



Role of Egg Membrane in Wound Healing: Our Experience Case Report

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Abstract

Ulcer is defined as a discontinuity in the skin lining. It may be an acute or a chronic ulcer. Chronic wounds are associated with a difficulty in the healing process and a prolonged morbidity for the patient. There are different methods of providing wound coverage including flap coverage, skin grafting, temporary substitutes for dressing etc. In this article we have used egg membrane for healing of wound and have found it to be useful.

Keywords: Wound healing; Skin lining; Ulcer

Introduction

Non healing ulcers is a challenge for the plastic surgeon. There is a delay in wound healing due to various factors like presence of foreign material, lack of growth factors, lack of nutrition, underlying infection etc. and coverage can be given to such chronic wound after adequate wound bed preparation (WBP) by using various methods. Biological membranes are used in wound healing including human amnion, porcine xeno graft, alloderm etc. Egg membrane has been used as household remedy for wound healing in various parts of the world.

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 patient. The details of the patient are as follows: 37 year old female without any co morbidities with h/o road traffic accident 4 months back, underwent right below knee amputation due to a vascular injury and a degloving injury of the left lower limb for which serial debridement was done in cardiothoracic and general surgery department. Now, the patient presented to plastic surgery department with extensive raw area over the left lower limb and

non-healing ulcer over the right below knee amputation stump (Figure 1).



Figure 1: Non healing ulcer.

The regular dressing and skin grafting did not lead to wound healing and had left raw areas which did not heal completely. We used egg membrane for dressing for the raw areas Egg membrane was harvested by making the outer shell of the egg sterile by immersing in 70% alcohol for 5 minutes. The egg was broken and

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contents discarded. The egg membrane between the egg shell and the contents was sterilized by immersing in penicillin or gentamicin. The egg membrane was applied over the wound. Repeat dressings are done on post-operative day 5 and on the subsequent alternated days till 4 dressings.

Results

There was good wound healing of the recipient areas of the wound along with good healing of the donor areas.

Discussion

An ideal wound dressing is one which can provide an environment suitable for rapid infection-free healing, cause minimal pain, and require minimal care (Figure 2).



Figure 2: Egg membrane treatment.

Although some commercial synthetic or composite materials meet these requirements, they are expensive and not very user-friendly. Among biological dressings, human amniotic membranes are useful in partial thickness skin wounds as a temporary dressing that can promote reepithelialization. However, Unger and Roberts found delayed healing time without significant reduction in when using lyophilized amniotic membranes to 8 skin graft donor sites [1]. Amniotic membranes are not used as dressings extensively because of their potential threat of human disease transmission [2, 3]. In clinical applications, amniotic membranes are fragile, difficult to use, become easily macerated, and are not readily available. Porcine skin is another material that has been used as a biological dressing however, as Salisbury et al [4,5]. When porcine xenografts were incorporated into the wounds of patients, it led to pronounced inflammatory responses and a prolonged healing time. Cadaver skin is difficult to obtain in Oriental countries due to lack of donors. Finally, collagen sheets become easily macerated; excessive wound discharge occurs; and the material is useful for superficial donor site wounds [6,7]. Egg membrane, the protective covering for chicken embryos, is a mixture of protein and glycoprotein. Egg membrane was first used in clinical trials in 1981, as described by Maeda and Sasaki [8]. Maeda and Sasaki presented 3 cases with epithelialization and

concluded that egg membrane is an inexpensive and a reliable biological dressing (Figure 3).



Figure 3: After egg membrane treatment.

Egg membrane is thin (60-70 μm), highly collagenized fibrous connective tissue comprised of both an inner and an outer layer. Egg membrane is comprised mainly of protein, making up 88%-96% of dry weight and its unique structure provides adhesion and vapor transmission. Egg membrane is a cell membrane sheet that without a nuclear DNA [9]. Theoretically, egg membrane has very less antigenicity.

Conclusion

Egg membrane can be used as treatment of non-healing ulcers with minimal donor site morbidity.

Declarations

Authors' contributions

All authors made contributions to the article, Availability of data and materials, not applicable.

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Conflicts of Interest

None

Consent for Publication

Not applicable

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