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A Comparative Study of Collagen Granule Dressings versus Conventional Dressings in Chronic Wounds

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ABSTRACT

Wounds can cause painful lengthy hospital stay, multiple stages of surgeries, and enormous financial burden. During the last decade, various new dressing materials developed, like calcium alginate, hydro- colloid membranes and fine mesh gauze. These have disadvantage in that they become permeable to bacteria. Biological dressings like collagen on other hand, create the most physiological interface between the wound surface and environment, and impermeable to bacteria. Biological dressing's collagen granule dressing has advantage over conventional dressing in terms of, non-immunogenic, non-pyrogenic, being natural, easy application and decreased days of healing.

Keywords: Collagen dressing, chronic Wounds, Wound Healing, Wound History, wound dressing

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INTRODUCTION

Wound Healing is a dynamic process involving soluble mediators, a variety of cells, and extracellular matrix[1]. Wound results from precise disruption of tissue by the surgeon's knife (incision) to widespread damage of tissue (e.g. major trauma, burns). It also results from a contusion, hematoma, laceration or an abrasion. The continuity of the skin must be restored expeditiously because it plays a crucial role in maintaining homeostasis[2]. An ideal dressing used in the wound management should be economical, easy to apply, readily available dressing or method or coverage that will provide good pain relief, protect wound from infection, promote healing, keep moisture, be elastic, and non - antigenic and adhere well to the wound and waiting for spontaneous epithelisation and healthy granulation tissue[3] .

Among newer type of wound dressings - Biological Dressings like Collagen create the most physiological interface between the wound surface, environment and impermeable to bacteria. Collagen, the most abundant protein in the body, plays a critical role in the successful completion of adult wound healing. Its deposition, maturation, and subsequent remodeling are essential to the functional integrity of the wound[4].

Collagen granule dressing has better advantage over conventional dressing in terms of Collagen formation with greater reduction in inflammatory cells during healing days resulting in decreased days of healing, where as conventional dressing has minimal collagen formation, high grade of inflammation during the healing days with maximum exudates. A collagen granule dressing has another advantage over conventional dressing in terms of: - non- immunogenic, non- pyrogenic, being natural, easy application, hypo allergic and pain free[5].

Aims and objective

- To study effect of collagen dressings on chronic ulcers.
- To compare the effect of collagen dressing and conventional dressings.
- To compare the advantage of collagen dressing over conventional dressings.
- To evaluate the cost effectiveness of treatment of ulcers.

MATERIAL AND METHOD

The study was conducted in the Department of General Surgery, Govt. Medical College Kota (Rajasthan). A total of 100 patients suffering from chronic ulcers were taken randomly for study after explaining the procedure and motto of study informed consent of patient or attendant was the taken prior to enrolment in the study. Detailed history and clinical examination of ulcer done.

Material used:

1) collagen dressings (particles)
2) conventional dressing as dressing with antiseptic material(povidone iodine)

The material used for collagen dressings is medifill. Medifill is in the form of particles. It is a spherical hydrophilic particle 0.1 to 0.3 mm in diameter. Each gram of collagen absorbs about 40 to 60 times its weight in fluid absorption causes suction and capillary action in spaces between particles. It is available in 2.5, 5, 10 and 15 ml packets.

