

“AMNIOTIC MEMBRANE AS A BIOLOGICAL DRESSING OVER WOUNDS”

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The loss of protective layers of epidermis renders a patient vulnerable to invasion from pathogenic organisms and losses of fluid, electrolyte, protein, evaporative heat etc. Undoubtedly, the prompt provision of skin over raw areas of body is the crying need of management. But, sometimes such procedures are delayed due to either poor general health of the patient or paucity of sufficient donor area from where skin grafts may be taken. In such conditions, the treating surgeon has to take recourse to some sort of temporary dressing which may ameliorate the suffering of the patient by minimising infection, pain etc. The ordinary dressing with antibiotic tulle-grass or antiseptic agents has not been found capable of holding the fort for long. Hence, the search for some sort of dressing which may prove to be more useful in providing quick healing to the patient with minimal suffering.

Brown et al (1953) used fresh homografts taken from cadavers as a temporary “biological dressing” over extensive burns and areas having skin loss. The device was found to lessen the surface infection and decrease the losses of fluid etc.

Rapport et al (1970) used xenograft obtained from pigs in a number of burn cases. They found it almost as effective as

a biological dressing and also it could be obtained in any amount. But; its survival over the raw areas was less and the visibility of healing occurring underneath it was poor. Also the process of lyophilisation and freezing required for its preservation made it quite extensive.

Douglas (1952), Pigein (1960), Robsen (1973) and Singh (1975) have used amniotic membrane as a temporary biological dressing over wounds with good results. Amniotic membrane is ectodermal in origin and is like an extension of the skin of the fetus. The high birth rate in our country makes the membrane readily available without any cost to the patient. In those places where labour room facilities are not available, the membrane can be preserved in ordinary domestic freeze at 4°C for about a month (Diano et al, 1960) without deterioration. We have undertaken the present study to find out the suitability of amniotic membrane as biological cover over wounds under our conditions.

Material & Methods

Sixty patients having wounds of either thermal, traumatic or infective origin were taken up for study. Care was taken to include patients of different age group and sex.

The amniotic membrane was obtained fresh from labour room after aseptically delivering placenta in sterile bowls. Only healthy membranes were dissected out aseptically and from placenta and were first washed in a weak solution (one part in 1000 of saline) of cetavalon and then passed through four changes of normal saline. Finally, the membranes were stored in sterilized glass jar filled with normal saline.

The membrane was applied over wounds without any anaesthesia in the ward with due aseptic and antiseptic care after cleaning the wound of all exudates, ointments etc. with normal saline. The amnion was spread over the wound with the chorionic surface next to the wound. The membranes were allowed to stay over the wound till either they spontaneously separated, or accumulation of pus underneath, or sloughing indicated need for their removal. Ordinarily the membranes needed change every 5th day over deep wounds. The membrane, after application was kept exposed for inspection. In circumferential wounds a light dressing was required to keep them over the raw area. Everyday during ward rounds the general condition of the patient, particularly pain over the wound site pyrexia, etc, was taken note of. The membrane was inspected for the evidence of any change in colour, collection of exudates underneath, putrefaction, or spontaneous separation.

Everytime, before applying the membrane a definite quantity of pus for culture was taken. Colony counting and enumeration of bacteria per ml. of pus was done.

Observation and Discussion

Out of a total number of sixty cases 40% belonged to the age group 25-40 years, and

the rest were from other age groups. So far the sexes were concerned 58% belonged to the fair sex.

Table 1

Surface extent of wounds	No.	Percentage
Mild (below 100 sq. cm.)	20	33.3
Moderate (between 100-200 sq. cm.)	28	46.7
Major (above 200 sq. cm.)	12	20.0
Total	60	100.00

The extent of wound taken up for study ranged between 45 sq. cm. to 350 sq. cms. Broadly the wounds were divided into mild (below 100 sq. cm.), moderate (between 100-200 sq. cm.) and major (above 200 sq. cm.) for facilities of observation. The table No. 1 gives the number of cases of each type taken up for study. Sixty Five percent of the wounds were superficial having only partial damage to skin.

