

Role of Modified Egg Membrane in Wound Healing

Gagan Neravati, Ravi Kumar Chittoria* and Bharat Prakash Reddy J

¹Intern Department of Plastic Surgery, JIPMER, India

²Professor and Registrar (Academic), Head of IT, Wing and Telemedicine, Department of Plastic Surgery and Telemedicine, JIPMER, India

³MBBS MS General Surgery, Senior Resident, Department of Plastic Surgery, JIPMER, India

*Corresponding author: Ravi Kumar Chittoria, Professor and Registrar (Academic), Head of IT, Wing and Telemedicine, Department of Plastic Surgery and Telemedicine, JIPMER, Pondicherry, 605006, India

ARTICLE INFO

Received: 📅 July 19, 2024

Published: 📅 July 25, 2024

Citation: Gagan Neravati, Ravi Kumar Chittoria and Bharat Prakash Reddy J. Role of Modified Egg Membrane in Wound Healing. Biomed J Sci & Tech Res 57(5)-2024. BJSTR. MS.ID.009064.

ABSTRACT

Ulcer is a discontinuity in the lining of the skin. It may be acute or long standing. Non-healing ulcers are associated with delay in the healing process and a prolonged morbidity for the patient. There are providing wound coverage including flap coverage, skin grafting, temporary substitutes for dressing etc. In this article we have used modified egg membrane by boiling the egg application for healing of wound and have found it to be useful.

Keywords: Modified Egg Membrane; Burns

Introduction

Burn wounds are a challenge for the plastic surgeon. There is a delay in wound healing due to various factors like foreign material, decreased growth factors, decreased nutrition, underlying infection etc. and coverage can be given to wound after adequate wound bed preparation (WBP). Biological membranes are used in wound healing which include human amnion, porcine, xenograft, alloderm etc.

Materials and Methods

This study was conducted in the department of Plastic Surgery at tertiary care center with the departmental ethical committee approval. Informed written consent was obtained from the patient. The details of the patient are as follows: 42 year old male without comorbidities was brought with a history of burn injury due to petroleum fire to JIPMER EMS ICU where he was adequately resuscitated. He

was transferred to BURNS ICU i/v/o burns with 38%TBSA involving Neck, chest, abdomen, back and medial aspect of both upper limbs. Superficial burns extending to deep dermal burns are seen in front of chest. We decided to use egg membrane for wound healing over the chest. We used boiled egg for getting egg membrane for dressing for the raw areas. Egg membrane was harvested by boiling the egg at 100-degree Celsius and making the outer shell of the egg sterile by immersing in 70% alcohol for 5 minutes. The egg was broken and the egg membrane between the egg shell and the contents was made sterile by immersing in penicillin or gentamicin. The egg membrane was applied over the burn wounds (Figure 1). Repeat dressings were done on alternate days.

Result

There was good wound healing of the recipient areas of the wound (Figures 2 & 3).



Figure 1: Application of egg membrane over chest.



Figure 2: Enhanced wound healing seen over chest wall.



Figure 3: Extraction of egg membrane.

Discussion

An ideal wound dressing can provide an environment suitable for rapid infection-free healing, cause minimal pain, require minimal care. Although some commercial synthetic or composite materials meet these requirements, they are costly 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 reepithelialisation. In clinical applications, amniotic membranes are fragile, difficult to use, become easily macerated, and are not readily available, [1] Porcine skin is another material that has been used as a biological dressing. However, as Salisbury et al. [2] porcine xenografts incorporated into the wounds of patients, caused pronounced inflammatory responses and a prolonged healing time. Finally, collagen sheets become easily macerated; excessive wound discharge occurs; and the material is useful for superficial donor site wounds [3,4]. 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 [5]. Maeda and Sasaki presented 3 cases with epithelialization and concluded that egg membrane is an inexpensive and a reliable biological dressing. 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. Theoretically, egg membrane has very less antigenicity. The advantage of using boiled egg membrane is that we can harvest larger area of membrane [6].

Conclusion

Egg membrane can be used as treatment for burn injuries.

References

1. Ramakrishnan KM, Jayaramam V (1997) Management of partial thickness burn wounds by amniotic membrane: a cost-effective treatment in developing countries. *Burns* 23(suppl 1): S33-S36.
2. Salisbury RE, Wilmore DW, Silverstein P, Pruitt BA (1973) Biologic dressings for skin graft donor sites. *Arch Surg* 106: 705-706.
3. Yang JY (1990) Clinical application of collagen sheet, YCWM, as burn wound dressing. *Burns* 16: 457- 461.
4. Sawada Y, Yotsuyanagi T, Sone K (1990) A silicone gel sheet dressing containing an antimicrobial agent for split thickness donor site wounds. *Brit J Plast Surg* 43: 88-93.
5. Maeda K, Sasaki Y (1981) An experience of hen-egg membrane as a biological dressing. *Burns* 8(5): 313-316.
6. Leach RM (1982) Biochemistry of the organic matrix of the eggshell. *Poult Sci* 61(10): 2040-2047.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2024.57.009064

Ravi Kumar Chittoria. Biomed J Sci & Tech Res



This work is licensed under Creative Commons Attribution 4.0 License

Submission Link: <https://biomedres.us/submit-manuscript.php>



Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

<https://biomedres.us/>