to scores of 7 to 10 out of 10, and no cases of dissatisfaction or severe cutaneous complications were documented.

Evaluation of burn etiology showed that 90 percent of cases were due to flame exposure and 10 percent were caused by chemical agents. Clinically, direct flame burns often produce deeper thermal injury and promote intense inflammatory responses, which increases the likelihood of rigid hypertrophic scarring and thick contracture bands (14, 15). Management becomes more complex when repeated reconstructive interventions are considered. All patients in this cohort had previously undergone 2 to 5 unsuccessful operations, and most had received three prior reconstructive procedures. This high frequency of earlier failures underscores the recurrent nature of cervical contractures and suggests limitations of conventional approaches such as skin grafting or simple Z plasty in maintaining durable neck release (16).

These results are consistent with existing evidence regarding the value of local flaps for reconstruction of neck

contracture after burn injury. In review studies by Rajabi et al. (17), and Annacontini et al. (18), flap based reconstruction has generally been associated with reliable gains in mobility, high patient satisfaction, and relatively low recurrence rates, although heterogeneity in reported outcomes limits direct comparison across studies. Similarly, Shulkin et al. described this general approach as effective for neck contracture release without the need for grafting (19). Therefore, the present findings support the premise that local advancement flaps can perform well in cervical reconstruction, particularly in scarred tissue.

When compared with alternative methods, this technique offers notable advantages over skin grafting. Although grafts may be practical in selected settings, they are more susceptible to secondary contraction and often yield inferior aesthetic quality in neck reconstruction. In contrast, local flaps such as the multiple Y-V advancement flap rely on adjacent tissue with preserved perfusion, which may provide greater long term stability (20, 21). This consideration is particularly important for patients with a history of multiple prior operations, because surrounding cervical tissues are typically less pliable and reconstructive challenges are amplified.

An additional strength of this study is the clinical severity of the included cases. Most patients had undergone multiple prior procedures, and most injuries were flame related, which is commonly associated with broader and more complex scarring. Despite these challenges, the cohort demonstrated clinically meaningful functional improvement and high satisfaction, suggesting that the technique may be applicable not only to straightforward cases but also to complex patients with repeated prior surgery (10).

Nevertheless, the findings should be interpreted cautiously. First, the sample size was small, which limits generalizability. Second, the study lacked a comparator group, so definitive superiority over techniques such as supraclavicular flap reconstruction, Z plasty, or other local flap designs cannot be established. Third, long term recurrence, scar quality, and standardized aesthetic assessments were not reported. Consequently, these results are best viewed as preliminary and practice informing evidence rather than definitive proof of comparative effectiveness.

In contrast, the study also has several important strengths. The use of a single, well defined, and relatively straightforward technique enhances practical applicability for reconstructive surgeons. In addition, the concurrent assessment of functional outcomes and patient satisfaction provides a more comprehensive understanding of treatment effect. Finally, the cohort consisted of clinically complex cases, which increases the practical value of the findings. Overall, the multiple Y V advancement flap may be considered an effective, accessible, and relatively less invasive option for management of cervical contracture.

Conclusions

The multiple Y-V advancement flap appears to be an effective method for releasing post burn neck contracture and scar bands in burn patients, with the potential to produce clinically meaningful improvement in neck range

of motion and patient satisfaction. These findings are consistent with the existing literature supporting the utility of flap based reconstruction for post burn cervical contracture and suggest that this technique may be a reliable option, particularly in complex cases. Nonetheless, future studies with larger samples, comparative designs, and long term follow up are required to clarify its relative role among established reconstructive approaches.

Acknowledgments: We extend our heartfelt appreciation to everybody who dedicated their time, effort, and skill to ensure the success of this study. We recognize the utilization of artificial intelligence techniques for language editing and grammatical verification in article preparation; nonetheless, all scientific content, data interpretation, and final findings remain the exclusive responsibility of the authors.

Conflict of interest: All authors assert the absence of any conflict of interest.

Data availability: The study data can be obtained from the corresponding author upon a reasonable request.

Authors' contributions: Each author made an equal contribution to this research work.

Funding: Not applicable..

.

REFERENCE

1. Jeschke MG, van Baar ME, Choudhry MA, Chung KK, Gibran NS, Logsetty S. Burn injury. *Nature reviews Disease primers*. 2020;6(1):11. <https://doi.org/10.1038/s41572-020-0145-5>
2. Yin B, He Y, Zhang Z, Cheng X, Bao W, Li S, et al. Global burden of burns and its association with socioeconomic development status, 1990–2019. *Burns*. 2024;50(2):321-74. <https://doi.org/10.1016/j.burns.2023.02.007>
3. Rai P, Nazar R, Ahmed J, Ahmed M, Khan SJJoH, Wellness, Research C. Prevalence of Post-Burn Contractures and Their Impact on Functional Activities among Burn Survivors: A Cross-Sectional Study. *Journal of Health, Wellness and Community Research*. 2026;4(5):e1339-e.
4. Tank PA, Sayra NS, Malav P, Tank NAJIJoM, Research P. Surgical Outcomes in Post-Burn Neck Contractures: A Prospective Study of 20 Patients in Ahmedabad. *International Journal of Medical and Pharmaceutical Research*. 2026;7:207-14. <https://zenodo.org/records/19327372>
5. Ferland-Caron G, Kwan PO, Tredget EE. Free Tissue Transfer in the Reconstruction of Neck Contractures after Burn Injury: A Case Series. *European burn journal*. 2023;4(2):248-58. <https://doi.org/10.3390/ejb4020022>
6. Arellano JA, Jeong T, Alessandri-Bonetti M, Pandya S, Liu H, Stofman GM, et al. 797 The Development

