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Role of Tangential Excision and Skin Grafting in Scald Burns

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Abstract

Scald burns are one of the most common types of burn injuries worldwide. Scalds are a form of thermal burns resulting from contact of the skin with moist heat or heated fluids such as boiling water or steam. Usually, in scald burns, the epidermis or a part of the dermis is mostly affected. Hence most scalds are considered first or second degree burns. The primary aim of the management of burns is to ensure adequate wound coverage. 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.

In this article, we see how tangential excision and skin grafting improved the clinical outcome in a 42 year old female who presented with scald burns involving both her lower limbs, comprising about 30% of the body surface.

Keywords: Tangential excision; Scalds; Skin grafting.

Introduction

Burn injuries are one of the common types of injuries encountered in the emergency department. Burns injuries are associated with a high degree of morbidity and mortality. In India, around 7 million people suffer from burn injuries each year with 1.4 lakh deaths and 2.4 lakh people suffering from disability with scald burns being one of the most common types of burn injuries. However, mortality from burns has significantly declined during the last few decades. The decline in mortality is attributed to several factors that improved over the years including the surgical technique of tangential excision. Early excision and grafting have been the standard care for decades. The current management of a patient with scald burns adequate resuscitation and correction of physiological derangements so that the cells in the zone of stasis either become necrotic or demonstrate viability. So usually there is a delay of 24 - 48 hours before proceeding with tangential

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excision and skin grafting for wound closure. Post-operatively the patient may go into a state of hyper metabolic response, which is commonly seen in patients with burn injuries. Hence, support for post-burn hyper metabolic response is very important for better clinical outcomes. One of the main challenges in treating acute thermal injuries is preventing infection. The burned and dead tissue of scald burns creates an opportunistic environment for microorganisms to grow, leading to wound infection which results in delayed wound healing, physiologic impairment, contractures, and functional deficits. Therefore, excising the devitalized tissue to render the wound bed relatively infection free and covering the wound with skin grafting as early as possible is critical. When burn patients undergo excision and skin grafting, there is a decrease in the length of hospital stay and hastened healing time.[1-3] This article is on the role of tangential excision and skin grafting in patients with scald burns.

Methods and materials

This study was conducted in the department of plastic surgery at JIPMER, a tertiary care medical centre. Informed consent was obtained for examination and clinical photographs. The patient on whom this study was conducted was a 45 year old female, who presented to the emergency department with an alleged history of accidental spillage of hot water resulting in scald burns on both lower limbs. She had sustained second degree burns (superficial and deep partial thickness) over both thighs, and legs which comprised 30% burns (Fig. 1).

Fig. 1: A 45 year old female presented with accidental 30% second degree scald burns over both lower limbs.

Initial management included copious irrigation of raw areas using normal saline and dressing of the raw areas. 3 days later, she underwent Tangential excision of the necrosed skin and prepared for skin grafting of the raw areas. Tangential excision was done with the help of Humby's skin grafting knife at the required thickness (Fig. 2).

Fig. 2: Tangential excision of the necrosed skin in the scald burns area is being performed 3 days after sustaining scald burns.

Split thickness skin grafting was done after wound bed preparation (Fig. 3) for wound cover.

Fig. 3: Split thickness skin graft being applied over the raw areas after tangential excision done 3 days after sustaining scald burns.

Healed burns with residues of the skin grafts and minimal raw areawere seen after postoperative day 7 (Fig. 4).

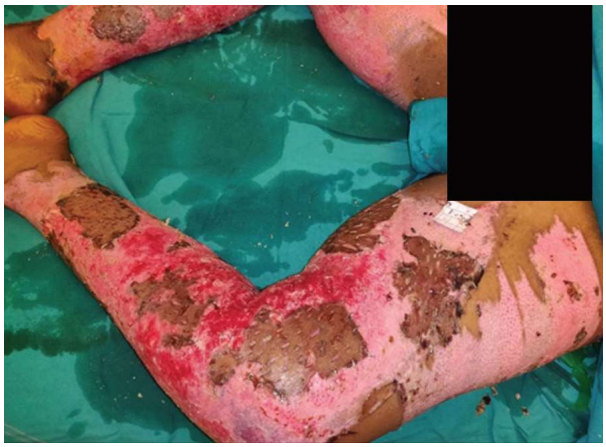

Fig. 4: Wound on postoperative day 7 skin graft ing with minimal residual raw area.

Results

It was found that tangential excision and skin grafting 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.[4]

Discussion

Tangential excision and skin grafting of burns have 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 rehabilitation. With fewer scars, metabolic requirements are reduced, and the cosmetic result is improved. 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 surgery, and severe burns require many excisions.[5] The procedure is limited to one and a half hours to prevent shock and hypothermia and ensure a quick recovery and early resumption of feeding. After obtaining many slices of necrotic skin until a punctate bleeding surface is seen on the underlying dermis, a skin graft of thin to moderate thickness is immediately applied. A graft with better texture and fewer scarring can be produced by limiting the region that can be transplanted by preserving the deep dermis. Split thickness skin grafting is still the major permanent method of burn wound closure because it restores epidermal function, and prevents further hypothermia, protein and fluid losses, and infection risk.[6]

Conclusion

In this study, treatment of the scald burns with tangential excision of the burn wounds and 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 tangential excision and skin grafting in scald burns.

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