Ngr. Jr. Med. Sc. vol-2, issue-1 (Jan-2026) pp-25-28

ISSN: XXXX-XXXX(Online)

Nexus Global Research Journal of Medical Sciences

Journal Homepage: https://nexusglobalresearch.com/journal/ngrjms/

Case Report

Role of Dermabrasion Assisted Tangential Excision and Grafting in Perineal Burns

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ABSTRACT:

Burn wound management requires early and effective removal of devitalized tissue to promote healing, prevent infection, and improve functional and cosmetic outcomes. Dermabrasion, a mechanical method of controlled superficial tissue removal, is a well-established technique in plastic surgery but remains relatively underutilized in burn care. This article evaluates the role of dermabrasion-assisted tangential excision followed by grafting in the management of scald burns, particularly in challenging anatomical regions. We present a clinical case of a 2-year-old female with 15% total body surface area superficial and deep second-degree scald burns over the gluteal region. The patient underwent dermabrasion-assisted tangential excision using a high-speed dermabrader, followed by full-thickness skin allografting. The intervention resulted in early wound coverage, satisfactory graft takes, reduced risk of infection, accelerated healing, shorter hospital stays, and good patient compliance.

Keywords: *Dermabrasion-assisted excision; Scald burns; Pediatric burn management; Tangential excision; Skin allografting; Early wound healing*

INTRODUCTION

Dermabrasion, first developed in the 1950s, is a mechanical technique that abrades the epidermis and the superficial portion of the dermis. The procedure results in complete removal of the epidermis and partial removal of the dermis, which subsequently undergoes incomplete regeneration. Dermabrasion is a well-established procedure in plastic surgery and is commonly employed for a wide range of indications, including acne scars, surgical scars, benign cutaneous lesions, facial rejuvenation, and other reconstructive and aesthetic applications.[1]

Burn wound healing is a complex process involving removal of necrotic tissue, proliferation of granulation tissue, and epithelialization. Among these, early and effective debridement of necrotic tissue represents the critical initial step in burn wound management. Although various enzymatic and pharmacological agents are available as adjuncts for eschar removal, surgical debridement remains the primary and most effective method. Surgical debridement techniques in burn care include escharotomy, tangential excision, and dermabrasion.[2]

While escharotomy and tangential excision are widely adopted and well recognized in clinical practice, dermabrasion-assisted debridement remains relatively underutilized and less familiar to many burn surgeons. This article aims to summarize the clinical applications and recent advances in the use of dermabrasion for burn wound management. In particular, we describe the technique and outcomes of dermabrasion-assisted debridement in burn wounds. Currently, there is a limited number of studies evaluating the role of dermabrasion in burn wound debridement, highlighting the need for further clinical investigation.

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 2-year-old female with no comorbidities who presented with superficial and deep multiple

Corresponding author: Dr. Ravi Kumar Chittoria

DOI: 10.5281/zenodo.18340047

Received: 19 Jan 2026; **Accepted:** 22 Jan 2026; **Published:** 23 Jan 2026

2nd degree burn wound involving both lower limb, gluteal region and right arm of 15% TBSA due to accidental spillage of hot cooked gravy (Figure1). Child admitted and managed with wound irrigation, dermabrasion assisted tangential excision, wound care techniques and cyclical negative pressure wound therapy. Dermabrasion was done using the highspeed rotating head dermabrader with 4200 rpm in the deeper perineal regions (Figure 2). Dermabrasion was done under general anaesthesia following which full thickness skin allograft (from patient's mother) was placed over the dermabraded regions over the perineal region for quicker healing (Figure3). 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 dressing was opened and wound was examined on day3 and 7 with wound gealing present and early epithelisation.

Figure 1- Scald burns over the perineal region with deep burns marked

Figure2- Dermabrasion with rotating head dermabrader

Figure 3- Post dermabrasion raw area covered with allograft

RESULTS

It was found that dermabrasion assisted tangential excision followed by allografting 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 is a cornerstone of modern burn management, particularly in deep partial-thickness burns with partial skin loss. This technique is especially effective in scald injuries, which represent one of the most common causes of burn trauma.[1] Tangential excision involves the sequential removal of necrotic tissue in thin layers until viable dermal tissue is encountered. The presence of punctate bleeding from the wound bed serves as a reliable indicator of tissue viability and defines the endpoint of excision.[2] Following complete removal of devitalized tissue, immediate coverage with a skin graft is performed. Tangential excision is widely employed in burn surgery and is associated with several clinical advantages, including reduced infection rates, decreased postoperative pain, accelerated wound healing, shorter hospital stays, and earlier return to normal activity and enteral feeding.[2,3]

Deep dermal and full-thickness burns are optimally managed by early tangential excision followed by split-thickness or full-thickness skin grafting.[4,5] Deep dermal burns may undergo spontaneous healing within approximately three weeks through granulation tissue formation and epithelialization from adjacent healthy skin. In contrast, full-thickness burns result in complete destruction of epithelial elements, necessitating surgical excision and skin grafting to achieve definitive wound closure.[6,7]

Patients treated with early tangential excision demonstrate faster healing, improved wound stability, superior cosmetic outcomes, and a reduced incidence of hypertrophic scarring. Dermabrasion provides enhanced control over the depth of excision, facilitates preservation of viable tissue, establishes a consistent surgical endpoint, promotes rapid epithelialization, and minimizes intraoperative blood loss.[8]

Tangential excision is generally performed between the third and fifth post-burn day. To limit physiological stress and blood loss, excision and grafting.[9]

CONCLUSION

In this study, treatment of the scald burns with dermabrasion assisted tangential excision of the burn wounds followed by skin grafting 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 followed by skin grafting in scald burns.

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