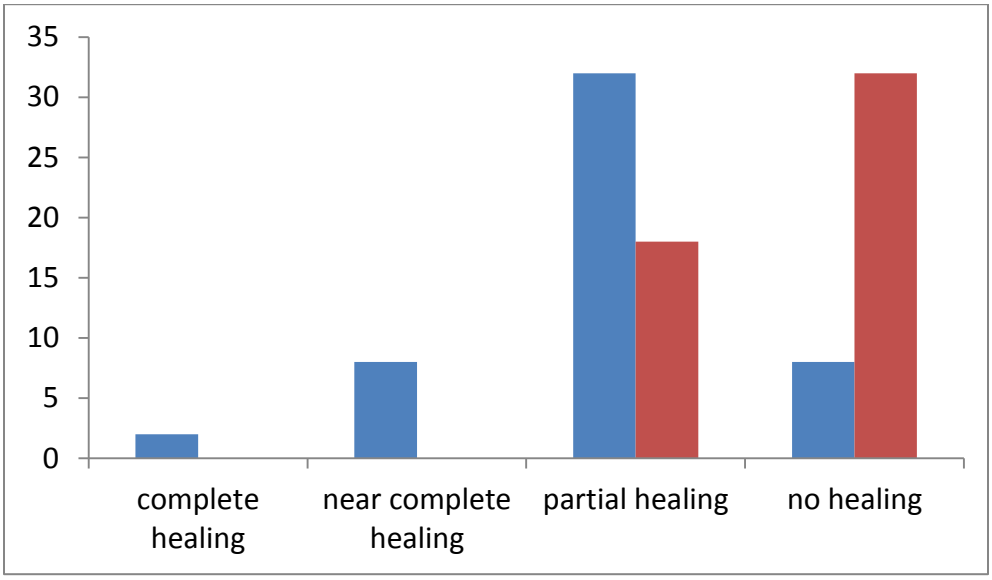
Method of application:-

1) Debride and clean the wound leave the wound moist to facilitate the action of medifill.
2) Apply medifill particle in ¼ inch deep layer over the wound.
3) Change the dressing every 2 to 5 day's on the basis of drainage from wound:
   a) Moderate to heavy draining wound 2 to 3 days
   b) When drainage become low 3 to 5 days.
4) Remove by washing with normal saline solution when particles becomes saturated,
5) Cover with saline socked gauze piece:

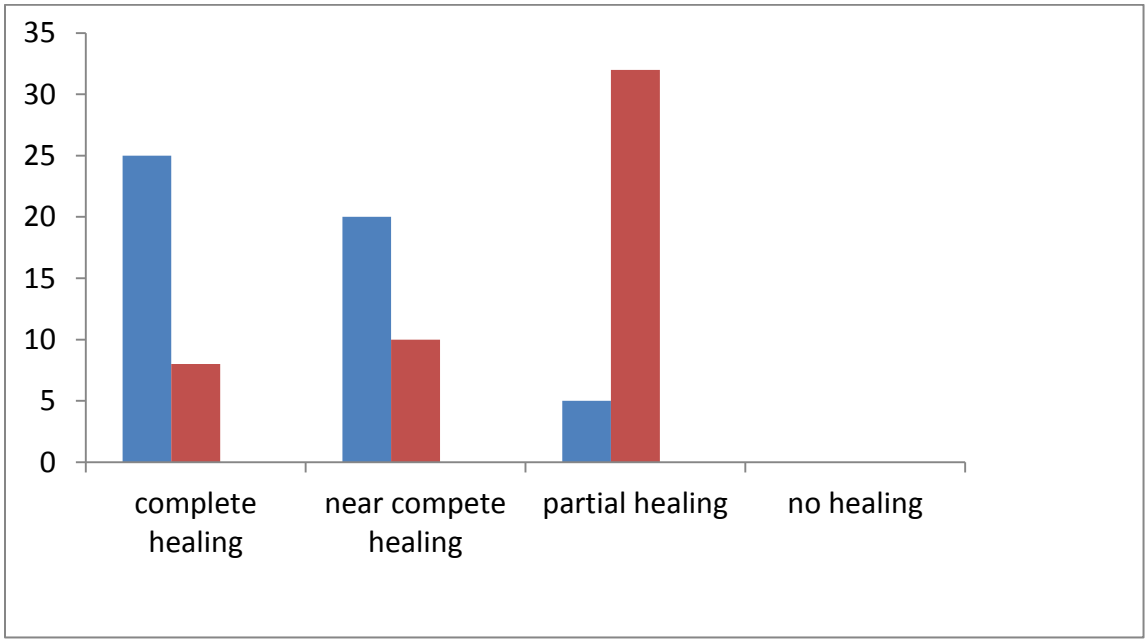
In our study of total 100 patients,90%(90) are male and remaining 10%(10) patient are female. In collagen particle group 90%(45)were male and 10%(5) female. In conventional dressing group 90 %(45) were male and 10%(5) female.

There were 30%(30) patient of abdominal wall ulcer, 24%(24) foot ulcers, all other ulcer site includes 46%(46) patients. In our study we included different type of ulcers, out of these:-

