

## Original Article

# MANAGING POSTBURN NECK CONTRACTURES IN PRIVATE PRACTICE

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**Objective:** Postburn contractures are well known complication. The cervical region is prone to scar contractures, traction forces which may pull the chin, cheeks, and lower lip caudally. The postburn contractures cause major functional and aesthetic problems, so early operative correction is generally recommended. Many surgical options have been proposed including skin grafts, local flaps or free flaps. The purpose of this study was to present the experience of management of postburn contracture by the different surgical options in private setup.

**Material & Methods:** This study was conducted in a private setup from January 2006 to December 2007. 11 patients presenting with postburn neck contractures were included. The surgeries were performed under general anaesthesia with nasal intubation. The selection of the surgical procedure was done according to individual case. After surgery, the neck was kept extended using cervical splint (Watusi splint).

**Results:** The male to female ratio was 1:1.2. The mean age in male patients was 31.2 years and 26.5 years in females. For mild to moderate cases, multiple Z-plasties, skin graft and tissue expansion were used. For more severe cases, tissue expansion with local flaps and regional flaps were used. Z-plasties were used in 27.3% cases. Tissue expansion was performed in 36.4% cases. Supra clavicular flap was used for defect closure in 18.2% of the patients. The range of motion was found to be satisfactory in most of the cases.

**Conclusion:** The skin grafts provide a good coverage option after the release of a postburn neck contracture. It can also be used as bridging operation in staged surgeries. Local flaps provide good colour and texture match.

**Keywords:** Post burn neck contractures, Skin grafts, Neck surgery

## Introduction

Postburn contractures are well known complication. The cervical region is functionally and anatomically designed to achieve a maximum range in three dimensional motion.<sup>1</sup> Furthermore, the cervical region functions as a medium to interact with human society. The cervical region is prone to scar contractures; the traction forces caused by burn scar contracture may pull the chin, cheeks, and lower lip caudally. This results in incomplete oral occlusion and cicatricial ectropion and distortion of the cervical spine.<sup>2</sup> In the growing age, scar contracture in the cervical region impairs mandibular growth.

Many surgical options have been used to correct the contractures including skin grafts, local flaps with or without the tissue expansion or free flaps.<sup>3-6</sup> For planning the operation, the surgeon must be aware of the three dimensional extension of the scar, including the texture of the wound area such as the platysma, cervical fascias, muscles, nerves, blood vessels and trachea.

The purpose of this study was to present the experience of management of postburn contracture by the different surgical options in private setup.

## Material & Methods

This study was conducted in a private setup from January 2006 to December 2007. All the patients presenting with postburn neck contractures were included in the study. The age, sex, severity/extent of the contracture was noted. The surgeries were performed under general anaesthesia with nasal intubation. The selection of the surgical procedure was done according to individual case. After surgery, the neck was kept extended using cervical splint (Watusi splint). The splint was continued weeks to months later on postoperatively. In few cases, silicone gel sheeting was used inside the splint. The range of motion after the procedures was noted. Any complications were also noted.

## Results

A total of 11 patients were included in the study. The male to female ratio was 1:1.2. The mean age in male patients was 31.2 years (range 24-38 years) and 26.5 years (range 19-34 years) in females. Majority of the patients had mild to moderate neck contractures. For mild to moderate cases, multiple Z-plasties, skin graft and tissue expansion were used. For more severe

cases, tissue expansion with local flaps and regional flaps were used. Z-plasties were used in 27.3% cases. Tissue expansion was performed in 36.4% cases (Table-1). Supraclavicular flap was used for defect closure in 18.2% of the patients.

**Table-1:** Operative modalities used (n=11).

Operations	No. of Patients	Percentage
Z-Plasties	03	27.3
Tissue expansion	04	36.4
Supraclavicular flap	02	18.2
Skin Grafting	02	18.2

The postoperative complications were few. Partial loss of graft was seen in one patient only. The partial flap necrosis was seen in one patient whereas epidermolysis of the terminal part of flap was also seen in one patient. The range of motion of the neck was also checked preoperatively and postoperatively. The photographic record was also used to compare the range of motion which was found to be satisfactory in most of the cases.

