

*Research Article***Role of amniotic membrane in healing of skin graft donor site****Abdou M. Darwish, Ahmed M. Attia and Abd Algawad M. Mostafa**

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Introduction

Split thickness skin grafting is a frequently used reconstructive technique for resurfacing of tissue loss due to surgery, trauma, and burns. Skin graft donor site is a source of pain and discomfort for the patients and may cause significant morbidity and result in hypertrophic or even keloid scar. The challenge in managing such a wound is to promote healing while minimizing adverse effects and complications, such as bleeding, pain, infection, and hypertrophic scar formation⁽¹⁾.

There are many techniques that manage these situations, the paraffin-impregnated gauze dressing has for years been the primary choice of surgeons for the coverage of split skin donor sites, however the use of paraffin gauze for skin graft donor sites is commonly associated with wound adherence with consequent pain and trauma upon removal⁽²⁾.

Skin substitutes provide temporary wound coverage and reduce the infection risks, prevent fluid and electrolytic losses, control pain and improve wound healing⁽³⁾. A variety of biological and bioengineered skin substitutes consisting of either intact human skin, animal skin, or a combination of biological and man-made materials are available⁽⁴⁾. Different types of skin substitutes to provide a protective barrier and facilitate epithelialization of the donor site have been reported⁽⁵⁾. However, performance of these skin dressings depends on their adsorbent capability without promoting potential bacterial infection and allowing efficient re-epithelialization, non-adherence, pain and discomfort levels, and ease of wound care⁽⁶⁾.

Amniotic membrane is one of the most widely used temporary biological skin substitute. Ease of availability, negligible cost and facilitated wound healing makes this temporary biological dressing generally superior to either cadaver allograft skin or xenograft skin. The epithelium in human amniotic membrane provides good

protection from evaporative loss, as well as barrier function, whereas the fibronectin and collagen matrix provide some dermal function. It is used in a variety of clinical applications and as a dressing for burns and chronic ulcers split thickness skin donor site⁽⁷⁾. It has advantages such as pain relief, prevention of infection, maintenance of a moist environment to promote healing, good adherence to wounds and simple handling.

Laboratory investigations have revealed that the basement membrane (BM) of amnion shares major BM components with human skin, and the BM zone resembles human skin morphologically. The epithelial side of denuded amnion has been shown to support the proliferation, spreading, and differentiation of corneal and bronchial epithelial cells. Furthermore, the stroma of amnion can serve as a dermal matrix in which fibroblasts show good adherence and proliferation. After cleansing the donor bed of blood, the amniotic membrane is applied) & then covered with Vaseline gauze simple dressing. The amniotic membrane adheres to the wound bed and peels off, when the wound is completely epithelialized⁽⁸⁾.

Aim of the work

The aim of this study to evaluate the efficacy of amniotic membrane in the management of skin graft donor site and its role in acceleration of healing.

Patients & Methods

A prospective study was carried on 20 patients scheduled for split thickness skin graft, with post burn or post traumatic rowa area, subjected for application of amniotic membrane on the half area of donor site, collected from:

- 1. Minia university hospital.**
- 2. Minia health insurance hospital.**

Inclusion criteria:

- 1- Age of patients ranges 5:50 years old

- 2- Good general condition of the patient
- 3- Amniotic membrane obtained from Caesarean section patients, sero-negative for hepatitis and venereal diseases.
- 4- Amniotic membrane reserved in normal saline

Exclusion criteria:

- 1- Immunocomperimized patients (DM, Heart diseases, on corticosteroids, liver diseases, renal failure).
- 2- Amniotic membrane obtained from patients with history of jaundice, premature ruptures of membranes, endometritis, malaria and toxemias.
- 3- Amniotic membrane from donor underwent normal labor.

All members included in this study (donors or patiens subjected for application

of amniotic membrane)were subjected for the following :

- 1-thorough medical history to excluded history of fever ,malaria ,jaundice, endometritis .
- 2-clinical examination to exclud any chronic illness or sexually transmitted diseases, organomegally .
- 3-lab investigations in the form of: CBC, PT PC INR, ALT, AST. serum urea & creatinine, HCV, HBV and HIV markers, RBS

Results

Table (1) shows demographic data of the studied group. Age ranged from 7-50 years with mean value 32.45±4.236 years. Male cases were 16(80%) while female cases were 4(20%).

Table (1): Distribution of studied sample according to patient’s demographic data.

