Case Report

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Role of Dermal Extract and Collagen Scaffold in Management of Post Burns Raw Area

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Abstract

The quality of skin wound healing can be improved by the application of collagen scaffolds as biological dermal substitutes. Dermal extract helps to improves wound healing and quality of the scars. They serve as a scaffold into which cells can migrate and repair the injury. In the current scenario where in many biological and cellular engineering skin substitutes are available, wound management is a multimodality treatment with use of multiple available methods to augment wound healing at various levels. In this article we have described the role of dermal extract with collagen scaffolding in management of post burn raw area.

Keywords: Dermal Extract; Collagen Scaffold; Wound Healing; Post Burn Raw Area.

Introduction

Burns is a common problem which accounts for a share of morbidity and mortality for every country. The management of post burns wounds pose a challenge and early wound healing can reduce morbidity to the patients allowing a chance for early restoration into their normal life's. Continuous research has led advancements in burn wound care to allow for early wound healing and better functional recovery [1]. Dermal substitute is defined as bio-matrices which fulfil function of cutaneous dermal layer and provides matrices and scaffold for new tissue growth and thus increases rate of wound healing [2]. The collagen-GAG scaffold helps in supporting the in-growth of connective-tissue cell, thus causing regeneration of tissue providing the critical physiological functions of dermis [3]. In this article we have described a method to cover post burn raw area by using collagen scaffold and dermal extract in a patient with 40% accidental scald burns.

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Case Report

A 3 years old female child presented to tertiary care burns centre with history of accidental scald burns due to hot water 4 hours back. Patient had Ist and IInd degree superficial scald burns over right side face, right arm, right shoulder, right scapular, lower back and right gluteal regions with approximately 40% body surface area as per Lund and Browder Chart. On admission, patient was managed as per ATLS guidelines. Adequate analgesia and fluid resuscitation as per parklands formula were started. A collagen dressing was done on admission which was repeated on POD5. Check dress done on POD10 revealed most of the post burn wounds healed well except 5% post burn raw area over back , buttocks & right axilla with minimal slough.

Patient was operated for Hydrojet debridement of slough and a dermal extract with collagen scaffold dressing was done on POD14 under GA. A full thickness skin graft was harvested from right groin area and dermal extract was prepared. A scaffold was made out of collagen and dermal extract which was placed on the wound. Check dressing was done on POD 7. The post burn raw area had contracted to 20% of its size with multiple epithelial islands and minimal residual raw area in the region of collagen dermal extract and collagen scaffold. A collagen dressing was done and wounds healed completely

on POD 15. Patient was followed up for 1 month with post burn scar management in the form of compression garments, coconut oil massage, silicone gel and sunscreen application. All wounds healed well without hypertrophic scar formation or wound breakdown on follow up upto 1 month.

Fig. 1: Pre-operative photograph showing post burn raw area over back and gluteal region

Fig. 2: Intra- operative photograph showing dermal extract and collagen scaffold

Fig. 3: Postoperative photograph taken on POD 5 showing contracted healed wounds with minimal raw area with multiple small epithelial islands.

Discussion

Yannas and Burke in their landmark study on basic requirements of artificial dermal substitutes highlighted its use wound healing [4]. Various dermal substitutes available are like collagen scaffolds, synthetic materials, or cadaveric skin [4]. In burns patients, the available donor sites are limited. Split thickness graft usually is associated with donor site morbidity and may provide poor cosmetic outcome [5].

An ideal dermal substitute should be inexpensive, have a long life, can be used off the shelf, analgesic, durable, flexible, non antigenic, prevents water loss, conforms to irregular wounds, anti microbial, can be used in a single sitting [6].

Collagen is well known for its advantages such as easy to remove, inexpensive, pain free, hypoallergenic, various sizes, ability to store for 3 years and ability to incorporate drugs and growth factors which are released in controlled manner [7].

Dermal extract is known to augment wound healing with improved granulation and formation of epithelial islands promoting faster epithelisation [8]. The procedure can be performed under local anaesthesia with primary closure of donor site and hence minimal donor site morbidity. Since the tissue is autologous, it doesn't leads to antigenic reaction. Thus by combining collagen scaffold and dermal extract, the wound healing can be augmented in patients providing faster wound healing.

Conclusion

Through this article we would like to advocate the use of dermal extract with collagen scaffold as a means for raw area burn treatment. It is an effective method to augment healing with early epithelisation and minimal scarring without much donor site morbidity.

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