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Original Research

Outcome of Burn wound dressing with fresh placenta- An observational study

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***ABSTRACT*:**
Background: Different methods have been used for the care and dressing of the donor site due to the facilitation in the improvement and reduction of wound symptoms and therefore it implies the further possibility of donor site from the same locale. **Aim of the study:** To study outcome of burn wound dressing with fresh placenta. **Materials and methods:** To prepare the amniotic membrane dressing, a placenta of healthy women who underwent C-section delivery was used. All steps of processing the placenta were done in the laminar hood in the clear room. After processing, the amnion was stored in special containers and freezing temperature of -80 degree C. Physical examination was performed for all patients and their medical history was recorded. The burn degree was diagnosed clinically. During the hospitalization period all patients were examined for infection and discharge. They were followed-up over time intervals of 7, 30, and 90 days to screen the wound healing and scar forming. **Results:** In the present study, a total of 40 patients with burn wounds were included to study the effect of fresh placenta as dressing over burn wounds. 21 patients were males and 19 were females. The mean age was 43.69 years. We observed that the pain score declined rapidly in case group as compared to the control group. The results on comparison were found to be statistically significant. **Conclusion**: Within the limitations of the present study, it can be concluded that the fresh placenta provides rapid reduction of pain in patients whose wound was dressed fresh placenta. The results are statistically significant.
Keywords: Wound dressing, placenta dressing, burn wounds, pain score.

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INTRODUCTION:

More than 40% of all medically treated burns are a result of occupationally based accidents. [1] Work-related hazards give way to nonfatal combination injuries in which the affected limb may suffer both thermal- and crush- or high-pressure injection-related tissue damage. [2] Partial and full-thickness burn injuries to the upper and lower extremities are the most common injuries and require early post-injury care to avoid functional impairments resulting from contracture or amputation. [1,2] Individuals without geographic access to a regional burn center may rely on emergency department assessments with outpatient referral for definitive treatment and rehabilitation. [3] In the classic manner, the treatment of burn is via daily washing of the wound, removal of the dead tissue and antibiotic dressing till the formation of granulation tissue and later grafting. [4] Different methods have been used for the care and dressing of the donor site due to the facilitation in the improvement and reduction of wound symptoms and therefore it implies the further possibility of donor site from the same locale. [5] Among these the use of dry gas, gas dripping with an antibiotic, two or multilayer dressing, the vaseline gauze which is presently utilized in the scald department and amniotic membrane as biological dressing for treatment or care of some wounds can be mentioned. [6] Hence, the present study was conducted to study outcome of burn wound dressing with fresh placenta.

MATERIALS AND METHODS:

The present study was conducted in the Department of General Surgery of the medical institution. The ethical clearance for the study was approved from the ethical committee of the hospital. A total of 40 patients with third-degree chemical or thermal burn referred to our department for further management were included. Third-degree chemical or thermal burn in an anatomical area or in two mirror organs except for hands and head and neck with the minimum size of 10* 3 cm or 5 * 3 cm, respectively, were our inclusion criteria. Patients with severe vascular trauma and amputation indication, burn in areas of hands and head and neck, the inability to follow-up and patient dissatisfaction with the use of amniotic membrane were our exclusion criteria.

To prepare the amniotic membrane dressing, a placenta of healthy women who underwent C-section delivery was used. All steps of processing the placenta were done in the laminar hood in the clear room. After processing, the amnion was stored in special containers and freezing temperature of -80 degree C. Physical examination was performed for all patients and their medical history was recorded. The burn degree was diagnosed clinically. Initial treatments include cleaning the burn area with a sterile saline solution, debriding tissues that have necrosis and removing foreign particles from the burn area, were performed. Information, pain score and the Vancouver Scar Scale Score form were allocated to each patient. Split thickness skin graft was harvested from the donor site. Depends on some parameters such as age, sex and physical conditions of each patient, the donor site is a difference. First of all, we divided the burn area into two sections. Skin mesh graft was placed on both sections to cover the burn area. Then the first section with a minimum size of 5*3 cm was dressed by amniotic membrane dressing enriched with stem cells and the second one with the same size was dressed by sterile Vaseline gauze. Both of them were fixed by using sterile gauze in order for the graft to be taken. During the hospitalization period all patients were examined for infection and discharge. They were followed-up over time intervals of 7, 30, and 90 days to screen the wound healing and scar forming.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistically significant.

