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A **Comparative Study of Collagen Granule Vs Conventional Dressing In Case of Chronic Non Healing Ulcer**

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Abstract: *Chronic non healing ulcers are quite complicated and proper management involves an understanding of immunology, psychological ,nutitional issues, the pathophysiology and metabolic interface. wound dressing plays one of the important roles. It is therefore vital that the process and problems of wound healing should be increasingly addressed by all surgeons involved in the treatment of deep wound patients and in the identification of development and use of ideal wound repair material. The following study has been deviced to compare the effectiveness of conventional dressing materials like saline, povidone iodine in the treatment of chronic non healing ulcers, with collagen dressings in patients who are admitted in general surgery ward at govt.rajaji hospital,Madurai. Duration of hospital stay is reduced in collagen group patients; there by decreasing economical and social burden of the patients. Because of the simple application and good tolerance of the collagen granule ,it can be advocated as a temporary biological dressing material in chronic non healing ulcer*

Keywords: *Collagen granule, conventional dressing ,non healing ulcer,comparative study.*

I. Introduction

Chronic non healing ulcers are quite complicated and proper management involves an understanding of immunology, psychological ,nutitional issues the pathophysiology and metabolic interface including all the major organ systems.Chronic ulcers that are difficult to treat include diabetic ulcers, venous ulcers, trophic ulcers, pressure sores and necrotizing fasciitis. These wounds can cause painful lengthy hospital stay, multiple stages of surgeries, permanent disability, prolonged rehabilitation, loss of income and enormous financial burden. Therefore, to tackle these issues, wound dressing plays one of the important roles. It is therefore vital that the process and problems of wound healing should be increasingly addressed by all sugeons involved in the treatment of deep wound patients and in the identification of development and use of ideal wound repair material.The Collagen granule dressing has better advantage over conventional dressing in terms of collagen creation with greater decrease in inflammatory cells during healing period resulting in reduced days of healing, where as conventional dressing has a reduced collagen formation, increased grade of inflammation during the course of healing days with excess exudates formation resulting in maximum days of healing.The following study has been deviced to compare the effectiveness of conventional dressing materials like saline, povidone iodine in the treatment of chronic non healing ulcers, with collagen dressings in patients who are admitted in general surgery at grhmadurai

II. Materials And Methods

The study was a prospective, parallel group, comparative trial among patients admitted with chronic ulcers in General surgery wards at Govt.rajaji hospital ,madurai medical college,madurai.Total sixty patients with chronic non healing ulcers in government rajaji hospital ,madurai were studied and were randomized into collagen or conventional group of 30 each.Study duration was 6 months.

Eligibilty criteria :

Inclusion Criteria :*Patients present with chronic non healing ulcers(Diabetic ulcers,Venous ulcers,Pressure sores,Trophic ulcer,Post operative ulcers,Post traumatic ulcers,Post infectious ulcers)*
Patients willing to give informed consent

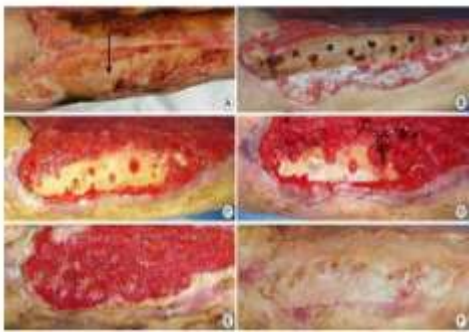
Exclusion Criteria : *clinically moribund patients, Patient refused to give consent ,chronic ulcer with evidence of underlying osteomyelitis, exposed bone, tendon or joint,Malignancy,Arterial ulcer*

The collagen used in this study is a purified reconstituted collagen.Purified collagen refers to collagen,which is free from other components normally associated with it in its native state.purified collagen is collagen which has been reassembled into separate triple helical molecules with or without telopeptide expansion ,made into solution and then regrouped into the desired form. This reconstituted collagen is then cross-linked with tanning agents like gluteraldehyde or chromium sulphate to improve tensile strength , to make it insoluble to decrease its rate of resorption and to lower its antigenicity.

