

Outcome of Collagen Dressing in Partial Thickness Burns Patients: An Observational Study

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Abstract

Introduction: In both adults and children, burn injuries are a major public health issue. Burn burns are very painful and typically slowly healing and scarring conditions. To treat burn wounds, dressings play a crucial function.

Aim: The aim of this study was to analyze the outcome of collagen dressing in partial thickness burns patients.

Materials and Methods: This prospective study was performed in Dindigul Headquarters Hospital (Tamil Nadu), Department of General Surgery. Wound examination was performed and all patients were treated with wound swab before collagen was added. The analyzed variables included pain score, infection rate, wound healing rate, resulting scar, and patient conformity.

Results: Out of 100 patients, 64 were male and 36 were female. Based on burns percentage, 18 patients had 10% burns wound, 14 patients had 15% burns wound, 26 patients had 20% burns wound, 17 patients had 25% burns wound, 7 patients had 30% burns wound, 8 patients had 35% burns wound, and 10 patients had 40% burns wound. Mean age was 42.28 years, mean pain score was 2.21 ± 0.98 , mean time taken for healing 12.31 ± 4.12 days, patient compliance was 93%, healing without infection was 92%, and good scar formation was 100%.

Conclusion: Collagen sheet facilitates early recovery, decreases the need for painkillers, and reduces the occurrence of related complications, such as infections.

Key words: Collagen, Dressing, Partial thickness burns

INTRODUCTION

In both adults and children, burn injuries are a major public health issue. Thermal burns, scalding, or direct contact with warm surfaces are the frequent causes of burn injuries. Burn injuries are normal in kids since thinner skin tolerates a smaller time with less heat before full thickness injury happens.^[1] If moist wound bed and sufficient drainage are preserved and no infection remains, a deep partial thickness injury is able to cure. In the absence of the above-mentioned causes, a partial burn wound becomes a total thickness wound.^[2]

Most children suffer from burns involving small areas; 80% of burns occur in children below 5 years old, with

hot spillages of the majority.^[3] A bacterial infection which delays healing and increases pain, as well as the risk of scarring, is one of the key issues with the management of burns.

Burning injuries are the cause in great quantities in both the wound and other tissues for the release of inflammatory mediators. They often contribute to blood vesicles being limited and extended, and the capillary penetration and edema increase significantly. The generalized edema occurs in burned and unburnt skin, in response to changes in starling forces caused by burns. Initially, the hydrostatic pressure of the interstitial skin is markedly decreased. The interstitial pressure rises marginally in the unburned skin. The loss of protein due to the increased capillary permeability raises the interstitial oncotic pressure and the plasma oncotic pressure. The generalized edema happens as a result of these events. The edema is greater in the blamed tissues, as the interstitial pressure is lower.

In extracellular connective tissue, the most essential fibrous protein is the collagen. Collagen is the most abundant and

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all-around protein in the entire animal kingdom. The term collagen was derived from the Greek word “kola,” which means glue plus gene. Of the total protein in the human body, 25% is made up of collagen and about 70–80% is made up of skin. Scientists have gained significant interest in the use of collagen for collagen in recent decades. Various dressing materials such as calcium alginate, hydro-colloid membranes, and fine mesh gas were produced during the last decade. They have an inconvenience since they are bacteria permeable. Biological dressings such as collagen on the other hand create a physiological interface between a wound surface and the environment, and they are impervious to bacteria.^[4] In terms of easing of use and safe, non-immunogenic, non-pyrogenic, hypoallergenic, and pain-free, the collagen dressings have other advantages compared with traditional dressings.^[5,6]

Aim

The aim of this study was to analyze the outcome of collagen dressing in partial thickness burns patients.

MATERIALS AND METHODS

This prospective study was performed in Dindigul Headquarters Hospital (Tamil Nadu), Department of General Surgery. Inclusion criteria: All patients with partial burns of partial thickness of (1st and 2nd grade), <40% of the surface area of the body. Not <24 h of wounds was charred. Inclusion criteria: Patients with full thickness burns, patients with burns with a surface area of >40%. Electric and non-thermal burning patients. Patients are older than 24 h with burn wounds. Examination was performed and all patients were treated with wound swab before collagen was added. Patients with <40% of the total body surface area in partial thickness burns shall be measured. Cases have been treated with dressing in collagen. Time, discomfort, consistency of cure, infection, and compliance with the patient are evaluated in cases. Results obtained based on: The pain score is based on the patient’s own words as a subjective pain. The ranking is 0–10 visually analog. After 24 h of dressing use, the pain score is elicited. 0 means no pain and 10 refer to the highest pain that the patient can handle.

