

# Role of Tangential Excision and Skin Grafting in Chemical Burns

P Barath Kumar Singh<sup>1</sup>, Ravi Kumar Chittoria<sup>2</sup>

## How to cite this article:

P Barath Kumar Singh, Ravi Kumar Chittoria/Role of Tangential Excision and Skin Grafting in Chemical Burns/Indian J Biol 2022; 9(1):9-11.

**Author's Affiliation:** <sup>1</sup>Senior Resident, <sup>2</sup>Professor & Registrar (Academic), Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research Institute, Puducherry 605006, India.

**Corresponding Author:** Ravi Kumar Chittoria, Professor & Registrar (Academic), Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research Institute, Puducherry 605006, India.

**E-mail:** drchittoria@yahoo.com

**Received date:** 16.03.2022

**Accepted date:** 20.05.2022

## Abstract

Chemical Burns most commonly occurs in the industrial workers. Chemicals can injure the cells by exothermic reaction on the surface of the skin, which can also cause the thermal burns. Both acidic and alkali chemical burns are common in industrial workers. Chemical burns are treated by copious irrigation with water, hemodynamic stabilisation and other various methods. The aim of this article is to study the usefulness of the tangential excision and skin grafting in chemical burns.

**Keywords:** Tangential excision, Skin grafting, Chemical burns.

## Introduction

In the military, industrial, and household landscapes, there is a wide and ever expanding range of potentially dangerous compounds. Chemical burns account for only a small percentage of total skin burns, yet they can result in significant morbidity and mortality. Furthermore, chemical burns to the hand and upper extremities are the most common, and as a result, these injuries can result in severe temporary or permanent loss of function. Despite this, there is little discussion of how to treat these injuries in the hand surgery literature. Although the majority of chemical burns just require first aid and wound care, some require surgical debridement and, in rare cases, skin covering and rebuilding. The ingestion of certain

substances can cause serious systemic poisoning and even death. Understanding the distinction between thermal and chemical burns, as well as unique concerns for specific substances, will help patients receive better care.<sup>1</sup>

## Materials and Methods

This study was conducted in the department of Plastic Surgery at a tertiary care centre. The details of the patient are as follows:

A 45 year old gentleman, with no known comorbidities, a manual labourer at a pharmaceutical company, presented with alleged history of blast injury at a pharmaceutical factory and sustained chemical/thermal burns on 5th June, 2021 at



Fig. 1: Chemical Burns Involving Both hands Circumferentially

3:15 pm at Pondicherry, India. He had sustained second degree burns (superficial and deep partial thickness) over face, bilateral hands, left thigh and bilateral feet which comprised 20 % burns (figure 1). Initial management included copious irrigation of raw areas using normal saline, dressing of the raw areas. On 9<sup>th</sup> June, 2021 he underwent wound debridement under general anesthesia along with additional procedures such as sucralfate application and low level laser therapy. He also underwent autologous platelet rich plasma application which was obtained by standard double centrifugation protocol using 10ml of patient's blood which was used in 3 sittings. Tangential excision of the necrosed skin removed and prepared for wound grafting.<sup>2</sup> Tangential excision of a wound is defined as the sequential removal of eschar in thin layers until healthy tissue is reached. Punctate bleeding of the underlying wound bed signals the presence



Fig. 2: Post Tangential excision and skin grafting.

of viable tissue and the end point of excision. Tangential excision can be applied to any eschar of the skin in order to minimize the amount of tissue removed and preserve underlying viable tissue. It is most commonly used in burn surgery. Tangential excision done with the help of the skin grafting blade at the required thickness. Split thickness skin grafting was done after wound bed preparation (figure 2) for wound cover. Healed Chemical burns over the both hands (Figure 3) with movements of the fingers achieved by both active and passive physiotherapy

## Results

Chemical burns are treated initially by copious irrigation with water for the benefit of removing the chemical contamination and to prevent further chemical and exothermic reaction to prevent further damage to the skin.<sup>3,4</sup> It helps in preventing the excess damage to the skin. The damaged skin will be removed by wound debridement and tangential excision. The raw area created post wound debridement was grafted with the Split skin grafting helps in preventing the contractures of the burn area.



Fig. 3: Healed Burns of the hand

## Discussion

With the development of infection control, early excision and grafting of burns has become a critical component of any effective burn therapy. An open wound is mostly closed with this procedure, which eliminates the risk of infection.<sup>5</sup> There is less pain, a faster return to function, a speedier departure from the hospital, and a faster return to rehabilitation. Metabolic requirements are reduced, and the cosmetic outcome is enhanced with fewer scars. If possible, excision is performed between the third and fifth days after the burn, although more time may be required to evaluate which burns are superficial and can heal on their own. No more than 10% of the body's surface area is excised and grafted in a single operating session, and extensive burns necessitate sequential excisions.<sup>6</sup> To control shock and hypothermia, and to ensure a speedy recovery with early re-establishment of nutrition, the operation is limited to 1 and 1/2 hours. The most common anaesthetic used is ketamine, and viable fat is recommended as the grafting surface. Tangential excision is a type of early excision grafting that can be done alone or in combination with other methods to achieve a certain depth. It is useful in certain types of deep partial skin loss burns, particularly scalds, which are common in youngsters. A thin to moderate thickness allograft is put right away after several slices of necrotic skin are obtained till a punctate bleeding surface is attained in the deep dermis. The preservation of the deep dermis limits the area that can be transplanted, resulting in a graft with better texture and less scarring. Split thickness skin grafting restores epidermal function, avoids further hypothermia, protein and fluid losses, and infection risk, and integrates itself into the healing process, remains the primary permanent source of burn wound closure.<sup>7,8</sup>

## Conclusion

Our experience in management of chemical burns has showed to have positive results with Tangential excision of the burn wounds and skin grafting of the burn area. There was significant improvement

noted with the above methods in healing of raw areas. However, to strengthen the concept, multicentric experiments with a larger sample size are required.

**Conflicts of interest:** None.

## Declarations

**Authors' contributions:** All authors made contributions to the article

**Availability of data and materials:** Not applicable.

**Financial support and sponsorship:** None.

**Consent for publication:** Not applicable

## References

1. Williams FN, Lee JO (2018) Chemical burns. In: Herndon DN (Hrsg) Total burn care, 5. Aufl. Elsevier, S 408–413
2. Yin S. Chemical and Common Burns in Children. Clinical Pediatrics. 2017;56(5\_suppl):8S-12S.
3. Richards A, Dafydd H. Key Notes on Plastic Surgery. Chichester, UK: John Wiley & Sons, Ltd; 2014.
4. Sawhney, CP, Kaushish, R. Acid and alkali burns: considerations in management. Burns. 1989;15:132-134
5. Curreri PW, Asch MJ, Pruitt BA: The treatment of chemical burns: specialized diagnostic, therapeutic, and prognostic considerations. J Trauma 1970; 10: 634–642
6. Sheridan RL, Ryan CM, Quinby WC Jr et al: Emergency management of major hydrofluoric acid exposures. [review] Burns 1995; 21: 62–63
7. Pruitt BA Jr: Chemical injuries: epidemiology, classification and pathophysiology. Presented at the annual meeting of the American Burn Association, Las Vegas, Nev, Mar. 17, 1990.
8. Wolfort FG, DeMeester T, Knorr N et al: Surgical management of cutaneous lye burns. SurgGynecolObstet 1970; 131: 873–876

