

Role of Dermabrasion in Management of Pressure Necrosis in Child With Post Burn Contracture of Webspace

Anirudh Dwajan¹, Ravi Kumar Chittoria², Amrutha J.S.³

HOW TO CITE THIS ARTICLE:

Anirudh Dwajan, Ravi Kumar Chittoria, Amrutha J.S. Role of Dermabrasion in Management of Pressure Necrosis in Child with Post Burn Contracture of Webspace. *J of Pla Sur and Trans.* 2025; 6(1): 13-16.

ABSTRACT

Pressure injuries are areas of necrosis where soft tissues are compressed between bony prominences and external hard surfaces. They result from sustained mechanical pressure combined with friction, shear forces, and moisture. Pressure necrosis is an unwarranted, preventable complication and can be influenced by various internal and external factors.

Early removal of dead necrotic tissue from the pressure injuries can help improve the healing process by decreasing the time required for removing the necrotic material. We report an unusual case of fingertip pressure necrosis that developed during the treatment of a hand burn injury, in which dermabrasion was utilized as part of the management approach.

KEYWORDS

• Burns • Web Space • Contracture • Dermabrasion • Pressure Necrosis • Pediatric

INTRODUCTION

Pressure injuries occur where soft tissues are compressed between bony prominences and external hard surfaces. Prognosis is excellent for early-stage injuries; neglected and late-

stage injuries pose a risk of serious infection and are difficult to heal.

Dermabrasion is a modality primarily used to treat skin diseases. It is a resurfacing technique used to promote reepithelialization

AUTHOR'S AFFILIATION:

¹Junior Resident, Department of Orthopedics Surgery, JIPMER, Pondicherry 605006, India.

²Professor and Associate Dean (Academic), Head of IT Wing and Telemedicine, Department of Plastic Surgery and Telemedicine, JIPMER, Pondicherry 605006, India.

³Senior Resident, Department of Plastic Surgery, JIPMER, Pondicherry 605006, India.

CORRESPONDING AUTHOR:

Ravi Kumar Chittoria, Professor and Registrar (Academic), Head of IT Wing and Telemedicine, Department of Plastic Surgery and Telemedicine, JIPMER, Puducherry 605006, India.

E-mail: drchittoria@yahoo.com

➤ Received: 03-12-2024 ➤ Accepted: 03-02-2025



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution NonCommercial 4.0 License (<http://www.creativecommons.org/licenses/by-nc/4.0/>) which permits non-Commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the Red Flower Publication and Open Access pages (<https://www.rfppl.co.in>)

by removing the epidermis and promoting the growth of structural proteins, causing reepithelialization. It is used for a variety of indications, like post-acne scars, post-surgical scars, benign tumors, and facial rejuvenation. We present our experience of using dermabrasion to remove unhealthy skin formed due to pressure necrosis.

MATERIALS AND METHODS

This study was conducted in the Tertiary Care Centre in the Department of Plastic Surgery after getting the department's ethical

committee approval. Informed consent was obtained. The patient was a 9-year-old male child with post-scald burns scar contracture of the 3rd webspace, for which Joshi External Stabilizing System (JESS) distraction and contracture release was done. The patient came with the complaints of blackish discoloration of the left ring finger tip following application of a webspace splint on postoperative day 7. (Figure 1) It was limited to the inner aspect and side of the fingertip and was nonprogressive. It was associated with decreased sensation of the fingertip. Capillary refill time (CRT) was delayed.



Figure 1: Discolouration of left ring finger tip

The patient managed with oxygen inhalation, Heparin, Pentoxifylline, topical Minoxidil, and limb elevation. Digital Doppler showed reduced peak systolic velocity (PSV) in the medial digital vessel of the left ring finger. He underwent dermabrasion-assisted tangential excision using a high-speed

dermabrader at 4200 rpm (Figure 2). Following dermabrasion, punctate bleeding was observed on the fingertip (Figure 3), indicating preserved viability. A regenerative biological dressing using an amniotic membrane was subsequently applied.