RESULTS:

In the present study, a total of 40 patients with burn wounds were included to study the effect of fresh placenta as dressing over burn wounds. Eight patients were males and 32 were females. The mean age was 43.69 years. No comorbidity was present in 30 patients. Hypertension and DM was present in 6 patients. Only hypertension was present in 4 patients. [Table 1] Table 2 shows the comparison of pain score of case and control group at follow up period of 7 days, 30 days and 90 days. We observed that the pain score declined rapidly in case group as compared to the control group. The results on comparison were found to be statistically significant. [Fig 1]

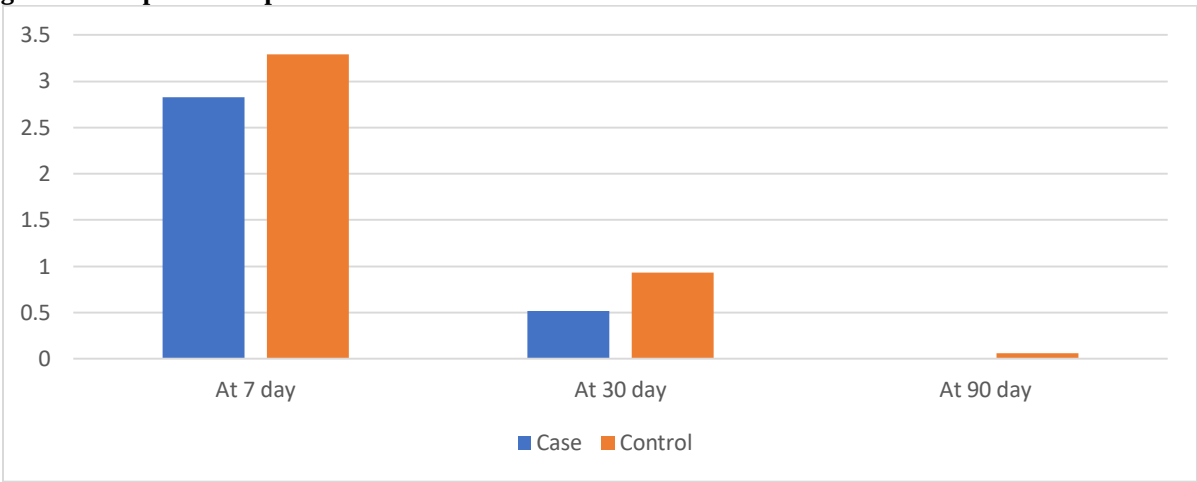
Table 1: Demographic data of the participants

Variables	Numerical values
Total no. of patients	40
No. of male patients	8
No. of female patients	32
Mean age (years)	43.69
Diabetes and hypertension present	6
Only hypertension	4
No comorbidity	30

Table 2: Comparison of pain score of case and control group

Follow up time	Case	Control	p-value
At 7 day	2.83	3.29	0.005
At 30 day	0.52	0.93	
At 90 day	0.002	0.06	

Figure 1: Comparison of pain score



DISCUSSION:

