

## Role of Dermabrasion Assisted Debridement in Burns

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### 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. Dermabrasion is an alternative method for tangential excision where the depth of excision up to viable tissue demarcated by punctate capillary bleeding. It is a useful alternative to early excision of the scar. In this case report we were assessing the role of dermabrasion assisted debridement in burn Injury.

**Keywords:** dermabrasion; burns; debridement.

## INTRODUCTION

Dermabrasion, which was developed in the 1950s, mechanically abrades the epidermis and upper portion of the dermis.<sup>1</sup> 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 acne scars, surgical scars, benign tumors, facial rejuvenation and many other uses.<sup>2</sup> 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 burn colleagues. This article summarizes the clinical application and progress of dermabrasion in burn wounds. Here we describe a use of dermabrasion assisted debridement of burn wounds. There were no many studies on dermabrasion assisted debridement.

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## MATERIALS AND METHODS

This study was conducted in the Department of Plastic Surgery in a tertiary care institute. Informed consent was obtained from the patient under study. Department scientific committee approval was obtained. It is a single center, non-randomized, non-controlled study. The patient under study was a 45 year old male, with no other known comorbidities presented with multiple second degree superficial and deep burns involving face, scalp, neck, chest and abdomen (anterior aspect), bilateral thigh due to contact with electric wire at time of presentation. In this case report we were using dermabrasion assisted debridement for the Scalp wound which was deep burns with mixed varying degrees with normal and in between non-viable necrotic tissue (Figure 1). The patient was intubated at the time of admission due to right frontal lobe contusion due to associated fall from height. The electrical burn will undergo progressive skin necrosis, so

the debridement was done after demarcation of necrotic patch and stabilisation of the hemodynamic of the patient. The dermabrasion is done using the high-speed rotating head dermabrader with 4200 rpm (Figure 2). The non-viable necrotic tissue was debrided (Figure 3) without damaging the normal tissues in both horizontal and vertical planes with motor-controlled hand probe. After wound debridement with derma-abrasion was done till the removal of unhealthy tissues (Figure 4). After debridement biological collagen scaffold dressing done (Figure 5). Small portable hand held dermabrader are available in market. End pieces are of various different size and shapes available say wire brushes, serrated wheels, diamond fraises, blunt tip. Dermabrasion can be done with local anesthesia. Post procedure patient may need adrenaline saline to stop the punctate bleeding and closed dressing system like NPWT (negative pressure wound therapy) for improving granulation and wound bed preparation post dermabrasion.



Fig. 1: Scalp electrical burns—at the time of presentation



Fig. 2: Dermabrader



Fig. 3: Dermabrasion of the necrotic skin over the scalp

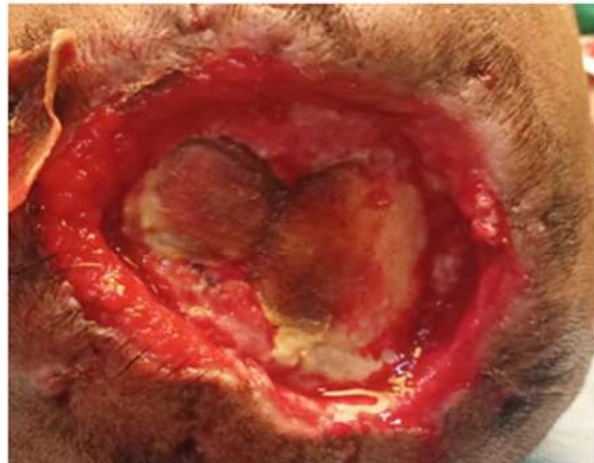


Fig. 4: Post Dermabrasion assisted debridement



Fig. 5: Post dermabrasion assisted debridement collagen scaffold dressing.

## RESULTS

Dermabrasion is an effective alternative to the debridement of the wound in burns. Patient compliance was good with this procedure. In this method of wound debridement with dermabrasion helps in layer-by-layer debridement without damaging the normal tissues. Postoperative period was uneventful.

## DISCUSSION

Dermabrasion is a simple, cost-effective means of skin resurfacing that can provide repeated and reliable results when used on the face or many other areas of the body. Numerous studies have demonstrated that dermabrasion is a reliable and effective method for skin resurfacing and should be a part of a plastic surgeon armamentarium in resurfacing damaged skin and the aging and damaged face. 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.<sup>3</sup> In full-thickness burns, all epithelial cells are destroyed and skin grafting is required. In this case report we preferred Dermabrasion as an alternative method for early excision of burn. 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 final appearance, prevents hypertrophic scarring.<sup>3</sup> The wound did not require grafting. Evidence that a skin graft on a burn wound that is in the process of healing will be rejected by underlying epithelialization but will have acted as a biological dressing.<sup>4</sup> Derma-abrasion compared with a classic method of excision. In addition, they all found a considerable reduction of blood loss, smaller planed surfaces compared with excised surfaces, reduced costs, and excellent graft setting in all cases.<sup>4</sup> In dermabrasion there is better control on depth, preserving the viable tissues, stable end point, rapid healing, less blood loss.<sup>5</sup>

## CONCLUSION

In our study we found that dermabrasion was useful and effective tool in debridement of the burn wound. Debridement is the effective process in preparing the wound bed, dermabrader assisted debridement reduces the bioburden with less damage to the healthy and normal tissues. The limitation of the study includes that it is a case report with a single center study with no statistical analysis. Further randomized controlled studies are required to validate the efficacy of the dermabrasion in deep dermal burn.

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