

REVIEW ARTICLE

ROLE OF COLLAGEN MEMBRANE - A COMPREHENSIVE REVIEW

Abdul Rahman¹, I.Packiaraj¹, Genmorgan¹, Alaguvelrajan¹, Kandasamy²

¹Department of Oral &Maxillofacial Surgery, ²Department of Oral Medicine and Radiology.
Rajas Dental College and Hospital. Kavalkinaru

ABSTRACT:

Oral and maxillofacial surgeons treat various pathologies in and around the oral cavity. The commonest protocol for all pathologies is the surgical excision. If the post operative wounds that are left uncovered are prone to infection and scarring. There are many biological material available to dress the open wounds, which reduces the incidence of infection and degree of contraction. The biological materials act as a graft which may either autogenous like skin graft or alloplastic like the collagen membrane. There donor site morbidity where the place of donor site region. This article states to assess the efficacy of collagen membrane is an alternative to autogenous graft in the oral cavity.

Key words: Autogenous graft, Collagen membrane, Wounds.

Corresponding author: Dr. Abdul Rahman, Department of Oral &Maxillofacial Surgery, Rajas Dental College and Hospital. Kavalkinaru, India. E mail: rahman.bds@gmail.com

This article may be cited as: Rahman A, Packiaraj I, Genmorgan, Alaguvelrajan, Kandasamy. Role Of Collagen Membrane - A Comprehensive Review. J Adv Med Dent Scie Res 2015;3(3):95-97.

INTRODUCTION

The different type of injuries causes various types of wounds. To initiate wound healing we use various different dressing materials to ensure good healing process. Studies has proven the concept of an optimum environment for wound repair and the active involvement of the wound dressing in establishing and maintaining such as optimal environment.¹⁻⁴

Over the ages, a variety of dressing materials have been evaluated for suitability as temporary or permanent cover after burns and to treat denuded areas and surgical defects. From the use of fresh meat and honey to the use of antibiotic films, synthetic, plastic, porcine, xenograft and artificial skin, may other materials have been evaluated and studied in an attempt to develop ideal wound cover.²

One of the biological products is bovine-derived xenogenous collagen, a biological platis which can be molded line wax into desired forms because of its easy availability, method of extraction, purification and low antigenicity, it has been used under many clinical considerations as a temporary dressing material with favourable results.⁴

Wounds left uncovered are prone to infection, contraction, scarring with other clinical

complications. Raw wounds in the oral cavity behave similarly; a need therefore arises to use a biologic cover to prevent these complications. Free split thickness skin graft and free mucosal graft have been used to cover the raw wounds in the oral cavity. The use of these grafts required a separate surgical procedure with technical difficulties. The color and texture of skin do not confirm totally to oral cavity.⁵ Donor sites for mucosal graft are limited and there is always morbidity associated with donor site healing. The oral environment and its constant movements are impediments to graft acceptance.

USES

The tolerance of xenogenous collagen by tissue and its successful use as a temporary cover for burns have prompted this article mentioned about xenogenous cross linked collagen sheet as a cover surgical wound in the oral cavity³, Surgical technique include patient age, sex, site of the lesion and type of anesthesia. After excision of the lesion wound is covered by collagen dressing. The collagen is a purified bovine serosa reconstituted collagen. Purified collagen refers to collagen that is free from other components normally associated with it in its native state. This reconstituted collagen is cross linked with tanning agents such as gluteraldehyde or chromium sulphate so that its

tensile strength is improved, it becomes insoluble, its rate of resorption is slow down and its antigenicity is markedly lower.³

TYPES

Collagen membrane comes in varying in dimensions of 10x10 cm, 10x25cm and 25x25. thickness is 0.6mm. It is sterilized by ethylene oxide and its marked in vital format containing isopropyl alcohol and water as preservative media.¹

SURGICAL METHOD

This article was confined that use of collagen is secondary defects of the oral mucosa which occur after excision of premalignant lesions, benign lesions, reactive proliferations and incisional biopsy wounds.² The collagen membrane was stabilized by use of No3 silk sutures at periphery of the defect and few sutures in the centre of membrane over the defect no pressure dressing was used.¹

Formability of collagen sheet was assessed suppleness, resiliency and dressing ability to mimic wound and surrounding normal tissue.