Table 2

Cause of injury	No. of cases	Percentage
Burns	48	80.0
Trauma	7	11.6
Infection	5	9.3
Total	60	100.0

Table 3

Day of application of amino graft.	Complete Separation		adherence from margin in		Complete separation	
	No.	%	No.	%	No.	%
5th day	150	100.0	Nil	—	Nil	—
10th day	30	20.0	115	76.6	5	7.5
15th day	2	1.3	Nil	—	148	98.0



Fig. 1 : Application of amniotic membrane over a thermal burn wound of thigh.



Fig. 2 : Wound showing almost complete healing.



Fig. 3 : Biological dressing by amnion over a burn wound of trunk.

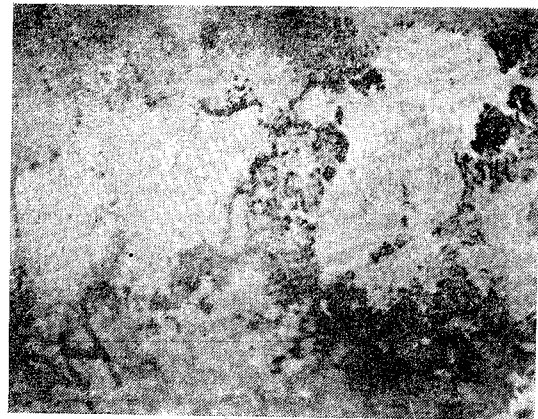


Fig 4. : Healing occurring from multiple centres.



Fig. 5 : Another burn wound of thigh covered by amnion.



Fig. 6 : Islets of healing.

Eighty percent of the cases taken up for study were cases of burn injury and rest had either traumatic or infective origin.

In the present study a total number of 155 amnion grafts were applied over wounds in 60 patients out of which all showed complete adherence to the wound upto the 5th day of application, 5 percent showed separation from margin on 10th day of application and the graft could survive upto 15 days only in 2 percent of the cases. In the rest of the cases rejection was evident from 5th day onwards.

Table 4

Colour change	Duration after application		
	0-5 days	5-8 days	8-10 days
Glossy light pink	140	5	--
Whitish	4	22	20
Greyish white	6	103	101
Light green	--	20	29

The membrane maintained its glossy light pinkish appearance upto 5th day in 140 out of 150 grafts. Its colour changed to white in 4 cases and greyish white in rest of the cases. On 10th day the colour of 121 grafts became white to greyish white and it became light green in the remaining cases.

Table 5

Depth of wound	Amnion grafting		Extent of healing			
	Total No.	Percentage	Compleat		Partial healing	
			No.	%	No.	%
Superficial	95	63.3	93	98.0	2	2.0
Deep	55	36.7	5	9.0	50	91.0

In the present work 95 amniotic grafts were applied over superficial wound and 55 over deep wounds. Rapid healing was seen in almost all superficial wounds and a slow to moderate attempt at healing from the margins

was also seen in deep wounds. Complete healing was obtained in five cases having deep wounds of less than one inch in diameter.

Table 6

Bacterial count	Initial count	After amnion grafting 5th day count	10th day count
Below 10 mill./ml.	--	18 percent	44 percent
Between 10-15 mill./ml.	48 percent	40 "	38 "
Between 15-20 mill./ml.	40 "	35 "	16 "
Above 20 mill./ml.	12 "	7 "	2 "

Out of the 60 cases taken up for observation 48 percent had bacterial count ranging from 10-15 million/ml., 40 percent had 15-20 mill./ml. and 12 percent had above 20 million/ml. over the wounds on the first day of study. It decreased respectively to 38 percent 16 percent and 2 percent on 10th day of study after applying one or two amnion grafts and in 44 percent of the cases bacterial count dropped down below 10 million/ml.

Summary and Conclusion :

1. Sixty cases drawn from different age groups and sexes having wounds resulting from burn injury or trauma or infection were taken up for the study of the utility of amniotic membrane as temporary biological cover.
2. The membranes usually survived upto five days on even deep wounds or severely infected wounds after which it had to be replaced. The deep wounds also had healing from margins.
3. In all cases bacterial counts dropped down following amnion grafting.

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