

AMNIOTIC MEMBRANE DRESSINGS IN THE TREATMENT OF CHRONIC ULCERS

Dr. Suhas V. Abhyankar, M.S.M.C.P.S.

Dr. U. Anand Kini, M.Ch.

Dr. N.C. Ananthakrishna, M.D.

KEY WORDS

Amniotic Membrane, Wound dressing.

ABSTRACT

Twenty cases make basis of observations made while being treated for chronic non-healing wounds other than those due to thermal injury (Burns). Stored Amniotic Membrane is used to cover these wounds. Results are presented.

INTRODUCTION

In a normal working day surgeon spends several hours, on dressing wounds that are being treated conservatively, to achieve wound closure. These dressings are an unpleasant experience for patient since often it causes pain and has to be repeated at regular intervals. Innumerable varieties of dressings and dressing materials have been tried since time immemorial to achieve early healing and to minimise pain. No one as yet has come up with an "Ideal dressing", and the search goes on. Ideal wound dressing for chronic ulcer should be low

cost, easily available and one that will relieve pain and achieve early healing.

MATERIALS AND METHODS

Twenty cases with chronic non-healing ulcers are included in the present study. There were 17 male and 3 female patients in the age range of 20 to 80 yrs. Nineteen of them had ulcers of more than 2 months duration, the longest being 1 1/2 years. The causative factors were found to be trauma in 9, diabetes mellitus in 3, thrombo angitis obliterans in 4, and Varicose veins, Hansens disease, Filariasis and Pressure Ulceration in the remaining four.

Fresh amniotic membrane is collected at the time of Cesarean section. Muconium stained or foul smelling membranes are discarded. Placentas with membranes intact, are washed in sterile saline to remove clots. The amnion is separated from the chorion, spread on sterile gauze, rolled up and stored at 4 degree celcius in sterile saline to which one ampule of crystalline penicillin and/or gentamycin is added. Any membrane stored beyond 9 days is subjected to Bacteriological culture. Membranes stored for more than 15 days often became friable and unsuitable for use. The longest period of storage was for 3 weeks.

The amniotic membrane is applied to cover ulcer completely. Multiple small cuts are made on the membrane and then covered with gauze moistened with saline and dressing is completed. In all cases the rough surface of the amniotic membrane is apposed to the ulcer bed. The dressings are changed daily for a period of 7 days. After the last dressing, post application swab and biopsy is taken from the edge of the ulcer.

The biopsy material was homogenized in tissue vertex homogenizer with all aseptic precautions.

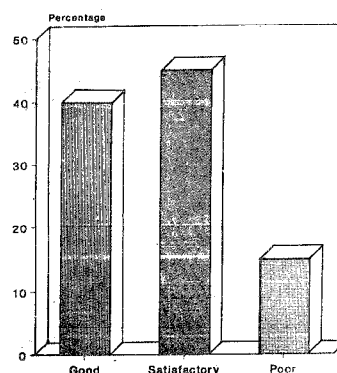
Smears were stained with grams stain and cultures were done on thioglycolate, blood agar and Macconkeys media. Intracellular bacteria and proximity of bacteria to the inflammatory cells were considered to signify infection. Surface colonization without inflammatory cells were not taken into consideration.

OBSERVATIONS

The results were divided into three groups - 1. Good. 2. Satisfactory. 3. Poor. Good results were observed in 8 cases. Complete healing with dressings in 4 cases and where grafted, graft take was above 90% in 4 cases.

GRAPH-1

RESULTS



Satisfactory results meant reduction in ulcer size with appearance of healthy granulation and neo-epithelium and absence of slough. Nine cases (45%) showed satisfactory results.

Poor results implied no change in ulcer size, granulation, epithelium or slough. Three cases showed poor results.

Effect of amniotic membrane dressings on granulation tissue, epithelialization, ulcer size and infecting organism was studied.

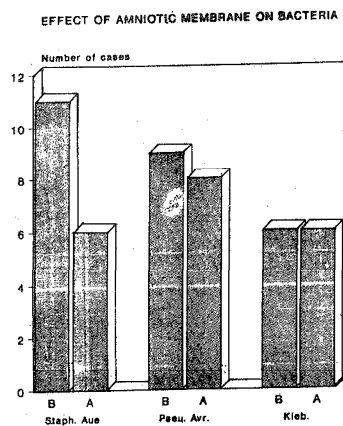
Granulation tissue : The amniotic membrane shows significant effect on granulation tissue as

early as the 3rd day. New granulation tissue formed in 17 cases. In 3 cases where there was excess of granulation, a suppressive effect was observed.

Epithelialization : Epithelialization from margins is noticed from the 2nd day. In 6 cases the effect was excellent.