Hemostasis by the membrane was assessed 1 hour and 1 day post operatively. In the post operative period, the following parameters was considered. They are pain being subjective. Adherence was based on the ability of the collagen to adhere to the wound, the presence of granulation tissue was noted at the end of 2 weeks, epithelialisation was noted at the end of the month, contracture of wound site at the end of 3 months.⁴ Reactivity of the material was assessed depending on the reactions elicited.

DISCUSSION

Biomaterials derived from animal origin especially those based on collagen have been used in various fields of surgery¹. It has been possible to use collagen in various forms in recent times. Collagen in the form of leminates, sheets, fabrics, gels, powders and sponges are available and has been used as dressing for ulcers and burns as a hemostatic agent and in tendon grafting in the induction of bone formation.

Normally, bovine xenogenous collagen sheet cross linked with glutaraldehyde has been used as a temporary cover in excised lesions which could not be closed primarily.³

Wounds that are left uncovered are prone to infection and scaring. There is reduced incidence of infection and degree of contraction with

biological materials rather than left exposed or dressed with non biological materials during healing. The fact that grafted wounds heal faster with fewer complications than open wounds.⁴

Skin offers best solutions because they come nearest to fulfilling the requirements of an ideal graft material, which include the ability to replace the lost structures and ability to induce the formation of such tissues. Skin consists almost entirely of collagen and an autogenous skin graft has been shown to be successful as a tissue transplant to cover areas in the mouth denuded of mucous membrane. The grafts became vascularised within the first week and there was a gradual epithelisation of the grafted area resulting in a covering of normal mucous membrane. There is still donor site morbidity, and the technique is complicated costly and unsuitable for elderly persons with loss of dermal tissue. Skin graft used in oral cavity always retained the colour of mucosa and never attain the texture or the resiliency of the oral mucosa.²

A bovine xenogenous collagen membrane is easily obtainable and its usage is an alternative to cover secondary wounds of the oral cavity. With the collagen membrane one does not need to perform a second operation for obtaining graft nor would one encounter morbidity and problems associated with donor site healing³. It was observed that the xenogenous collageneous membrane had good conformability in the mucous lining. That is it yielded a good clinical assessment with regard to its suppleness, resiliency and dressing ability to mimic oral wound and surrounding normal tissue⁵. The adherence of collagen membrane appeared to fulfil in controlling scars by controlling infection and minimizing growth of granulation tissue though xenogenic, it showed good biocompatibility as proven by cytologic smear reports.⁵

CONCLUSION

Collagen membrane obtained xenogenously does not fulfil all requirements of an ideal graft but is an alternative. Its application in the oral cavity is easy because of the simple chair side procedure and good tolerance of membrane by oral tissues, it can therefore be advocated as a temporary biological dressing material in the oral cavity devoid of mucous membrane. It is an alternative to autogenous graft rather than a replacement of other grafts used in the oral cavity and a satisfactory addition to the instrument of oral surgeons.

REFERENCES

1. Abbenhaus JL, Mac mahon RA, Rosenkrantz JG. Collagen sheets as a dressing for large excised areas. Surgical Forum 16:477,1965.
2. Bartlett RH. Skin substitutes Journal trauma 21:731,1981.
3. Mitchell R. The use of collagen in oral surgery. Ann Acad Med 15:355,1986.
4. Mitchell R. A new biological dressing for areas denuded of mucous membrane. British dental Journal 155:346,1983.
5. Nanchahal J, Werd CM, New grafts for old?. A review of alternative to autologous skin. British journal of plastic surgery. 45:354,1992.

Source of support: Nil

Conflict of interest: None declared