Figure 2: Dermabrasion of ring finger necrotic region



Figure 3: Removal of necrotic superficial skin with active bleeding



Figure 4: Post operative wound

RESULTS

Intraoperative and post-operative periods were uneventful for the patient. Finger vascularity was found to be improved. Post procedure, CRT was found to be less than 3 secs, and sensations of fingertip had improved as compared to initial presentation. The wound was found to be well granulated. (Figure 4) No complications and side effects were noted during the entire procedure.

DISCUSSION

The National Pressure Injury Advisory Panel (NPIAP) defines a pressure ulcer as “localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device, as a result of intense and/or prolonged pressure or pressure in combination with shear.¹ Pressure necrosis is an unwarranted, preventable complication

and can be influenced by various internal and external factors.² They are primarily caused by sustained mechanical pressure combined with friction, shear forces, and moisture. Risk factors include age greater than 65 years, impaired circulation and tissue perfusion, immobilization, undernutrition, decreased sensation, and incontinence. The severity of these injuries ranges from non-blanchable erythema of intact skin to full-thickness skin loss with extensive soft tissue necrosis. Diagnosis is predominantly clinical. Management involves pressure of flooding, minimizing friction and shear forces, and providing meticulous wound care. In more complex cases, advanced therapies such as negative-pressure wound therapy, laser treatment, cellular and tissue-based products, and surgical interventions may be required. The prognosis is generally excellent for early-stage injuries; however, neglected or late-

stage injuries carry a significant risk of serious infection and are more challenging to heal.

Dermabrasion-assisted tangential excision has become a crucial component in the successful management of burn injuries. This technique is especially advantageous for managing certain deep burns with partial thickness skin loss, notably scald injuries, which are among the most common types of burn injuries.³ Tangential excision of a wound involves the sequential removal of necrotic skin in thin layers until healthy, viable tissue is exposed. The appearance of punctate bleeding from the wound bed serves as an indicator of tissue viability and signals the point at which further excision should be halted.⁴ Immediately after many slices of necrotic skin are removed, a thin to moderate thickness skin graft can be placed. With this technique, there is a lower risk of infection, less pain, a quicker return to normal activities, a better cosmetic appearance, and it prevents hypertrophic scarring.⁵ The wound did not require grafting. In dermabrasion, there is better control on depth, preserving the viable tissues. Removal of the skin layers in a controlled manner helps to achieve a desired level of fibroblast activity, resulting in the formation of new collagen type 1 collagen, which improves the skin appearance by causing modelling.⁷

CONCLUSION

We have demonstrated an effective and successful method to manage pressure necrosis in a patient with post burns hand injury.

REFERENCES

1. Edsberg L.E., Black J.M., Goldberg M., McNichol L., Moore L., Sieggreen M. Revised National Pressure Ulcer Advisory Panel pressure injury staging system: Revised pressure injury staging system. *J Wound Ostomy Continence Nurs.* 2016; 43: 585-597.
2. Allouni A., Zafar O, Wilson D. Pressure necrosis of the fingertip during management of hand burn injury: a word of caution. *International Wound Journal.* 2016 Apr; 13(2): 291.
3. Smith J.E. Dermabrasion. *Facial Plast Surg.* 2014 Feb;30(1):35-9.
4. Pang M., Zhao L., Liu S., Lei Y. Eschar Dermabrasion in Deep Dermal Partial-Thickness Burn: A Case Report. *Adv Skin Wound Care.* 2023 Jul 1; 36(7): 1-3.
5. Campbell RM, Harmon C.B. Dermabrasion in our practice *Journal of Drugs in Dermatology: JDD* 2008, 7(2): 124-128.
6. Krant S.M., Arons M.S. Dermabrasion debridement of the deep dermal burn. *Plast Reconstr Surg.* 1977 Jul; 60(1): 68-73.

