

# To Evaluate the Ideal Surgical Method for Management of Post Burn Scar Contracture of Neck: A Hospital Based Study

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## ABSTRACT

**Background:** A neck contracture may result in severe impairment of function and deterioration of esthetics. The best way is to avoid a severe burn neck scar contracture by early treatment and mitigations. The present study was conducted to evaluate the ideal surgical method for management of post burn scar contracture of neck.

**Materials and Methods:** This prospective study was conducted among patients who were diagnosed as having post burn scar contracture of neck by clinical examination. Factors Assessed were: Type of Scar Contracture and donor thigh for scarring and previous grafted area is noted. Statistical analysis was performed with IBM SPSS Statistics (International Business Machines Corporation (IBM), New York, USA), version 22 for Windows.

**Results:** In the present study majority of the patients were female, 67% of the total 60 patients, Male patients were only 33%. The majority of patients 36.66% were belonging to the type B scar, followed by type C 26.66%. In this study, contracture release followed by skin grafting was done in 71.66% patients, contracture release and flap cover were done in 13.33% cases and multiple z plasty in 15% patients.

**Conclusion:** This study concluded that in majority of patients for management of post burn scar contracture of neck contracture release followed by skin grafting was done.


**Keywords:** Contracture Release, Skin Grafting, Flap Cover, Multiple Z Plasty.

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## INTRODUCTION

Post burn neck contracture consequences are considered of the greatest challenges in reconstructive surgery. This is because the deformities resulting from burn insult affect the neck region altering the normal position of the head during flexion, extension or lateral rotation position. In addition to the arousal of abnormal skin portions and hypertrophic scars in the head and neck areas either in the static or dynamic status of the head.<sup>1</sup> Contraction is the active biologic component of wound healing that decreases the dimension of the involved connective tissue. Contracture is the end result of the process of contraction. The process of contraction may lead to severe functional and aesthetically incapacitating contractures such as burn scar contractures. Post burn contractures are perhaps the most dreaded and distressing morbidity inpatients surviving major burns.<sup>2</sup> Deep partial-thickness and full-thickness burns that are not treated with early excision and grafting can be disabling, as these deep injuries often lead to

burn scar contractures unless provided with adequate positioning and splinting. Burn scar contractures are severely disfiguring, painful, and itching. As such thing, patients with burn scar contractures which interfere with activities of daily living are often marginalized and experience difficulties in receiving education and securing work.<sup>3</sup>

Post burn neck contractures not only affect the movements of the neck, but also can affect the function of the lower face as well as result in possible tracheal alteration and distortion of the cervical spine. As these contractures cause major functional and cosmetic problems with resultant economic and psychosocial implications, operative correction is generally recommended, particularly in children in whom they can cause growth imbalance in the head and neck area.<sup>4</sup> The present study was conducted to evaluate the ideal surgical method for management of post burn scar contracture of neck.

## MATERIALS AND METHODS

This prospective study was conducted among patients who were diagnosed as having post burn scar contracture of neck by clinical examination. Before the commencement of the study ethical approval was taken from the Ethical committee of the institute and informed consent was obtained from the patients after explaining the nature of the disease and various modalities of treatment available.

Patients with burns of minimum 6 months duration, more than 18 yrs age groups, both sex groups, Contractures secondary to thermal and chemical burns, associated hypertrophic scar and keloid were included in the study. Patients with acute burns, associated post traumatic/post inflammatory contractures, Contractures secondary to electrical burns were excluded from the study. Factors Assessed were: Type of Scar Contracture and donor thigh for scarring and previous grafted area is noted. Statistical analysis was performed with IBM SPSS Statistics (International Business Machines Corporation (IBM), New York, USA), version 22 for Windows.

## RESULTS

In the present study; majority of the patients were female, 67% of the total 60 patients, Male patients were only 33%. Type of Scar Contracture were Linear Scar, Broad Scar. broad scar was of following types: Type A i.e. Anterior or any one of the lateral surfaces is involved, Type B i.e. Anterior and either one of the lateral sides is involved, Type C i.e. Anterior and both the lateral sides are involved. The majority of patients 36.66% were belonging to the type B scar, followed by type C 26.66%. In this study, contracture release followed by skin grafting was done in 71.66% patients, contracture release and flap cover were done in 13.33% cases and multiple z plasty in 15% patients.

**Table 1: Distribution of type of scars**

Type of Scar	N(%)
Linear Scar	8(13.33%)
<b>Broad Scar</b>	
Type A	14(23.33%)
Type B	22(36.66%)
Type C	16(26.66%)
<b>Total</b>	60(100%)

**Table 2: Distribution of procedures done**

Procedures	N(%)
<b>Contracture release followed by skin grafting</b>	43(71.66%)
<b>Contracture release and flap cover</b>	8(13.33%)
<b>Multiple z plasty</b>	9(15%)
<b>Total</b>	60(100%)

## DISCUSSION

The main causes of burn contractures (especially joint contractures) are mostly the inappropriate initial burn management and inadequate physical therapy.<sup>5</sup> Early aggressive physical therapy and splinting are the fundamental parts of the burn management. In the literature, early physical therapy and

splinting have been shown as an effective method to decrease the incidence of burn contracture releasing operation.<sup>6</sup>

In adult extensive burns, the neck might be less attentive as initial treatment is attempted in resuscitation and much easier areas, which may result in the delayed start of treatment and lead to severe contracture although the incidence is lower compared to other joints in extremities.<sup>7</sup> The most important strategy is to avoid the severe neck contracture sequelae by careful treatment in a timely manner. In partial thickness burns, growth factor treatment leads to faster wound closure, less scarring and thus better quality of wound healing.<sup>8-10</sup>

In the present study majority of the patients were female, 67% of the total 60 patients, Male patients were only 33%. The majority of patients 36.66% were belonging to the type B scar, followed by type C 26.66%. In this study, contracture release followed by skin grafting was done in 71.66% patients, contracture release and flap cover were done in 13.33% cases and multiple z plasty in 15% patients.

Greenhalgh et al. reported 62% success rate with skin grafting.<sup>11</sup> Reconstructive principles must be obeyed strictly in burn surgery. The chosen method should be the simplest method to obtain the optimal results.<sup>12</sup>

Skin grafts, local advancement flaps (Z-plasty, K-plasty) or their combination, distant flap, and free flaps are all used to release burn contractures.<sup>13</sup>

In addition, the algorithm system introduced a variety of surgical solutions that were not suggested in Onah and Makboul et al. classifications such as axial flaps from surrounding healthy areas (eg. Supraclavicular flaps) or from distant areas (eg. Latissimus dorsi flaps) in addition to multiple z and local flaps.<sup>14,15</sup>

## CONCLUSION

This study concluded that in majority of patients for management of post burn scar contracture of neck contracture release followed by skin grafting was done.

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