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Case Report

The role of collagen gel in the management of burns

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ABSTRACT

Many studies have been conducted on the use of biological dressings for burn wounds; collagen- and human amnion-based dressings are commonly used. Commercially available dry sheets based on collagen were used for the dressing. When changing their clothes, the patient may experience discomfort due to these dry sheets of collagen adhering to their skin. We are discussing our experience using topical collagen gel to treat a burn in this article. The preparation that was utilized was a gel-based preparation that contained 0.1% gentamicin sulphate and collagen of pure bovine origin, namely Type I collagen. Our research shows that this biological dressing has more benefits than downsides.

1. Introduction

According to estimates from the World Health Organization (WHO), thermal burn injuries account for more than 3 lakh deaths per year.[1] Burns affect millions of individuals physically and psychologically. Resuscitation and wound care are both essential components of effective burn management; wound care usually entails the application of dressings. These dressings aid in maintaining ideal wound healing conditions, preventing fluid and heat loss, and erecting a barrier against microbial invasion. Wound dressings have changed dramatically throughout time. Biological dressings, such as human amnion, were initially applied to promote wound healing. Later, collagen membranes gained popularity because they provided a range of storage choices in various sizes and forms and addressed worries about the hazards of viral infection associated with human amnion. The collagen dries and gets adherent to the raw area and separates only when the raw areas start to re epithelize. The removal of the collagen can be painful and tedious. Collagen membrane when applied over the flexor surfaces or irregular surfaces like nose or ears can prevent the movements of those areas. Collagen is available in various forms, like dry collagen sheets, wet collagen membrane, collagen granules, or collagen gel.

2. Materials and Methods

This study was conducted in the Department of Plastic Surgery at a tertiary care center after getting the departmental ethical committee approval. Informed written consent was taken from the parents of the patient. The study subject was a male 42-year-old male without co morbid conditions who developed a grade 2, 38% TBSA in his chest, neck and both upper limbs (Figure 1) as a result self-intentional burns with petrol. He was alone when this happened.

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Figure 1: At the time of presentation

The patient was admitted to the Burns ICU and was given painkillers, antibiotics, and IV fluids. Bandages are applied, and healing measures are taken (Figure 2). The patient was treated with topical application of medicated collagen gel (Figure 3).

Figure 2: Before application of the collagen gel

Figure 3: Application of the collagen gel

The source of the collagen was of bovine origin, composed mainly of Type I collagen combined with gentamicin sulfate 0.1% (w/w) in a gel base (Gen Coll). The burn wound was daily irrigated with sterile saline and repeated topical application of the Collagen gel was done. The healing process was recorded (Figure 4). Final wound after the complete healing process was noted (Figure 5).

Figure 4: Wound healing started

Figure 5: Final wound after healing

3. Result

At 15 days, epithelization had fully developed, and by the third week, pigmentation had begun to show (Figure 4). No issues came up during the investigation. Since the patient did not show up for follow-up, late complications like scarring were not evaluated.

4. Discussion

Both conservative and surgical methods can be used to treat a burn wound; severe burns typically need surgical methods such eschar removal and autologous split-thickness skin grafting to cover the wound. Morbidity, such as pain at the donor site and a corrugated scar at the recipient site, are the drawbacks of excision and grafting. Donor sites might not be suitable in cases of complete or almost whole full-thickness skin damage. Facial excision is not commonly performed. Dressings are often used in a conservative manner to treat superficial burns. Conventional dressings consist of biological dressings such as human amnion or cream containing silver sulfadiazine. Heterograft and allograft are other therapy possibilities. Allografts are short-term solutions for wound covering during the acute phases of an injury. Allografts can be either cadaveric or living donor skin grafted. Using allografts made of live or cadaveric human skin has drawbacks, such as a lack of donors, ethical concerns, the possibility of viral transmission, etc. Heterografting has been around for a while, and one popular heterograft is made of collagen sheets. Central Leather Research Institute Limited (CLRI) in Chennai conducts patented research to separate collagen from animal skin and reassemble it into a sheet. Collagen dressings serve as a vital substrate for cellular adhesion and migration in addition to giving the connective tissue mechanical support.[2,3] It is thought that collagen has a significant role in the process of regeneration.4,5Collagen promotes cellular development and has a low antigenicity. Collagen may influence healing both in the very early and late stages of the healing process. Wound healing and regeneration require cell proliferation, migration, differentiation, and interaction between the various components.[4–7] Collagen membranes come in a variety of sizes, are simple to remove, stable at room temperature, and can include growth factors or medications that can be administered under strict control. However, there are a few more drawbacks to employing collagen membrane: When the membrane is stretched on flexor surfaces or uneven surfaces, such as a face that cracks as it dries and shows scars through the membrane, it has led to apprehension amongst caregivers.. The collagen sheet over the face can sometimes make the movements of the face difficult especially once the membrane is dry. The topical application of the collagen gel is having an advantage over the collagen membrane as it can be easily applied over flexor surfaces and face without any complications. The disadvantage of topical collagen gel over the collagen membrane is that it does not have a mechanical barrier as effective as provided by a collagen membrane.

In literature the healing time with collagen gel ranges from 3 days to 21 days for superficial. In our study the healing time was 15 days which comparable with the literature.

5. Conclusion

When it comes to burn treatment, topical collagen gel use is quite beneficial. The collagen gel is painless, efficient, and simple enough for caregivers to apply themselves. The benefits of collagen membrane heterografting in wound healing and regeneration can be obtained through topical use of Collagen gel, which is also conveniently applied to flexor surfaces and the face. Yet, more information on the precise results will need to come from a multi-center, higher volume study.

6. Conflict of Interest

None.

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