

Role of Dermabrasion Assisted Tangential Excision in Burns

Krithika Lakshmi Arumugam¹, Ravi Kumar Chittoria², Amrutha J S³

How to cite this article:

Krithika Lakshmi Arumugam, Ravi Kumar Chittoria, Amrutha J S/Role of Dermabrasion Assisted Tangential Excision in Burns/Indian J Genet Mol Res. 2023; 12(2):51-53.

Abstract

Burn injury of second degree deep dermal and full thickness delays in healing and heals by scarring. Deep dermal burns need early treatment by tangential excision and skin grafting to promote healing. While wound irrigation, debridement, and local wound care may be sufficient for managing superficial burns (involving the epidermis and superficial dermal layer), deep burns (involving the deep dermal layer and other structures deeper to it) require tangential excision and skin grafting. If performed early it is associated with better outcomes in terms of reduced infection risk and hastened wound healing.

Keywords: Dermabrasion; Burns; Tangential excision.

INTRODUCTION

Dermabrasion, which was developed in the 1950s, mechanically abrades the epidermis and upper portion of the dermis. The epidermis is entirely abraded and there is partial removal of the dermis, which undergoes incomplete regeneration. It is a common procedure used by plastic surgeons.

It is used for a variety of indications like



Author Affiliation: ¹Junior Resident, Department of Plastic Surgery, ²Professor, Department of Plastic Surgery & Telemedicine, ³Senior Resident, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

Corresponding Author: Ravi Kumar Chittoria, Professor Department of Plastic Surgery & Telemedicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

E-mail: drchittoria@yahoo.com

Received on: 18.05.2023

Accepted on: 30.06.2023

acne scars, surgical scars, benign tumors, facial rejuvenation and many other uses. The process of burn wounds healing includes the removal of necrotic tissue, the hyperplasia of granulation tissue and epithelialization. The removal of necrotic tissue is the first step in dealing with burn wounds. Although there are a variety of adjuvant drugs for removing necrotic tissue, surgical debridement is still the main way of debridement of burn wounds. Surgical debridement of burn wounds includes escharotomy, tangential excision and dermabrasion. Escharotomy and tangential excision have been widely used in clinical practice, while dermabrasion has not been known to the majority of burns colleagues. This article summarizes the clinical application and progress of dermabrasion in burn wounds. Here we describe a use of dermabrasion assisted tangential excision of burn wounds. There were no many studies on dermabrasion assisted tangential excision.

MATERIALS AND METHODS

This study was conducted in the Department of Plastic Surgery in a tertiary care institute.

Informed consent was obtained. Department scientific committee approval was obtained. The patient under study was 8 year old male with no comorbidities presented with superficial and deep multiple 2nd degree burn wound involving both lower limb and right forearm of 25% TBSA due to accidental spillage of hot boiled water. Child admitted in burns ICU. Child burns managed with heparin saline irrigation, dermabrasion assisted tangential excision (Fig. 3), Low Level laser Therapy, Autologous Platelet Rich Plasma therapy,

Amniotic membrane application, regenerative scaffold, cyclical negative pressure wound therapy (Fig. 4). Dermabrasion was done using the high-speed rotating head dermabrader with 4200 rpm (Fig. 2). Dermabrasion was done under general anesthesia. Post procedure adrenaline saline used to stop the punctate bleeding and closed dressing system like Cyclical NPWT (negative pressure wound therapy) used for improving granulation and wound bed preparation. The child discharged after wound healing (Fig. 5).



Fig. 1: 2nd Degree superficial and deep burns involving both lowerlimb & right forearm ~25% TBSA



Fig. 2: Dermabrader



Fig. 4: Cyclical NPWT



Fig. 3: Dermabrasion assisted tangential excision



Fig. 5: Healed wound at discharge

RESULTS

It was found that dermabrasion assisted tangential excision of the scald burn wounds was shown to have favourable results in the form of early wound cover, reducing the risk of infection and improving wound healing thereby reducing hospital stays and treatment costs in addition to improving the prognosis. Patient compliance was good with this procedure.

DISCUSSION

Dermabrasion assisted tangential excision of burns has become an essential part of any successful management of burns. It helps with some types of deep burns with partial skin loss, especially scalds, which are one of the most common types of burn injuries. Tangential excision of a wound is defined as the sequential removal of necrosed skin in thin layers until healthy tissue is reached. Punctate bleeding of the underlying wound bed signifies that the underlying tissue is viable and that one has to stop excising further. Immediately after many slices of necrotic skin are removed, a thin to moderate thickness skin graft is placed. Tangential excision is most commonly used in burn surgery. With this technique, there is lowering risk of infection, less pain, a quicker return to normal activities, quicker discharge from the hospital, and a quicker return to recovery and early resumption of feeding. After obtaining many slices of necrotic skin until a punctate bleeding surface is seen on the underlying dermis. Deep dermal burns and full thickness burns are treated by early tangential excision followed by a split skin graft. After three weeks (sometimes a little more), deep dermal burns heal spontaneously as a result of a combination of formation of granulation tissue and epithelialization of the surrounding healthy skin.³ In full-thickness burns, all epithelial cells are destroyed and skin grafting is required. In literature, Dermabrasion done for deep dermal burns, not a full thickness wound, conjunction with more formal early tangential excision of deep dermal or full thickness burn. The patients had a more rapid healing, stable end result, a better beneficial appearance, prevents

hypertrophic scarring. The wound did not require grafting. In dermabrasion there is better control on depth, preserving the viable tissues, stable end point, rapid healing, less blood loss. Tangential excision is usually carried out between the third and fifth days following the burn. Only 10% of the body's surface area may be removed and replaced during a single losses.

CONCLUSION

In this study, treatment of the scald burns with dermabrasion assisted tangential excision of the burn wounds of the burn region have shown to have shown favourable outcomes in managing scald burns. With the available methods, there was a noticeable improvement in the healing of raw areas. However multi-centric tests with a bigger sample size are required to further establish the role of dermabrasion assisted tangential excision in scald burns.

REFERENCES

1. Campbell RM, Harmon CB Dermabrasion in our practice *Journal of Drugs in Dermatology: JDD* 2008, 7(2): 124-128.
2. Baker TM. Dermabrasion. As a complement to aesthetic surgery. *ClinPlast Surg.* Jan 1998; 25 (1):81-8.
3. Dziewulski P. Burn wound healing. *Burns* 1992; 18: 466-478.
4. Krant SM, Arons MS. Dermabrasion debridement of the deep dermal burn. *PlastReconstr Surg.* 1977 Jul;60(1):68-73.
5. Floccard B, Tixier F, Chatot-Henry D, Lacotte B, Mehdaoui H, Drault JN. Early dermabrasion of deep dermal burns with sandpaper. Case reports. *Scand J PlastReconstrSurg Hand Surg.* 1998 Dec;32(4):415-9.
6. Gallaher JR, Mjuweni S, Shah M, Cairns BA, Charles AG. Timing of early excision and grafting following burn in sub-Saharan Africa. *Burns.* 2015.
7. M Prasanna I, K Singh, P Kumar *Burns* 1994.
8. Williams FN, Lee JO (2018) Chemical burns. In: Herndon DN (Hrsg) *Total burn care*, 5. Aufl. Elsevier, S 408-413.
9. Yin S. Chemical and Common Burns in Children. *Clinical Pediatrics.* 2017;56(5_suppl):8S-12S.