



Reconstruction of Post Thermal Burn Defect of Face and Shoulder

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Accepted on: 18-05-2015; Finalized on: 30-06-2015.

ABSTRACT

Burn is an injury to the body tissue by electricity, chemicals, thermal, steam and radiation. Burn of head and neck is most common due to thermal injury because of unprotected fire places and cooking. Females and children are mostly affected. Burn of head and neck region is more severe because of damage to eyes, ear and lungs. Post thermal burn is difficult to manage due to deep involvement of tissues. So the main aim of post thermal burn is to resurface the post thermal burn defect with different flaps according to the need of defect. Skin grafting replaces skin permanently lost in the burn injury. The appearance of grafted skin may vary; it sometimes blends into nearby healthy skin very well but sometimes a distinct mark is noticeable between the normal and grafted skin.

Keywords: Thermal burn, reconstruction, rehabilitation.

INTRODUCTION

Skin burns are one of the most common and devastating forms of trauma. Data from the American Burn Association show that over 450,000 people received treatment in the US in 2011 after burn injury.^{1,2}

Thermal burns are most common cause of burns. The activities involving fire, like ground level cooking, Diwali, faulty cooking gadget's, illegal cylinders are few causes of post thermal burn. So it should be carried out with utmost care & presence of mind. Burns is a three dimensional injury. Severity of burns depends upon quantum of tissue burnt and depth. The severity of the burns ranges from a mild first-degree burn, affecting only the epidermal layer, to second degree burns affecting both epidermis and dermis, and full-thickness burns requiring skin grafting³. Fourthdegree burn involves bones and muscles. Fourth-degree burns are extremely deep and cause injury to the muscle and bone. As the degree of burn increases the depth also increases and pain becomes very less.

Whole body surface area is taken as 100%. Proportion of surface burn is represented as % age. Rule of Nine is used for calculating the extent. Rule of Nine is not applicable in newborns, infants and children, where Lund & Browder chart is applicable.

Thrombosed capillaries and blood vessels are signs of full thickness burns. In burn there is gross changes seen at local site of burns and there are marked circulatory changes in the form of increased capillary permeability. This increased capillary permeability leads to hypovolemic shock which presents as tachycardia, dehydration, hypothermia, hypotension and oliguria.

Primary treatment of burns is fluid, fluid & fluid. Ringer lactate is the intravenous fluid of choice. All full thickness burns require excision of dead skin. Infection control is of utmost importance in burns. All burn wounds are sterile initially therefore all aseptic precautions should be followed in order to prevent cross infection from caregivers.

Early closure of burn wounds either by serial dressings or by excision & grafting is the definitive goal of treatment.

Case summary

In the routine OPD of SCB Medical College Cuttack. A male patient aged 22 years presented with a thermal burn involving face and shoulder due to fall of hot charcoals. The patient presented to us after a month of the incident.

On examination it was found that the right side of face was severely burnt and mandible was exposed and trismus was present.

The size of defect is around 15cm×10cm. The right shoulder is also burnt and size of defect is around 20 cm×10 cm.

The main aim is to cover the mandible, maxilla, and zygomatic bone along with shoulder joint The reconstruction of mouth and shoulder to be done in order to obtain the mobility and identity of the person.

Treatment Plan

The goals of burn wound management includes limitation of pain, prevention of infection, promotion of healing, preparation of wound for surgery.

Emergency treatment for first- and second-degree burns includes immersing the affected area in cool running



water for 10 minutes or more until the burning feelings subside. If the victim is burnt through clothing, the clothing should be left on and immersed in water.

Third-degree burns require extensive treatment. The burn area is cleansed and dead tissue scraped off (debrided). Severely burned skin becomes tight and rigid and is known as eschar. Eschar that encircles the neck and chest may restrict the ability to breathe and compress blood flow to vital organs. To release the tightness and allow breathing, an incision (escharotomy) may be needed along the neck. Repeated debridement may be necessary to fully determine the depth of the burn injury.