RESULTS

Out of 100 patients 64 were male and 36 were female [Figure 1].

Based on burns percentage, 18 patients had 10% burns wound, 14 patients had 15% burns wound, 26 patients had 20% burns wound, 17 patients had 25% burns wound, 7 patients had 30% burns wound, 8 patients had 35% burns wound, and 10 patients had 40% burns wound [Figure 2].

Mean age was 42.28 years, mean pain score was 2.21 ± 0.98 , and mean time taken for healing 12.31 ± 4.12 days [Table 1].

Patient compliance was 93%, healing without infection was 92%, and good scar formation was 100% [Figure 3].

8% of infections were reported in the study [Figure 4]. 100% of patients had shown good score [Table 2].

DISCUSSION

Deterred areas are therefore delayed by the exposure of susceptible areas of subcutaneous tissues to infection. A layer of collagen is necessary to serve for the orderly growth of the epithelium as the ground upon which it grows and arranges. Denuded areas cannot adequately provide for this, resulting in large scars and even keloids. The intact epithelium provides a protective shield against cutaneous nerves otherwise the nerves are exposed and painful. Wounds left uncovered are vulnerable to infection and more health complications. The rate of infection and the degree of contraction have been well reported to be

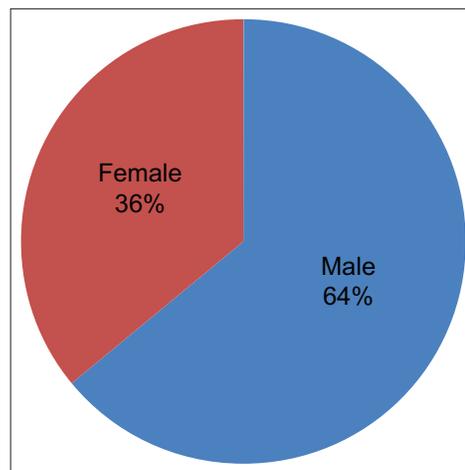


Figure 1: Gender distribution

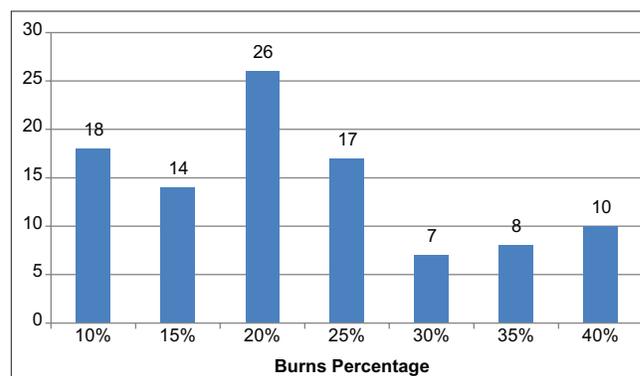


Figure 2: Burns percentage

Table 1: Distribution of various parameters

Parameters	Mean value
Age	42.28 years
Pain score	2.21±0.98
Healing time	12.31±4.12 days

Table 2: Distribution of various parameters

Parameter	Frequency	Percentage
Infection	Absent	92
	Present	8
Compliance	Good	93
	Bad	7
Scar	Good	100

