



Traumatic Abrasions Treated with Lyophilized Collagen - A Case Series

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Abstract

Abrasions are superficial injuries of the skin resulting in a break in the continuity of tissue. They are simplest form of injuries which may heal without scar or with scar and traumatic tattooing. Here we present a case series of 15 patients with traumatic abrasions treated by using lyophilized collagen having autonomous self-healing ability.

Collagen sheets provide a well qualified wound cover providing an effective barrier to infection, retaining body heat, and promoting rapid healing through promoting epithelialization. In our series the use of collagen resulted in better quality wound healing and overall wound treatment. The cost factor is reduced and the pain associated with dressing can be avoided.

Introduction

Health care systems are being challenged to manage acute superficial abrasions as these may cause scar and traumatic tattooing [1,2]. Goal is to treat superficial abrasion without scarring or with minimal scarring and without tattooing. Here we present a case series of 15 patients with traumatic abrasions treated by using lyophilized collagen having autonomous self-healing ability [3]. Collagens have been extensively used in the medical field for several purposes due to its biocompatibility, safety and biodegradability. Application of collagen in acute abrasion is easy to apply, simple and results in better outcomes in terms of less scarring and better healing.

Methods

We have included 15 patients in the case series which came to our department with posttraumatic superficial abrasion and were treated using lyophilized collagen application. The injured are usually seen first in the emergency room and immediate removal of the embedded pigmented material is necessary to prevent tattooing. Each patient included in this series had abrasions at different sites including face, upper and lower limb. All patients underwent thorough examinations, routine investigations including culture sensitivity from wound and collagen application was done under general anesthesia in all patients. Wound was cleaned using betadine and chlorhexidine gluconate and cetrimide solution (savlon) with hydrogen peroxide followed by saline solution with brush to avoid tattooing in patients. After cleaning, lyophilized collagen sheet was used to cover the wound bed. There are multiple scar scale which are described, however we assess using Patient and Observer Scar Assessment Scale (POSAS). Patients were followed up at 21 days and at 3 months to see the results and grading of scar according to Patient and Observer Scar Assessment Scale (POSAS).

Discussion

Abrasions are superficial injuries of the skin resulting in a break in the continuity of tissue. They are simplest form of injuries which usually heal without leaving a scar. Majority of injuries are confined to the epidermis, those extending deeper to dermis heal by scar. Abrasions appear in all forms with friction being the most common mechanism [4]. Traumatic tattoo is defined as embedment of fine dirt particles under superficial layers of the dermis. These pigmented particles will leave a permanent dark blemish if not removed immediately. Best results are achieved by immediate meticulous care of wound [5].

In comparison to other existing treatment modalities, lyophilized form of collagen is preferred which is available commercially. When hydrated, it forms a pliable wound covering since bovine collagen is very similar to the human form [6]. Moreover, the collagen sheet is gradually absorbed by inflammatory cellular activity. The orderly in growth of epithelium over denuded areas needs

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Figure 1:



Figure 2:

a layer of collagen sheet to act as the scaffold on which to grow and arrange itself. Denuded areas are unable to provide this effectively, leading to formation of extensive scars and even keloids. It is for these purposes that denuded areas need a temporary cover until such time that the body is able to manufacture a cover of its own. Collagen sheet provides multiple benefits that cannot be provided by conventional dressing [7].

Collagen sheets provide a well qualified wound cover providing an effective barrier to infection, retaining body heat, and promoting rapid healing through promoting epithelialization [8].

Collagen sheets are produced from bovine tissues comprising mostly type I and III collagen, packed in dry form sterilized with gamma irradiation [9]. Basic principle of treating with collagen is a biological skin substitute, i.e. natural, easily available, ready to use, non-immunogenic, and non-pyrogenic. Biological dressings are the logical best candidate for the management of wounds since they create the most physiological interface between the wound surface and the environment. There is no threat of HIV or hepatitis infections as bovine material is obtained from countries free of BSE, and has a long shelf-life (5 years) under normal storage conditions [10].

The technique is inexpensive. The surgical technique can be performed in underdeveloped areas and yet have successful outcomes. The goal of treating acute abrasion by collagen dressing is to have better results in terms of less infection, better healing, less scarring.

Here we categorized the patient according to scar grading.

The POSAS includes subjective symptoms of pain and pruritus and expands on the objective data captured in the VSS.11It consists of two assessment scales: The Patient Scar Assessment Scale and the Observer Scar Assessment Scale. It assesses vascularity, pigmentation, thickness, relief, pliability, and surface area, and it incorporates patient assessments of pain, itching, color, stiffness, thickness,

and relief. The POSAS is the only scale that considers subjective symptoms of pain and pruritus, but like other scales it also lacks functional measurements as to whether the pain or pruritus interferes with quality of life. Linear regression analysis has demonstrated that the observer's opinion is influenced by vascularization, thickness, pigmentation, and relief, whereas the patient's opinion is primarily influenced by pruritus and scar thickness [6].

It contains six parameters, numerically from 1 to 10, which comprises the "total score" of the scale for both the patient and observer. In addition, the patient and observer also mark their "general opinion" regardless of the "total score," also scored from 1 to 10. The lowest score is 1 and corresponds to the normal skin situation. The total score of both scales can be calculated simply by adding the scores of each of the six parameters. The total score will range from 6 to 60 [11].

Results

Scar grading of cases according to Patient and Observer Scar Assessment Scale (POSAS). Among all cases the minimum patient assessment scoring of 17 at day 21 and 8 at 3 months whereas observer assessment scoring of 15 at 21 days and 6 at 3 months. The maximum patient assessment scoring of 45 at 21 days and 30 at 3 months whereas observer assessment scoring of 40 at 21 days and 25 at 3 months (Figures 1-5).

Conclusion

The average total score using the observer component of POSAS was 26.13 at day 21 and 15.8 at 3 months. Out of 15 cases average total score using patients' component of POSAS was 30.67 at day 21 and 21 at 3 months. Most of these patients were satisfied with the results after 3 months of follow up.

Collagen sheet has been found to be well tolerated in our series. In our series, the use of collagen resulted in better quality wound healing



Figure 3:



Figure 4:



Figure 5:

and overall wound treatment. The cost factor is reduced and the pain associated with dressing can be avoided. Application of collagen in acute abrasion is easy, simple and results in better outcomes in terms of less scarring and better healing.

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