**Case 1:**

A 28 years old patient who got burns during the



**Fig-1a:** Extensive preoperative postburn contracture



**Fig-1b:** After tissue expansion

childhood had involvement of shoulders, chest, back and both forearms. No donor area for local flap was available (Fig. 1a). Tissue expansion was planned and the contracture was released and covered with local flaps (Fig.1b).

**Case 2:**

A 34 years old patient had postburn neck contracture



**Fig 2a:** Preoperative postburn contracture



**Fig 2b:** Postoperative after supraclavicular flap

for 6 years (**Fig.2a**). Supraclavicular flap was performed. The postoperative period was satisfactory with almost normal range of motion (**Fig.2b**).

## Discussion

Aesthetic restoration after postburn facial and cervical scar contractures represents a challenge in the field of plastic and reconstructive surgery. The medical objectives for surgical treatment of postburn neck contractures are releasing the scar, restoring cosmesis, and avoiding recurrent scar formation. Burn scar contracture presents a unique set of problems. The challenge lies in the restoration of form and function of this region. The skin of neck is thin and pliable. In postburn neck contractures, the operation should be as early as possible to avoid difficult intubation maneuvers due to tracheal distortion. Early operation is more crucial for children, since scar contractures of long duration cause growth imbalance in the head and neck area.<sup>2</sup> Skin grafts present the simplest option. All the scar/contracture area should be excised. The un-meshed relatively moderate thickness sheet graft is the best option. But after the graft take, the splint has to be used postoperatively. Moreover, these grafts tend to hyper pigment. Only two patients (18.2%) were treated with skin graft in the present series. But in a study by Baber et al, 86.7% of the patients were treated with skin graft.<sup>7</sup>

Local flaps have the advantage of colour and texture match but most often, they are not available because of scarring of the neighboring tissue. For small contractures like bands can be treated by multiple Z-plasties. For larger defects, tissue expansion is another option. But it has the disadvantage of being a two stage procedure.

In the series by Baber et al tissue expansion was used for head and neck postburn deformities.<sup>8</sup> The expanded skin is used to reconstruct the defect

caused by the excision of the scar tissue. Various local flaps have been used for reconstruction of postburn neck contractures. It includes trapezius musculocutaneous flap, supraclavicular fasciocutaneous flap, thoracodorsal artery flap.<sup>9-12</sup> Musculocutaneous flaps are bulky and need subsequent secondary operative procedures. Local fasciocutaneous flaps provide good colour and texture match. Free flaps have also been used, e.g., radial artery forearm flap, latissimus dorsi flap, scapular flap.<sup>13-15</sup> We used supraclavicular flap in 18.2% of the cases. Both of these patients were females. A larger series by Nobert et al described 22 fasciocutaneous supracalvicular island flaps in the paediatric patients (age range 9-17 years) whereas flaps were done only in adults in the present series.<sup>16</sup> Similarly a study by Chandini et al presented a large series of 96 patients of severe postburn neck contractures with no contracture at the follow up of 1 year.<sup>17</sup> Mean age of the patients in the present study was 31.2 years for males and 26.5 years for females which is younger to the patients in the study by Mun et al.<sup>12</sup>

There were only few complications. It included partial loss of skin graft in one case. The wound was re-grafted later on. There was a partial loss of skin flap rotated after tissue expansion. The tissue was excised and skin grafting was done later on. Partial epidermolysis of flap margin was noted in one case which was treated conservatively.

## Conclusion

The skin grafts provide the simplest reconstructive option but it has a few disadvantages like recurrence, hyper-pigmentation. The local flaps provide a good colour and texture match.

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