



ORIGINAL RESEARCH PAPER

Plastic Surgery

COMPARATIVE STUDY OF POST TRAUMATIC FACIAL ABRASIONS WITH COLLAGEN DRESSING AND CONVENTIONAL CLOSED DRESSING

KEY WORDS: Collagen Dressing, Facial Abrasion, Wound Healing, Wound Dressing

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ABSTRACT

BACKGROUND: Wound Healing is a dynamic process involving soluble mediators, a variety of cells, and extracellular matrix. Oral and maxillofacial trauma often produces open wounds. To bacteria, biological dressings such as collagen are impermeable and establish the most functional interface between the wound surface and the environment. Collagen dressing has advantages in terms of ease of application than traditional dressings and is safe, non-immunogenic, non-pyrogenic, hypoallergenic and pain free. This study aimed to compare the efficacy of collagen dressing and conventional dressing for post traumatic facial abrasions.

MATERIAL AND METHOD: A prospective interventional study among 60 patients with post traumatic facial abrasion attending the department of plastic surgery was included in present study after obtaining the informed consent. All the patients were randomly chosen into two groups of 30 patients each, Group A treated with collagen dressing method and Group B by conventional closed dressing with jelonet and Neosporin ointment.

RESULT: In our study, total of 60 patients were included. There was no significant difference between the age and gender among two groups. The patients treated with collagen membrane showed a significant improvement in the wound healing, reduction of pain, epithelialisation and overall effectiveness scoring compared to conventional dressing method.

CONCLUSION: The collagen membrane dressing showed a faster, better and good healing rate among the study participants.

INTRODUCTION:

Oral and maxillofacial trauma often produces open wounds. (1) The wounds left uncovered are prone for infection, hypertrophic scar and contractures. Therefore need arises to cover these wounds to prevent microbial infection, foreign material contamination, wound contracture and improved healing.

Wound Healing is a dynamic process involving soluble mediators, a variety of cells, and extracellular matrix. (2) Wound result 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. (3)

Wounds difficult to treat include diabetic ulcers, venous ulcers, trophic ulcers, pressure sores and necrotizing fasciitis. 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 epithelialisation and healthy granulation tissue. (4)

Among the newer forms of wound dressings-Biological dressings like Collagen establish the most physiological interface between the wound surface, atmosphere and bacteria-impermeable. Collagen, the most abundant protein in the body, plays a critical role in making adult wound cure effective. Its deposition, maturation and eventual remodelling are vital to the wound's functional integrity.

This study aimed to compare the efficacy of collagen dressing and conventional dressing for post traumatic facial abrasions.

MATERIAL AND METHOD:

It is a prospective clinical interventional study conducted in department of plastic surgery at Basaveshwara Teaching &

General Hospital between periods of January 2016 to January 2020. All the patients attending the department with the post traumatic abrasions on face were included in present study after obtaining informed consent. Patients with lacerated wounds, deep abrasions, complete tissue loss, immunocompromised conditions, extreme age groups, pregnancy and patients with uncontrolled systemic diseases were excluded from present study. The study was conducted after obtaining the institutional ethics clearance. Sixty patients who fulfilled the above criteria were selected for the study. All the systemic examinations and wound inspection were conducted and divided into two treatment groups. Thirty patients received collagen membrane as the dressing material were selected as Group A and thirty patients who received closed dressing with jelonet and Neosporin ointment as the dressing were selected as Group B.

Procedure: with all the aseptic precautions, the wound was thoroughly debrided under anaesthesia. The Group A patients, collagen membrane was placed as a dressing material. The collagen sheet was thoroughly washed with normal saline to remove the Isopropyl alcohol used as a preservative. Then with a non-toothed adson's forceps applied directly on the wound. The area was dried with a hair dryer for the proper edge approximation of the collagen with abrasions. Group B patients, closed dressing was performed with jelonet and Neosporin ointment after wound debridement. Group B patients required regular change of dressing every 48hrs, whereas Collagen dressing patients do not require multiple dressing changes and were discharged early. Both groups of patients were followed up on OPD basis to rule out infection and usually collagen separated 10-14 days as epithelialisation was complete underneath. Both the groups, patients were followed for 4 weeks.

Epithelialisation was noted at the end of 2 weeks and rated as good if entire wound was reepithelialised, fair if nearly or as poor for inadequate wound epithelialisation. The criteria for judgment of haemostatic effect, pain relief, epithelialisation and contracture of wound as poor, fair or good which were given score of 0, 1 and 2 respectively. Effectiveness was

assessed by adding up the scores and a value ranging from 8-10 was considered very effective; score between 5-7 as effective and between 0-4 was ineffective.

