CASE REPORT

Accumulative eschar after burn

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Key Clinical Message
Eschar formation is a potential sequela of burn injuries. Definitive management may include escharectomy and eschar debridement. After eschar removal, the wound can be covered with a skin graft or reepithelialization. For prolonged refractory eschar on the fingertips, topical use of rb-bFGF after debridement can achieve an optimal outcome.

Keywords
Accumulative eschar, fibroblast growth factor, granulation wound, hand burn.

Introduction
Eschar is composed of dead tissue and dried secretions from a skin wound following a burn or an infectious disease on the skin. The eschar provides temporary coverage of and protection to the wound. An eschar normally persists for less than a month before sloughing off or dissolving itself [1]. However, we encountered a patient with prolonged refractory accumulative eschar formation on her fingertips and finger pulps that remained for more than 2 years after a burn injury.

Case Report
A 28-year-old female presented with eschar crust on her fingertips and finger pulps. The patient had experienced a burn injury on the hand from an alcohol flame 2 years prior. The majority of the wounds healed well after topical ointment treatment. However, there were several areas of the fingertips and finger pulps where the new skin was thin, red, fragile, and sensitive. Six months after the injury, the thin skin in these areas was replaced by excretive granulation tissues. Initially, the secretions dried and a thin layer of crust formed. However, the crust thickened and led to formation of proliferating eschars.

The patient experienced mild discomfort but did not have pain in the affected areas. The accumulated thick eschar affected the function of the patient’s hands and interfered with everyday activities. To remove the eschars, the patient soaked her hand in water and removed the crust manually after the eschars had softened. The process was repeated every 1 to 2 months, after the eschars reformed. The patient then removed the eschars again using the same method.

Physical examination revealed that the patient’s fingertips and finger pulps were covered with grayish, hard crusts as thick as 1.5 to 2 cm (Fig. 1 left). Eschars were nonmovable. The patient felt pain in their fingertips when the eschars were touched. The hand was in a functional position and the range of movement of DIPs and PIPs was mildly limited. The range of movement of the metacarpophalangeal joints was normal. The patient was otherwise healthy.

To remove the eschars, both hands were soaked in warm saline solution for approximately one hour until all crusts

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were pale and soft. Forceps were used to remove all crusts without anesthesia. Saline solution was used to irrigate the wound bed until healthy granulation tissue was exposed (Fig. 1 right). Bleeding was minimal. Sterilized gauze was gently applied to stop any bleeding and to dry the wound. Three hundred units of Recombinant Bovine Basic Fibroblast Growth Factor Gel (rb-bFGF) per square centimeter were applied to the granulation tissue surfaces daily. The wound decreased in size noticeably each day and was completely healed after 2 weeks of treatment.

Outcome and Follow-Up

At the 5-month clinical follow-up the patient’s hands both functioned well. All affected DIPs could be fully extended, and the range of movement of these joints was normal. The patient had no difficulty performing everyday chores and had even returned to work as an accountant. Although the regenerated skin on the affected areas appeared slightly red, the quality, thickness, softness, and elasticity was comparable to surrounding healthy skin. Sensory function in the fingers was fully restored. The regenerated skin produced less sweat than normal skin. There was no recurrence of any eschar on affected areas after the rb-bFGF treatment (Fig. 2).

Discussion

The healing of burn wounds can be delayed if the wound is unattended or improperly managed. However, accumulative eschar formation caused by the proliferation of crust is not common; the residual wound tends to become an ulcer. In this case, the wound had briefly healed and was covered by a thin layer of epithelium. However, the coverage was not sufficient for the fingertips and finger pulps. The fragile epithelium broke and was replaced by exudative granulation tissue that began the process of eschar formation.

Recombinant bovine basic fibroblast growth factor has been reported to increase the growth of new capillary vessels and to induce the differentiation of fibroblasts [2]. These changes allow the dermis to regenerate and provide a solid base for scattered epithelial islands to form healthy epidermis. In our case, rb-bFGF healed the refractory burn wound quickly and allowed the formation of stable and durable regenerated skin. The new skin matched the particular needs of the fingertips.

Eschar proliferation as observed in this case is rare. The accumulative eschar contained dried secretions and blood. We believe that the location of the wound might be one of the main factors that contributed to eschar formation in this case. The wounds were on the fingertips and finger pulps, which might have been irritated whenever the patient used her hands. These irritations could induce discharge and minor bleeding from the wounds.

The accumulative eschars on fingertips compromised the patient’s quality of life. It remains unlikely that fingers with large eschars are able to function normally. The key to managing this condition is to cure the wound. Use of topical growth factor gel was the treatment of choice because it accelerated healing of the wound and regenerated high-quality dermis.

Conflict of Interest

None declared.
References

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