

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

Anirudh Dwajan, Ravi Kumar Chittoria\* and Amrutha JS

*Department Of Plastic Surgery, JIPMER, Pondicherry, India*

Correspondence should be addressed to Ravi Kumar Chittoria, MCh, DNB, MNAMS, FRCS (Edin), DSc, PhD (Plastic Surgery), Professor and Associate Dean (Academic), Head of IT Wing and Telemedicine, Department of Plastic Surgery and Telemedicine, JIPMER, Pondicherry - 605006, India

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### **ABSTRACT**

Pressure injuries are areas of necrosis where soft tissues are compressed between bony prominences and external hard surfaces. They are caused by unrelieved mechanical pressure in combination with friction, shearing 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 present an unusual case of fingertip pressure necrosis that occurred during the management of a hand burn injury for which use of Dermabrasion was incorporated into the management.

### **KEYWORDS**

Burns; Web space; Contracture; Dermabrasion; Pressure necrosis; Paediatrics

### **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 risk of serious infection and are difficult to heal.

Dermabrasion a modality primarily used to treat skin diseases. It is a resurfacing technique used to promote reepithelization by removing the epidermis and promoting growth of structural proteins causing reepithelization.

It is used for a variety of indications like acne scars, 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 Tertiary Care Centre in Department of Plastic Surgery after getting the department ethical committee approval. Informed consent was obtained. The subject was a 9-years-old male child with post scald burns scar contracture of 3<sup>rd</sup> webspace for which

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Joshi External Stabilizing System (JESS) distraction and contracture release was done. Patient came with the complaints of blackish dis-coloration of left ring finger tip following application of a webspace splint in postoperative day 7 (Figure 1). It was limited to inner aspect and side of the fingertip and was nonprogressive. It was associated with decreased sensation of fingertip. Capillary refill time(CRT) was delayed.



**Figure 1:** Discoloration 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 medial digital vessel of left ring finger. He underwent dermabrasion-assisted tangential excision using high speed dermabrader at 4200 RPM (Figure 2). Post dermabrasion, punctate bleeding was seen (Figure 3) on fingertip and viability of finger noted. Regenerative biological dressing with amniotic membrane was applied.



**Figure 2:** Dermabrasion of ring finger necrotic region.



**Figure 3:** Removal of necrotic superficial skin with active bleeding.

## **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 seconds 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 entire procedure.



**Figure 4:** Post operative wound

## **DISCUSSION**

The National Pressure Ulcer Advisory Panel (NPUAP) 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 caused by unrelieved mechanical pressure in combination with friction, shearing forces, and moisture. Risk factors include age >65, impaired circulation and tissue perfusion,

immobilization, undernutrition, decreased sensation, and incontinence. Severity ranges from non-blanchable skin erythema to full-thickness skin loss with extensive soft-tissue necrosis. Diagnosis is clinical. Treatment includes pressure reduction, avoidance of friction and shearing forces, and diligent wound care. Advanced treatments, including negative-pressure wound therapy, laser treatment, cellular and tissue-based products, and surgical intervention, are sometimes needed. Prognosis is excellent for early-stage injuries; neglected and late-stage injuries pose risk of serious infection and are difficult to heal.

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 [3]. 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 [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 lowering risk of infection, less pain, a quicker return to normal activities, a better cosmetic appearance and 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 for fibroblast activity, resulting in formation of new collagen type1 collagen which improves the skin appearance by causing modelling [6].

### **CONCLUSION**

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

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