Size of the Ulcer : There is considerable reduction in the size of the Ulcer at the end of 7 days. 3 ulcers showed no change in size. In 17 cases the ulcer size was reduced by 1.5 cm to 2 cm and four of these proceeded to complete healing spontaneously within 3 weeks.

GRAPH-2



Infecting organism : In 11 cases staph. aureus was cultured from pre-application biopsies. The post application biopsy in 5 of these cases showed no growth of staph - aureus while the remaining 6 showed marked reduction in colony count. Pseudomonas and klebsiella were cultured in 9 and 6 cases respectively from pre-application biopsy specimens. The same organisms were observed with reduced colony count in the post application biopsies of 8 and 6 cases.

DISCUSSION

Experimental studies on infected rat burns by Robson and associates (1972-1973) showed that

amniotic membrane dressing was as effective as split skin isograft in decreasing bacterial levels and is superior to allografts and xenograft. These results were confirmed by them in another study of 50 wounds (1973). It was also found that pain was markedly relieved as soon as the membranes were placed on the wound.

Other workers (Colocho et al 1974, Quinby et al 1978) have found that amniotic membrane acts as a physiological dressing for burns, reducing fluid, protein, heat and energy loss in addition to relieving pain.

Amniotic membrane has, however, been rarely used in the management of chronic ulcers. Bennett et al (1980) chronic leg ulcers in 15 patients for autografting, with amniotic dressings for 5 days. In 13 patients, vascular response filled the ulcer bed with granulation tissue. Eight of the grafts appeared satisfactory after 2-10 months. Faulk et al (1980) studied biopsy specimens from leg ulcers of 15 patients before and after amniotic membrane application for 5 days. They suggested that the vascular response was due to the presence of angiogenic factors in human amnion. Formation of excessive granulation tissue was however, prevented with every change of the membrane dressing which acted as mechanical debridement.

In the present study beneficial effects are seen in 17 out of 20 cases. Granulation tissue is optimized, epithelisation progresses and size of the ulcer reduces. Complete healing occurred in 4 cases and skin grafting became feasible in 4 others. There is suppressive effect on the bacterial population particularly staph aureus.

CONCLUSION

In conclusion, amniotic membrane is a low cost and available material that can be effectively used to dress chronic ulcers to bring about early wound closure.

AUTHOR NAMES AND ADDRESS

Dr. U. Anand Kini, Asst. Professor

Dr. N.C. Ananthakrishna Professor

Dr. Suhas V. Abhyankar, Senior Resident.

K.M.C. Manglore, Dept. of Plastic Surgery,

REFERENCES

1. Bennet, J.P., Matthews, R., and Faulk, W.P. **Treatment of chronic ulcer of leg with human amnion** Lancet 1980, 1153-1155.
2. Bose, B.: **Burn wound dressing with human amniotic membrane.** Annals of Royal college of Surgeons. England. 1979; 61 : 444-47.
3. Colocho, G., Graham, W.P., Green, A.E., Matheson, D.W., and Lynch D. **Human amniotic membrane as a physiological wound dressing.** ARCHIVES OF SURGERY. 1974; 109 : 370-73.
4. DAVIS, J.S. **J Skin transplantation with reveiw of 550 cases.** JOHNS HOPKINS HOSPITAL REPORT 1910; 15 : 307-95.
5. FAULK, W.P. STEVENS, P.J., BURGOS, H., MATTHEWS, R., BENNET, J.P., AND HSIBAE-LI : **Human amnion as an adjunct in wound healing.** LANCET. 1980. : 1156-1158.
6. PIGEON, J. : **Treatment of second degree burns with amniotic membranes.** CHANDIAN MEDICAL ASSOCIATION JOURNAL. 1960. 83 : 844.
7. QUINBY, W.C. Jr., AND HOOVER, H.C. : **Clinical trials of amniotic membranes in burn wound care.** AMERICAN BURN ASSOCIATION, 1978.
8. ROBSON, M.C., SAMBORG, J.L., AND KRIZEK, T.J. : **Quantitative comparison of biologic dressings.** Surgical FORUM. 1972; 23 : 503.
9. ROBSON, M.C. AND KRIZEK, T.J. : **The effect of human amniotic membrane on the bacterial population of infected rat burns.** ANNALS OF SURGERY. 1973, 197 : 144.
10. ROBSON, M.C. AND KRIZEK, T.J. : **Amniotic membranes as temporary wound dressings.** SURGERY GYNECOLOGY OBSTETRICS. 1973, 136 : 904.
11. SABELLA, N. : **Use of fetal membranes in skin grafting.** MEDICAL RECORDS OF NEW YORK. 1913, 83 : 478-80.
12. WALKER, A.B., COONEY, D.R., AND ALLEN, J.E. : **Use of fresh amnion as a burn dressing.** JOURNAL OF PAEDIATRIC SURGERY. 1977, 12 : 391.