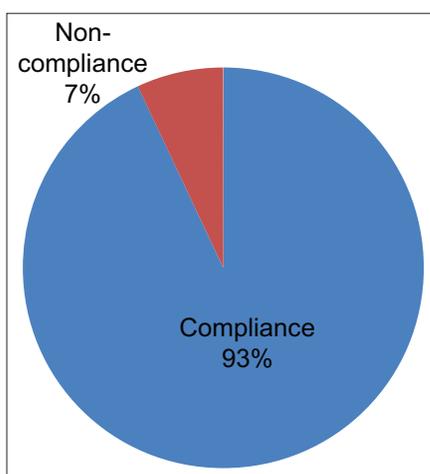


Figure 3: Compliance

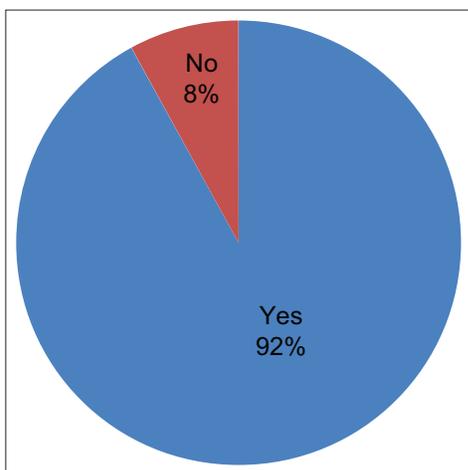


Figure 4: Infection

substantially decreased if injuries are dressed as biological materials rather than exposed or non-biological in cures. Xenogeneic collagen membrane has been found to be ideal for lining mucosa and skin, that is, soft and wound-adaptable, regardless of contour.^[7-10]

In our sample, 8% of patients were infected which indicated a lower rate of collagen dressing infection. None of the cases showed any adverse effects on collagen and proved its safety. This result is similar to Gupta RL study.^[11]

In our study, the average healing time was 12.31 days. This shows that dressing collagen helps to minimize the time for cure. The Gupta RL research, which reveals a healing time of 10–14 days, was consistent with this results.^[11]

About 100% of collagen dressing patients had healthy scars in our study. Collagen thus helps to remodel the tissue and provides a stronger scar than other dressings. That is the same as Demling RH analysis.^[12]

Collagen dressing patient compliance was strong at 93%. Therefore, collagen dressing had a higher degree of conformity observed. This finding was in line with Gerding RL analysis.^[13]

CONCLUSION

Collagen sheet facilitates early recovery, decreases the need for painkillers, and reduces the occurrence of related complications, such as infections. In most people with collagen, the patient’s morbidity is decreased as the resulting scar is strengthened. During a partial thickness burn, collagen may be used as a temporary biological dressing material because of its easy applications and good membrane tolerance.

REFERENCES

1. Helvig E. Pediatric burn injuries. AACN Clin Issues Crit Care Nurs 1993;4:433-42.
2. Mariappan N. Collagen dressing for thermal burns. Sch J Appl Med Sci 2015;3:58.
3. National Burn Care Review. Standards and Strategies for Burn Care. London: National Burn Care Review; 2001.
4. Park SN, Lee HJ, Lee KH, Suh H. Biological characterization of EDC-cross-linked collagen hyaluronic acid matrix in dermal tissue restoration. Biomaterials 2003;24:1631-41.
5. Lazovic G, Colic M, Grubor M, Jovanovic M. The application of collagen sheet in open wound healing. Ann Burns Fire Disasters 2005;18:151-6.
6. Horch RE, Stark GB. Comparison of the effect of a collagen dressing and polyurethane dressing on healing of split thickness skin graft donor sites. Scand J Plast Reconst Surg Hand Surg 1998;32:407-13.
7. Veves A, Sheehan P, Pham HT. A randomized, controlled trial of promogran (a collagen/oxidized regenerated cellulose dressing) vs standard treatment in the management of diabetic foot ulcers. Arch Surg 2002;137:822-7.
8. Nataraj C, Ritter G, Dumas S, Helfer FD, Brunelle J, Sander TW. Extra cellular wound matrices: Novel stabilization and sterilization method for collagen-based biologic wound dressings. Wounds 2007;19:148-56.
9. Nagata H, Ueki H, Moriguchi T. Fibronectin: Localization in normal human skin, granulation tissue, hypertrophic scar, mature scar, progressive systemic sclerotic skin, and other fibrosing dermatoses. Arch Dermatol 1985;121:995-9.
10. Motta G, Ratto GB, De Barbieri A, Corte G, Zardi L, Sacco A, et al.

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- Can heterologous collagen enhance the granulation tissue growth? An experimental study. *Ital J Surg Sci* 1983;13:101-8.
11. Gupta RL. Role of collagen sheet cover in burns-a clinical study. *Indian J Surg* 1978;40:646.
12. Demling RH, Desanti L. Management of partial thickness facial burns (comparison of topical antibiotics and bioengineered skin substitutes). *Burns* 1999;25:256-61.
13. Gerding RL, Imbembo AL, Fratianne RB. Biosynthetic skin substitutes versus 1% silver sulphadiazine for treatment of inpatient partial. *J Trauma* 1988;28:1265-9.

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