Statistical analysis: The collected data was entered in Microsoft excel sheet and demographic details were represented as frequency, percent and continuous variables and Mean, Standard deviation. The unpaired student t-test and chi-square test were used to find out the statistical significance between the variables using SPSS v23. A p-value <0.05 was taken as significant.

RESULTS:

Total of 60 patients were included in present study after obtaining the informed consent from all the participants. In 30 patients dressing was done using collagen membrane method and other 30 by conventional closed dressing. The male preponderance was noted in the present study. (Table 1) Majority of the patients came with the facial abrasion were aged between 31-40 years. (Table 2) There was a significant improvement in the patients treated using the collagen membrane with regards to the pain relief, epithelisation and the overall effectiveness in healing of the wound. (Table 4, 5, 6)

Table No. 1: Gender Distribution

Gender	Collagen Membrane N (%)	Conventional closed dressing N (%)
Female	8 (26.7)	11 (36.7)
Male	22 (73.3)	19 (63.3)
P=0.577		

Table No. 2: Age Distribution

Age (years)	Collagen Membrane N (%)	Conventional closed dressing N (%)
21-30	4 (13.33)	8 (26.67)
31-40	10 (33.33)	11 (36.66)
41-50	8 (26.67)	8 (26.67)
51-60	8 (26.67)	3 (10)
P=0.30		

Table No. 3: Haemostatic effect

Haemostatic effect	Collagen Membrane N (%)	Conventional closed dressing N (%)
Poor (0)		
Fair (1)	5 (16.7)	15 (50.0)
Good (2)	25 (83.3)	15 (50)
P=0.25		

Table No. 4: Pain relief

Pain relief	Collagen Membrane N (%)	Conventional closed dressing N (%)
Poor (0)		
Fair (1)	6 (20)	11 (36.7)
Good (2)	24 (80)	19 (63.3)
P=0.25		

Table No. 5: Epithelialisation

Epithelialisation	Collagen Membrane N (%)	Conventional closed dressing N (%)
Poor (0)		
Fair (1)	2 (6.7)	11 (36.7)
Good (2)	28 (93.3)	19 (63.3)
P<.001*		

Table No. 6: Effectiveness scores

Total	Collagen Membrane N (%)	Conventional closed dressing N (%)
Ineffective (0-4)		
Effective (5-7)	1 (3.3)	9 (30.0)

Very effective (8-10)	29 (96.7)	21 (70)
P<.001*		

DISCUSSION:

Collagen is characterized as an endogenous material that forms an essential structural component in connective tissue, and is of particular importance to the skin. For many years, the role of collagen in healing has been recognized precisely because the result of wound healing repair is always a scar consisting of collagenous fibers. Collagen shapes the molecular variety of protein scaffolding in the body(5)

In present study of the prospective interventional study, regarding the collagen dressing compared with conventional closed dressing method. The dressing procedure using the collagen membrane was superior to the conventional dressing with respect to hemostasis, pain relief, epithelisation and overall effectiveness scoring of the wound healing. These findings were similar with other researchers. (6)

Collagen membrane dressing has an advantage over conventional closed dressing in terms of collagen production with greater reduction of inflammatory cells during healing days resulting in decreased healing days, where as conventional dressing has limited collagen formation, elevated inflammation rates during the healing days and higher exudate formation resulting in increased healing days. In terms of non-immunogenic, non-pyrogenic, a collagen membrane dressing has another benefit over traditional dressing, being safe, easy to apply, hypoallergic and pain free. (4-8)

Other commonly used biological dressing includes amniotic membranes and homograft skin. Human amniotic membrane is easy to obtain, has a low price and provides good wound coverage and has distinct disadvantage compared with other biologic dressing. Although transmission risk of hepatitis, syphilis and HIV is an important concern. (8-11)

CONCLUSION:

Collagen dressing for post traumatic facial abrasion is more effective in comparison with conventional dressing. It has additional benefits of reduced pain, reduced frequency to change of dressing, reduced infection rate, goof tolerance and decreased hospital stay with a good cosmetic outcome.

ETHICAL CLEARANCE:

Obtained from the institutional ethics committee

INFORMED CONSENT:

Was obtained from all the participants

FUNDING: Nil

CONFLICT OF INTEREST: Nil

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