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Role of Feracrylum in Burn Wound Management

Deepak Ranjan Patro[1], Ravi Kumar Chittoria[2], Amrutha J S[3]

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Abstract

Thermal burns are skin injuries caused by excessive heat, typically from contact with hot surfaces, hot liquids, steam, or flame. Most burns are minor and can be treated as outpatients or at local hospitals. Approximately 6.5% of all burned patients receive treatment in specialized burn centers. Thermal burns are the most common type of burn injuries, making up about 86% of the burned patients requiring burn center admission. In this case we will assess the role of feracrylumin the management of burn wound. Feracrylum solution is a novel topical hemostatic agent, for use in control of oozing in various surgical procedures. It also possesses antimicrobial properties and decreases the wound infection.[1]

Keywords: Thermal burns, Feracrylum.

INTRODUCTION

About 86% of burns are thermal burns (43% from fire/flame, 34% from scalds, 9% from hot objects), 4% electrical burns, 3% chemical burns and 7% are other types of burns. Thermal burns cause both local injuries and if severe (> 20% of body surface area) a systemic response. The local injuries can be roughly separated into three zones of injury analogous to a circular target pattern. The innermost injury is the zone of coagulation or necrosis, representing the area of irreversible cell death. Surrounding this is the zone of ischemia or stasis, representing an area of decreased circulation and an area at increased risk of progression to necrosis due to hypoperfusion or infection. The outermost area is the zone of hyperemia, representing an area of reversible vasodilation and an area that usually returns to normal. In clinical practice, burns are dynamic injuries that may progress over hours to days, making it difficult to accurately determine the various zones during the early course of the injury. Large burns (>20% body surface area) also cause a systemic response from the release of inflammatory and vasoactive mediators. Fluid loss locally at the burn site, from oozing, blister occurs. Apart from fluid loss, continuous oozing can retard healing and can be a source of infection.The

Author's Affiliation: [1]Junior Resident, Department of Orthopedics Surgery, [2]Professor, Department of Plastic Surgery & Telemedicine, [3]Senior Resident, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

Corresponding Author: Ravi Kumar Chittoria, Professor, Department of Plastic Surgery & Telemedicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

E-mail: drchittoria@yahoo.com

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ultimate goals of burn restoration techniques are to conceal injuries, reestablish function, and maintain appearance. The three main surgical procedures for managing a wound are excision, grafting, and reconstruction.[3] Early excision and skin grafting minimize necrotic and diseased tissue while simultaneously enabling the first acute covering of burns. To prevent oozing from wound and promote wound healing, Feracrylum can be used. Feracrylum is a watersoluble mixture of incomplete ferrous salt of polyacrylic acid containing 0.05 to .5% of iron which acts as effective, safe and reliable topical haemostatic agent. It also possesses antimicrobial properties thereby decrease the risk of wound infection. Feracrylum is biocompatible, biodegradable and hygroscopic in nature.[2]

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 58 year old female who sustained accidental fire injury leading tosecond degree scald (superficial+deep) burns involving buttocks, anterior abdomen and chest, right upper limb, right lower limb 25% TBSA (Fig. 1). After initial resuscitation and stabilization, serial



Fig. 1: Use of Fevacrylum during first debridement

wound debridement, APRP, LLLT, Feracrylum application and regenerative scaffold dressing was done. Wound covered with SSG, dressing with Feracrylum (Fig. 2) and regenerative scaffold and NPWT continued. Graft uptake was good, no wound complications observed.



Fig. 2: Application of feracrylum solution

RESULTS

Intra-operative and post-operative periods were uneventful for the patient. Graft taken well. No signs of wound discharge/infection noted throughout the hospital course.

DISCUSSION

During phases of burn wound healing, there is inflammation which lead to vasodilation, increases capillary permeability, and persistent oozing from the wound. The secretions can cause significant fluid and protein loss, retard wound healing, and promote microbial growth. Feracrylum has three ways Action for wound care

1. ***Haemostatic Action 3:*** It causes activation of thrombin (Factor IIa) which is a serine protease that converts soluble fibrinogen into insoluble strands of fibrin thus forming clot as well ascatalyzing many other coagulation related reactions in blood coagulation. Also, feracrylum on coming in contact with blood proteins especially albumin, it forms a biodegradable water insoluble synthetic complex creating a large rubbery clot which forms a physical barrier on wound surface and stops capillary bleeding and oozing in 2-3 minutes. Itis non allergic with no systemic absorption.
2. ***Antimicrobial Action:*** Feracrylum is not only haemostatic but also anti-infective against anumber of Gram-positive and Gram-negative pathogenic, bacterial and fungal strains like Staphylococcus aureus, Streptococcus pyogenes, Corynebacterium

dipth eriae, Salmonellatyphi, Shigella dysentriae, Pseudomonas aeruginosa, Proteus vulgaris, Escherichia coli, Trichoderma viridae and Candida albicans. It ruptures microbial cell wall causing cell lysis. Feracrylum is superior to povidone iodinefor its antimicrobial properties and its efficacy is comparable to that of povidone iodine. Feracrylum decreases risk of wound infection which delays wound healing.[4,5]

CONCLUSION

Feracrylumplays a role in burn wound healing in burns. It helps in promoting the wound healing process. It helps in better healing of second degree superficial burns and wound bed preparation for deep burn wounds for further intervention.

Conflict of Interest: None declared.

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