For Conventional Dressing- Managed by saline and povidone-iodine (PVPI) Betadine containing 10% povidone-iodine in water was used for dressing chronic wounds. Collagen Dressing -Thorough wash of the chronic ulcer is done using normal saline. Dead skin and necrotic tissue removed from the ulcer.Under aseptic precautions after thorough wash with normal saline to wash off preservative agents collagen dressing is applied over the wound trimming it with scissors so as to cover the entire area. The collagen granule adherent to the wound within an hour.After collagen granule application,removal of dressing should be done on following days 0,3,5,10,12,15.

Conventional dressing -Thorough wash of the chronic wound is done using normal saline. Dead skin , necrotic tissue removed from the chronic ulcer and dressing was done using gauze soaked with Betadine solution.
Patients of both the groups were also given intra venous broad spectrum anti-biotics and intra muscular analgesics

Chronic ulcer collagen application



Chronic ulcer-5 days after Collagen application

chronic ulcer- collagen application granulation tissue formation

III. Observation And Results

In the present study, 60 patients were taken up for the comparison of collagen dressing v/s conventional dressing.

The following observation was made:

a. *The material was readily available and easily reconstituted for simple and easy application.*
b. *The collagen granule dry, moist, supple and intact when applying over ulcer.*
c. *It was effective in promoting haemostasis.*
d. *It acted as a temporary covering material on the sensitive nerve endings of raw wounds, which reduced pain.*

e. *It acted as a mechanical barrier preventing wound contamination hence reduced infection*
f. *It appeared to be sufficiently robust to withstand trauma.*
g. *The collagen granule did not evoke any antigenic reactions.*
h. *It was useful in inducing granulation and epithelisation and in preventing the infection and abscess formation.*
i. *Good patient compliance was noted as a result of the comfortability of the dressing as it significantly reduced pain and its added value of giving a cosmetically better scar.*

By considering the above points, in this study collagen granule was found to be very suitable alternative to conventional dressing methods & when used judiciously incontrolled clinical situations, collagen granule is biologically acceptable and is,from the clinical point of view, an excellent in wound healing ang early granulation tissue formation.

Most number of the subjects fell in the age group between 40 - 60 years. The mean± SD for test group is (46.17 ± 14.7) and control is (47.7 ± 14.8), so age distribution is statistically similar between the two group with ***P >0.05 insignificant***

The male and female ratio of the test group is 63.3%: 36.7% and the control group is 70%: 30%. Hence sex distribution is statistically similar between the two groups with P > 0.05.It is observed in our study most of the patients duration of ulcer,in both groupsp value–Not significant>0.05 In this study mode of onset of ulcer is not significant in both control and test group; p value. > 0.05In conventional dressing group duration of hospital stay was achieved on an average of 60.3 days where as in collagen dressing it took 36.11 days. P < 0.001 significant. This shows that collagen dressing helps in decreasing the length of hospital stay when compared to conventional dressing The average pain score in the range of 0 to 10 was 6.53 in conventional dressing whereas it was 2.7 in the collagen group. P<0.001 which is a significant reduction in pain score.

In conventional dressing group healing was achieved on an average of 54.37 days whereas in collagen dressing it took 30.27 days. P < 0.001 significant. This shows that collagen dressing helps in decreasing healing time when compared to conventional dressing

Infection was present in 70% of patients in conventional group and in only 20% of the patients in collagen group. P < 0.021significant; and infection was absent in 80% of collegen group and in only 27% of patients in conventional group which indicates lower rate of infection with collagen dressing. 76% of patients in conventional group was undergone SSG and 26% of patients in collagen group wsa undergone SSG, P < 0.046 significant. 23% of patients in conventional group was treated primarily with saline and povidone iodine dressing and 73% of patients in collagen group was treated primarily with collagen dressing, P < 0.037 significant.Patient compliance in the conventional group was good in 33% of cases whereas in collagen group it was 87%, P < 0.043 and bad in 67% of cases in conventional group whereas in collagen group it was 13%. hence there was better compliance rate observed with collagen dressing