- and Management of Neck Burn Scar Contracture Recurrence: A Single-Center Retrospective Cohort Study. *Journal of Burn Care & Research: Official Publication of the American Burn Association*. 2024;45(1):259.
7. Ahmad I, Karad S, Khurram MF, Ali SS, Tripathi S, Chaudhury G. Postburn neck contracture reconstruction by interval skin grafting. *Indian Journal of Burns*. 2022;30(1):39-44. https://doi.org/10.4103/ijb.ijb_4_22
8. Wang Y, Mao S, Wu J, Yang S, Wang R, Zhang Y, et al. Custom-made cervical orthosis for pediatric neck scar contracture: a self-controlled case series. *BMC pediatrics*. 2026;26(1):360. <https://doi.org/10.1186/s12887-026-06718-5>
9. Mabrouk A, Hammad MR, Mabrouk A, Badawy MS. Post burn contracted neck: Experience in Ain Shams burn center. *Burns Open*. 2024;8(1):39-42. <https://doi.org/10.1016/j.burnso.2023.12.003>
10. Jahanabadi S, Bakhshaeekia A, Rahbar R, Sheikhi A, Farhadi M, Hashemi SS. Local Flap Reconstruction of Burn Contractures in Extremities and Neck: A Nine-Year Experience with Long-Term Outcome Evaluation in Southwestern Iran. *World J Plast Surg*. 2023;12(2):47-56. <https://doi.org/10.52547/wjps.12.2.47>
11. Jeong T, Alessandri-Bonetti M, Pandya S, Liu H, Stofman GM, Egro FM. The Development and Management of Neck Burn Scar Contracture Recurrence: A Single-Center Retrospective Cohort Study. *Ann Plast Surg*. 2024;92(4S Suppl 2):S142-s5. <https://doi.org/10.1097/sap.0000000000003854>
12. Muhammad Mudassir M, Adeeba A, Shadman M, Fahimullah K, Shahzad, Adil R, et al. Post-burn neck contractures: Surgical treatment and long-term outcomes. *Journal of Gandhara Medical and Dental Science*. 2026;13(1):32-6. <https://doi.org/10.37762/jgmids.13-1.709>
13. Hayashida K, Akita S. Surgical treatment algorithms for post-burn contractures. *Burns & Trauma*. 2017;5(1):1-4. <https://doi.org/10.1186/s41038-017-0074-z>
14. Noorbakhsh SI, Bonar EM, Polinski R, Amin MS. Educational Case: Burn Injury-Pathophysiology, Classification, and Treatment. *Acad Pathol*. 2021;8:23742895211057239. <https://doi.org/10.1177/23742895211057239>
15. Faour S, Farahat M, Aijaz A, Jeschke MG. Fibrosis in burns: an overview of mechanisms and therapies. *Am J Physiol Cell Physiol*. 2023;325(6):C1545-c57. <https://doi.org/10.1152/ajpcell.00254.2023>
16. Arellano J, Liu H, Jeong T, Reis A, Kim J, Teunis T, et al. 542 Hand Burn Contracture Recurrence: A Systematic Review and Meta-analysis. *J Burn Care Res*. 2025;46(1):S132-3.
17. Rajabi MT, Rafizadeh SM, Sadeghi R, Poshtdar S, Aghajani AH, Hosseini SS, et al. A comprehensive evaluation of flap reconstruction in periocular repair: outcomes, complications, and future directions. *BMC Ophthalmol*. 2025;25(1):653. <https://doi.org/10.1186/s12886-025-04512-y>
18. Annacontini L, Cagiano L, Verdura V, Zupo R, Castellana F, Parisi D, et al. Functional and clinical outcomes of propeller flaps in lower extremity reconstruction: A systematic review. *JPRAS Open*. 2026;50:105-47. <https://doi.org/10.1016/j.jpra.2026.03.009>
19. Shulkin A, Katz A, Bouhadana G, Izadpanah A, Danino AM, Efanov JI. Flap reconstruction of post-burn neck contractures: A systematic review. *Burns*. 2025;51(9):107745. <https://doi.org/10.1016/j.burns.2025.107745>
20. Saaiq M. Supraclavicular Artery Flap versus Skin Graft: Which Is a Better Reconstructive Tool for Managing Post-Burn Contractures in the Neck. *World J Plast Surg*. 2021;10(1):15-21. <https://doi.org/10.29252/wjps.10.1.15>
21. Raborn LN, Janis JE. Prevention and Treatment of Burn Scar Contracture: A Practical Review. *Plast Reconstr Surg Glob Open*. 2024;12(1):e5333. <https://doi.org/10.1097/gox.0000000000005333>