Age (years)	Number	Percent
≤30	10	50
>30	10	50
Range	7-50	
Mean±S.D.	28.65±16.455	
Sex		
Male	16	80
Female	4	20

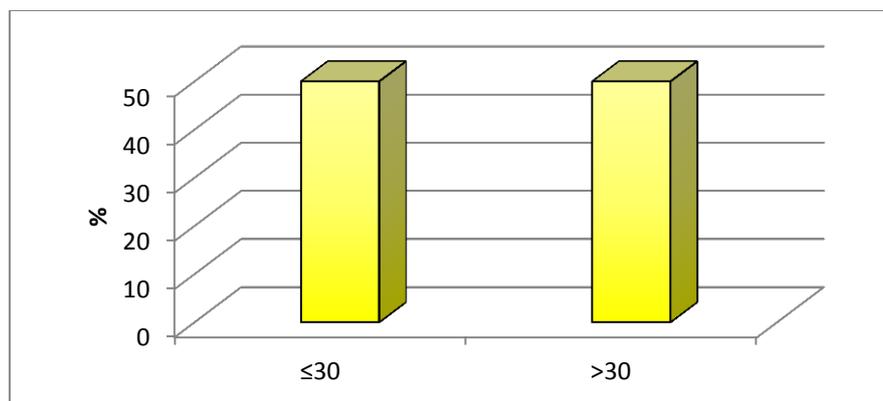


Figure (10): Distribution of studied sample according to patient’s age.

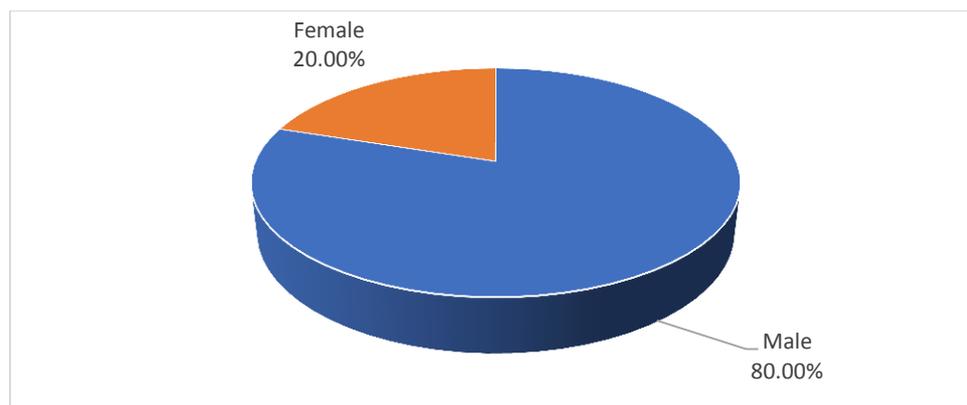


Figure (11): Distribution of studied sample according to patient's sex

Table (2) shows Recipient Site of the studied group show that 9(45%) their site was in leg, 5(25.0%) their site was in foot, 2(10.0%) their site was in arm, 1(5.0%) their site was in ankle, 1(5.0%) their site was thigh, 1(5.0%) their site was scalp and 1(5.0%) their site was penis.

Discussion

The optimal dressing for the split-thickness skin graft donor site continues to be a matter for debate. Generally speaking, the ideal donor site dressing encourages rapid reepithelialization, minimizes pain, decreases the risk of infection, and curtails scarring. In general, dressings that promote a moist wound environment until reepithelialization occurs (at least 7 days) have been shown to improve rates of healing and pain control⁽⁹⁾

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Our study was carried on 20 patients scheduled for split thickness skin graft, with post burn or post traumatic rowa area, subjected for

application of amniotic membrane on the half area of donor site This study showed that the use of amniotic membrane as a dressing for split thickness graft donor site accelerate healing and reduce healing time, when compared to conventional dressing.

Time of healing of the studied group show that time of healing for conventional dressing was ranged between 7 – 16 days with a mean value of 12.10 ± 1.714 days while time of healing for amniotic membrane dressing ranged between 7 – 14 days with a mean value of 10.75 ± 2.023 days. There were statistically significant differences between the two types of treatment where $P=0.035$.

Compared to the work of Branski et al. in his cohort of 120 patients, amniotic membrane proved to accelerate healing time and yield a lower rate of local reactions or infections, presenting a great advantage over the Tegaderm group. In our study we also found that the rate of healing time was accelerated in the amniotic membrane over the conventional dressing.⁽¹¹⁾

The results of Kuitian and Obendorf carried on 46 pt indicated that partial thickness burns treated with amniotic membrane showed a re-epithelialization rate faster than those burns which were treated with polyurethane membrane. He also found there were differences in the rate of wound infection after treatment of burns. An earlier study evaluating reepithelialization of partial thickness burns treated with amniotic membrane suggested a more rapid re-epithelialization. At 7 days, percent of re-epithelialization was greater in the amniotic group (65.0%) than in the Tegaderm group (37.6%).⁽¹²⁾

Conclusion

Amniotic membrane as an alternative dressing for skin graft donor sites provides significant benefits through being cost effective as it accelerates wound healing, and has less frequent dressing.

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