In the present study, we studied the outcomes of fresh placenta used as a wound dressing for burn wounds. A total of 40 patients were studied, 8 were males and 32 were females. The participants' age was more than 18 years and the mean age was 43.69 years. Furthermore, we observed that placenta dressing provided significant pain relief to the patients as compared to control group. The results on comparison were statistically significant. Johnson EL et al [7] addressed several complications associated with burn injuries—contractures, scar formation, and pain—a viable cryopreserved placental membrane (vCPM) (Grafix—PRIME, Osiris Therapeutics, Inc., MD) retaining the anti-inflammatory, anti-fibrotic, and antimicrobial properties of fresh placental tissues was chosen for clinical use in the 2 cases reported, where both patients had restricted access to the regional burn center. Two cases of work-related extremity burns presented to a local rural hospital for immediate post-injury assessment. The 1st case was of a man who sustained a 55.4cm2 full-thickness 3rd degree thermal burn with exposed bone and tendon, to the left dorsal forefoot after having an industrial pressure washer caught on his work boot. The 2nd case was of a female who sustained a 4.7cm2 full-thickness 3rd degree crush burn to the dorsum extensor surface of her dominant hand's index finger after applying 80-pounds per square inch of heated pressure from a hydraulic press. The report that both burns reached timely wound closure, and patients regained full range of motion of the affected limb, allowing for early return to work. The average number of allograft applications was 7.5, allowing both patients to return to work in an average of 63.5 days without adverse events or post-treatment complications. They concluded that the incorporation of this product in the treatment of these complex burns prevented amputation in one patient, and skin autografting and potential index finger contracture-formation in the second patient. The incorporation of vCPM in burn management may offer a new approach to outpatient burn management and may mitigate several of the complications seen post burn injury, leading to favorable patient outcomes. Sun XP et al [8] reported the case of a 53-year-old female with chronic plantar fasciitis for whom both conservative therapies and surgical treatments of 1 year's duration had previously failed. After open revision with implantation of viable intact cryopreserved human placental membrane, the patient was able to resume her full-work duty with minimal symptoms at the 12- and 24-month follow-up examinations.

Eskandarlou M et al [9] studied the efficacy of amnion used as biologic dressing for donor site of skin graft in improvement of pain, move score and the risk of local infection. Study was done as clinical trial over 32 admitted patients in burn department of Beasat hospital. Amnion was prepared in elective caesarean section after rule out any placental site for risk of torch and viral infection. Skin graft was taken from two sites in every patient. One site dressed with amnion and another with routine dressing. Then two sites were compared about severity of pain, move score, infection and time of dressing sloughing. Fourteen patients were women and 18 men. Mean score of pain and movement up to fourth and fifth post operative day respectively was less than control site. No difference is seen about infection and dressing slough in two sites. They concluded that use of amnion for dressing of donor site probably cause rapid epithelialisation and wound healing and can improve pain and move score in early post operative days. Accordingly it is expected to need less analgesia and low rate of immobilization and following complications and earlier discharge of patients. Salehi SH et al [10] compared two methods of wound dressing in donor sites of split-thickness skin graft in patients undergoing burn wound reconstructive surgery. Forty-two

consecutive patients with second- and third-degree burns with a total body surface area between 20 and 40 % were enrolled in this randomized clinical trial conducted in Motahari Burn Hospital in Tehran, Iran. In each patient, two anatomic areas with similar features were randomly selected as intervention and control donor sites. The intervention site was dressed with amniotic membrane, whereas the control site was treated with Vaseline-impregnated gauze. Wounds were examined daily by expert surgeons to measure the clinical outcomes including duration of healing, severity of pain, and infection rate. The mean ± SD age of patients was 31.17 ± 13.72 years; furthermore, burn percentage had a mean ± SD of 31.19 ± 10.56. The mean ± SD of patients' cooperation score was 1.6 ± 0.79 in the intervention group compared with 2.93 ± 0.71 in the control group, revealing a statistically significant difference. Duration of wound healing was significantly shorter ($P < 0.05$) in the intervention group (17.61 ± 2.56 days) compared with the control group (21.16 ± 3.45 days). However, there was no significant difference in terms of wound infection rate between donor sites in the control and intervention groups. They concluded that amniotic membrane as an alternative for dressing of skin graft donor sites provides significant benefits by increasing patients' comfort via diminishing the number of dressing changes and facilitating the process of wound healing.

CONCLUSION:

Within the limitations of the present study, it can be concluded that the fresh placenta provides rapid reduction of pain in patients whose wound was dressed fresh placenta. The results are statistically significant.

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