The preliminary treatment of the patient was already done and the wound was healthy and needs a cosmetic surgery and it's a challenge for us to deal with it.

Since the defect is large and extensive and local flap is not available. So other options that are available are free flap and distant pedicle flap for cheek defect and shoulder defect respectively.

For covering of cheek defect skin grafting is done for inner lining and free anterolateral thigh flap is used to reconstruct the defect.

For shoulder defect pedicle latissimusdorsi flap is used.

DISCUSSION

Face is the most important part of the body. Facial skin has got large papillary dermis with minimum amount of reticular dermis and is rich in vascularity. This area has tendency of rapid healing with quick deformation of face.⁴

The primary survey of airway (plus cervical spine), breathing, circulation, and decompression focuses on the immediate life- and limb-saving procedures that must be considered.⁵ The behavior of the wound also dictates the frequency of dressing changes.⁶ In thermal injuries, the treatment depends on the depth of the burn.⁷ Facial deformities that are associated after burn are neck contraction with limitation of movement, speech and eating difficulty, contraction of the chin with eversion of the lower lip.

Skin expansion widely used for the correction of skin deformity following burn injuries and other forms of traumatic skin loss^{8,9}. Skin expansion is an ideal way to grow skin that matches the color, texture, and hair bearance of the surrounding healthy skin, while minimizing scars and risk of rejection.¹⁰

A typical feature of these burns is the high rate of infection, which necessitates long periods of hospitalization.

Significant thermal injuries induce a state of immune suppression that predisposes burn patients to infectious complications^{11,12}. Therefore, patients with serious second or third degree burns require immediate

specialized care in order to minimize morbidity and mortality.¹³

Abnormalities of texture and pigmentation may cause concern, as well as focal hypertrophic or keloid scarring not associated with functional problems.¹⁴

Reconstruction is done when there is the need to release contractures and correct deformity. It depends on the availability of local and distant tissues. For the cheek, skin grafts, particularly full-thickness ones, can give a very pleasing appearance in terms of texture and movement. Pedicled flaps is used for replacement of the lower two-thirds of the face.^{15,16} Pedicled, expanded, and prefabricated flaps, which have received considerable attention in postburn facial reconstruction, have involved several novel techniques, including prefabricated, induced, and expanded flaps¹⁷. The range of flaps used is extensive, but attention has to focus on color match and texture, as in the retro-auriculo temporal flap,¹⁸ as well as adaptability. In the latter respect, the dorsal scapular artery flap can be used as a pedicled flap for facial reconstruction.

Pedicled flaps, particularly the latissimusdorsimyocutaneous flap, can create permanent and effective release^{19,20} Free flaps again can provide excellent functional and aesthetic results that are long lasting.²¹⁻²⁴ Such procedures need to be carefully planned and skillfully executed to achieve optimum results.

Neck and shoulder regions are monitored closely for potential stiffening of the joint region (joint contractures). If neck/shoulder mobility is restricted from the burn, the physiotherapist makes passive range of motion exercises, to prevent potential stiffening of the joint.



Pre Operative Picture



ALT FLAP PLANNING



PEDICLE LD FLAP PLANNING

7th post operative day

6month post operative photo

6MONTH POST OPERATIVE PHOTO



CONCLUSION

Reconstruction of post thermal burn of complex defect of face with exposed shoulder is really challenging due to depth of injury involving full thickness of skin and other structures. Antero Lateral Thigh (ALT) is very good flap for such complex defect with good outcome and aesthetic results. It requires proper planning with proper selection of flaps.

The choice depends on size of defect, availability of local tissues, patient acceptance and cooperation. The face

plays a major role in defining the identity of an individual, and the surgeon must do everything possible to protect that identity despite the presence of scarring.

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Source of Support: Nil, **Conflict of Interest:** None.