IV. Discussion

Chronic non healing ulcer management is a real challenging task to the Surgeon. Wound is devoid of its keratin layer which makes it vulnerable to infections. There is continuous infection, slough formation due to absence of the skin barrier. ulcer area lacks the scaffold of collagen which makes the wound difficult to epithelialize resulting in abscess and osteomyelitis.Exposed nerve endings are vulnerable to external stimuli causing pain.All these features point towards need of a barrier over the burn wound to protect the underlying tissue, and that can act as a scaffold for epithelialization.Over the years the dressing for ulcer has evolved from the traditional exposure method to the biological dressings.Saline or povidone iodine dressing is being used as standard dressing in many centers for chronic ulcers.The denuded areas of skin pose a real challenge to Surgeons who treat traumatic wounds, abrasions and burns. The keratin layer of skin is a very active anti-microbial barrier. Uncovered raw areas are lacking its protection; thereby deferring wound healing by exposing bared areas of subcutaneous tissues to infection.The organised growth of epithelium requires a layer which act as the Platform.. The fact that grafted wound heals faster with less complication than anopen wound has been realized for almost a centuryPovidine iodine dressing for chronic ulcers dressing as one of the tandard dressing in many centres The main use of collagen granules is prevent the action of metalloproteinases. Collagen granule is a biological resources that induce the wound healing via organization of granulation tissue and fresh fibres formation in the wound surface there by make a better atmosphere for increased wound healing. Collagen granules, when applied over the ulcer surface,it not only encourage neovascularisation, but also increase ratebody'sofhealing mechanisms. Moreover, it is comfortable ,well tolerated by subjects,way of application is simple and easy and has the additional advantage of reducing pain.

The number of patients studied was 60 and randomly divided into test group (30) and control group (30). Both the test and control groups were matched regarding their age, sex, onset,duration of ulcer .In addition, there was no significant difference between thetwo groups with respect to age ,sex ,baseline of ulcer size ,duration and onset.Collagen when used over the raw area provides the coveragefor sensitive nerve endings thereby diminishing degree of pain significantly. The average pain score in the range of 0 to 10 was 6.53in conventional dressing and 2.7 in collagen group P<0.001 hence a significant reduction in pain score . Decreasing the infection rate improves the quality of lifeInfection was present in 70% of patients in conventional group and in only 20% of patients in collagen group.P<,0.021 significant I n conventional dressing group healing was achieved on an average of 54.37 days and in collagen group it is 34.27 days .P<0.001 significant. This shows that collagen dressing helps in decreasing healing time when compared to conventional group.The appearance of wound was assessed in about a month.A good woung surface area without infection is important for skin grafting.76% of patients in conventional group was undergone SSG and 26% of patients in collagen group wsa undergone SSG, P < 0.046 significant.23% of patients in conventional group was treated primarily with saline and povidone iodine dressing and 73% of patients in collagen group was treated primarily with collagen dressing, P < 0.037 significant.Hence collagen helps in tissue remodelling and gives abetter wound healing, when compared to conventional dressing.

In conventional dressing group duration of hospital stay was achieved on an average of 60.3 days where as in collagen dressing it took 36.11 days. P < 0.001 significant. This shows that collagen dressing helps in decreasing the length of hospital stay when compared to conventional dressing.Duration hospital stay reduced in collagen group patients; there by decreasing economical and social burden of the patientsPatients were asked to give feed back during followup regarding thecomfortability of the dressing and the resultant scar after healing of the wound. Collagen dressing was considered comfortable as it was alternate interval time pt compliance was good in collagen group 87% and 33% in conventional group.P<0.043 and hence better compiliance

V. Conclusion

Collagen granules by its good characteristics acts like a helps in increase wound healing in the deep wound and offers the perfect dressing in chronic non healing ulcers.Pain was drastically reduced after application of collagen dressing.Collagen dressing also controlled the infection rate by forming a temporary wall between the ulcer and the environment.Most of the subjects ulcers healing with complete epithelisation at a rate faster than conventional dressing. The transformation in the collagen granule test subjects was explained by the information that collagen granule offers an better atmosphere for increaed wound healing in earlier days.Collagen granule provides increased rate of healing, decreases pain ,reduces thelength of hospital stay, decrease the need of analgesics and decreases the related complications.the morbidity of the subjects is decreased collagen granule can be advocated as a temporary biological dressing material in chronic non healing ulcer.

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