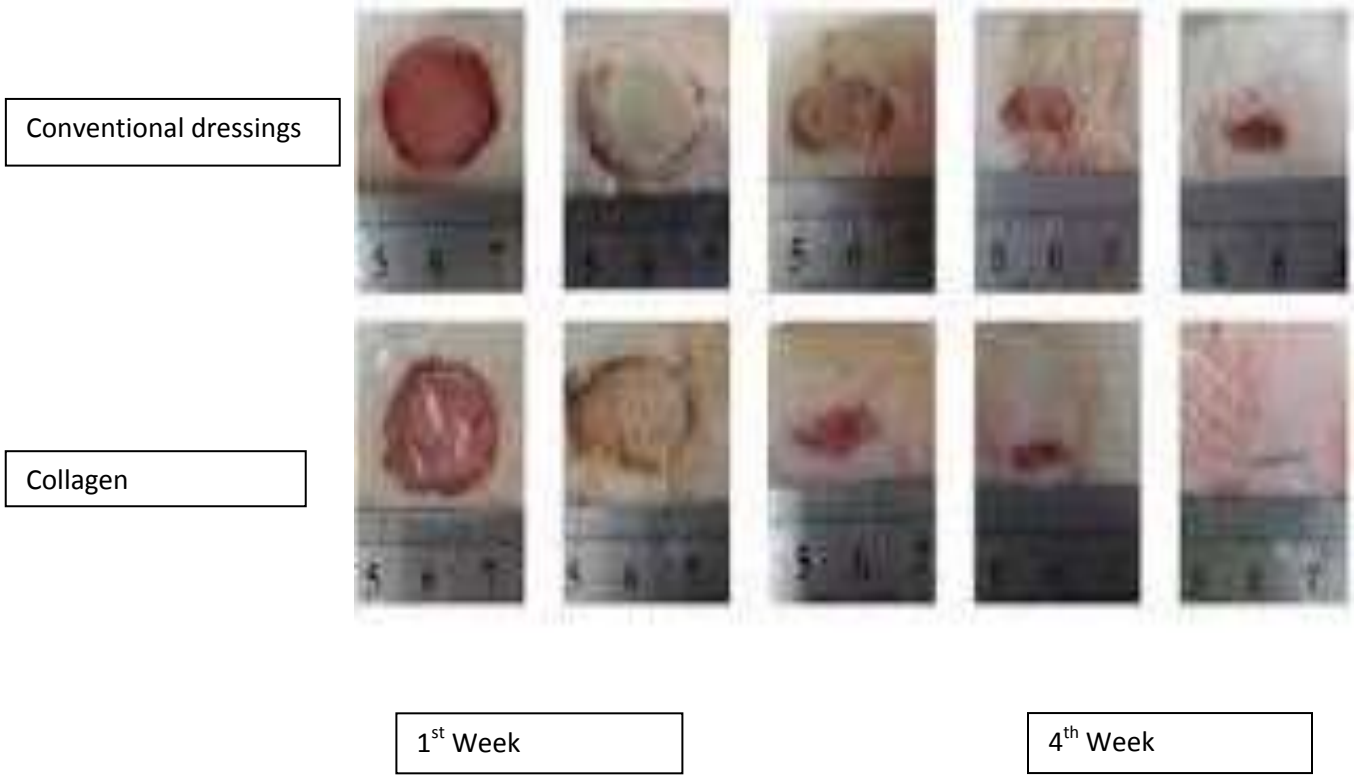
- maximum 30%(30) were post operative,
- 25%(25) were infected,
- 20%(20) traumatic,
- 15%(15) arterial including burgers disease and
- 10%(10) were diabetic.



Healing response in study after 1'st week



Healing response in study after 4'Th week



CONCLUSION

With the use of collegen granules dressings in comparison with the conventional dressings group for treatment of chronic wounds, following conclusion were derived. Collagen granules showed faster and better healing rates , area reduction was statistically significant, there was no adverse effects or reactions seen when collagen were applied over the wounds, venous ulcers heals completely with collagen granules dressings.

DISCUSSION

Collagen has good result in our study. Collagen favors the outcome because of increased defence mechanism by stimulation and differentiation of early and late granulocytes, erythroids and megakaryocytic precursor's cells. Cost of hospitalization and if we can prevent amputations like in diabetes and peripherel vascular disease collagen are very good option for chronic ulcers.

In Saraf SK, Shukla VK,Kaur P, Pandey SS study 92% patient were male, and 18% female, showing higher incidence of chronic ulcer in males ,25% having foot ulcer, and 20% are post operative infected ulcer. In Apligraf Diabetic Foot Ulcer study 15% patient having chronic ulcer were diabetic. In Wood GC study using collagen solution as dressing material and revel faster healing rate in comparison with conventional dressings. In Winter Gd et al. study he using collegen particles as dressing material and observed faster rate of epithelization in wounds. K.M.

Rai, R.P.S. Gambhir, K.K. Maudar , S.K. Mohanty, AFMC Pune study showed maximum healing response in 2nd week and almost complete healing response and epithelization in 4th week with collagen particles as compare to conventional dressing material like povidone iodine that showing near complete or partial healing response in 4th week.

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