DRUSTS ASSOCIATES
LANGUAGE SERVICES
P. O. Box 548, Medford, NJ 08055
Phone (609) 596-8261 • Fax (609) 985-9233

DECLARATION OF ACCURACY AND PRECISION

Re: Translation from Portuguese

Article by De Paola et al., "Cellulose membrane - New biological dressing for improving the receptor bed for skin grafting"

This declaration certifies the accuracy and precision of the translation from Portuguese into English of the above material and is an accurate reflection of the text as it appeared in Portuguese.

For the translator:

Translator

11/1/96
Date

Revista Brasileira de Cirurgia 77(3): 135-138, 1987

CELLULOSE MEMBRANE - NEW BIOLOGICAL DRESSING FOR IMPROVING THE RECEPTOR BED FOR SKIN GRAFTING

by

D. Quintella De Paola* and M. G. P. Pires de Souza**

SUMMARY

It is presented a case of giant and infected basal cell carcinoma from esternal region submitted to surgical resection and receiving "Biofill" (cellulose graft) before skin grafting. It is proposed the use of "Biofill" after infected tumour removal when local conditions are not adequate to desirable reconstruction.

KEY - WORDS: giant basal cell carcinoma; skin substitute

For some years now, investigations have been being developed in the direction of achieving a suitable substitute for skin,[1-4] of both animal origin, such as pig skin,[5] human amniotic membrane,[6] and collagen,[7,8] and on the basis of synthetic substances such as silicone,[9] polyurethane[10] and "hidron."[11]

Studies have been carried out recently with the use of a new material, called "Biofill"*** (Fig. 1) as coverings for superficial skin lesions ensuing from burns, graft-donor areas, and dermabrasion.

Study conducted at the Senior Author's private clinic.

*Chief of Plastic Surgery Section of the State Hospital of Curupaiti - RJ [Rio de Janeiro state]. Physician in the Plastic Surgery Section of the Hospital dos Servidores do Estado - RJ.

**Postgraduate Student on the Plastic Surgery Service of the Antonio Pedro University Hospital, Federal University of State of Rio de Janeiro.

***"*BIOFILL,*" *Industria e Comércio de Produtos Biotecnológicos - Paraná/Brasil.*

Our proposal in this study is to demonstrate another use for "Biofill," namely, as a biological dressing for deep wounds, for improving local conditions until definitive treatment becomes possible.

Case report

Patient 58 years of age, white, male, exhibiting vegetating tumor formation 12 cm in diameter, progressing for one year, in the sternal region (Fig.s 2A and 2B). The lesion, with areas of necrosis, bleeding, and a large amount of purulent secretion--even giving off a foul order at a distance--was biopsied and proved to be a matter of a cystoid basal cell carcinoma.

Under local anesthesia (1% xylocaine with epinephrine 1:200000), exeresis of the lesion was performed, with a 10-mm^3 safety margin, with careful hemostasis and protection of the site with moist compresses and physiologic salt solution. The "Biofill" membrane was then removed from the packaging and recut in accordance with the resulting lesion, so as to leave a surplus of approximately 1 cm outside the edges. We then proceeded to hydration of the membrane in physiological salt solution and applied it over the receptor bed. With the exertion of a little pressure upon it with dry gauze compresses, a perfect fit is achieved, with elimination of the excess serosanguineous secretion and air bubbles between the membrane and the bed (Figs. 3A and 3B). When the dry gauze dressing was removed, after 24 hours, the membrane was found to be dehydrated and adhering well to the bed (Fig. 4). The patient did not report pain on palpation or any discomfort from the presence of the membrane. There was no secretion, edema, or local hyperemia. The shower-bath was turned on and the membrane was left exposed to the air, without any additional protection. On the 3rd day, small amount of yellowish secretion began to appear in the lower pole. Our management was conservative, with only compression of the

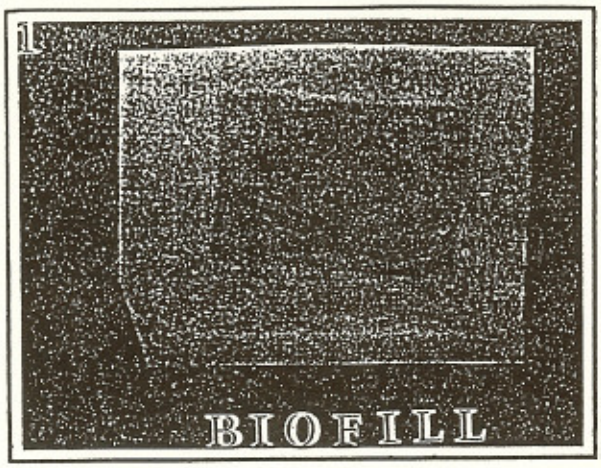

Fig. 1 - Package containing "Biofill" cellulose membrane.

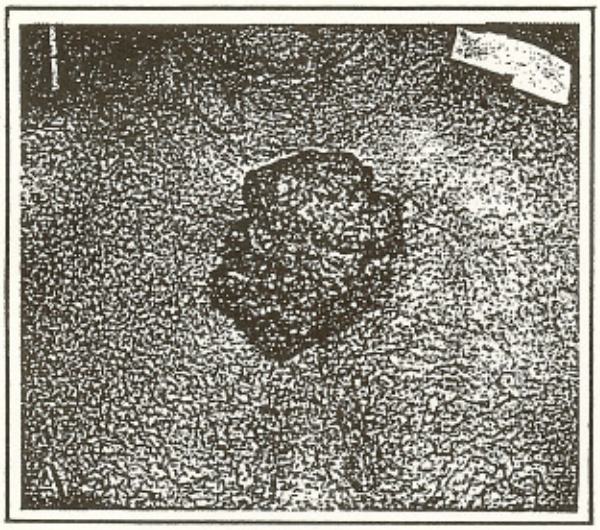

Fig. 2A - Preoperative appearance of basal cell carcinoma

membrane to get rid of the greatest possible amount of the secretion. We kept the "Biofill" exposed. This secretion persisted and on the 14th day we removed the membrane and washed the area with physiological salt solution and neutral soap and put on a new "Biofill" (Fig. 5). On the 20th day, we then proceeded to take off the membrane and again washed the bloody area--which was now seen to be 7 cm in diameter and had granulation tissue level with the surgical edges--with physiological salt solution and neutral soap. We revived this granulation tissue and medium

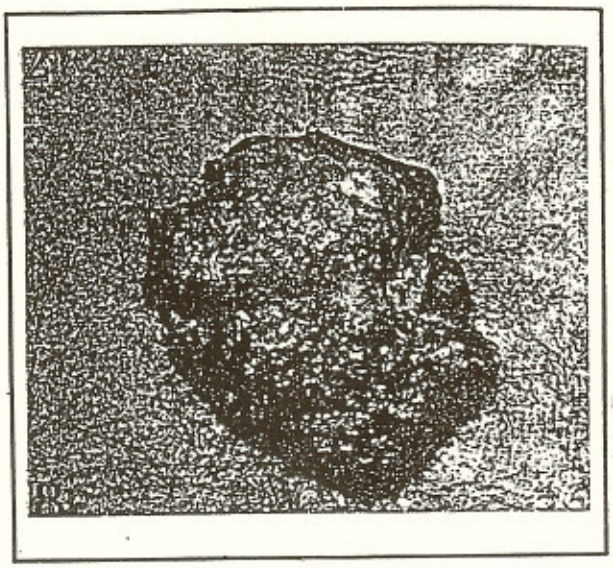

Fig. 2B - Detail of tumor with areas of necrosis, infection, and bleeding.

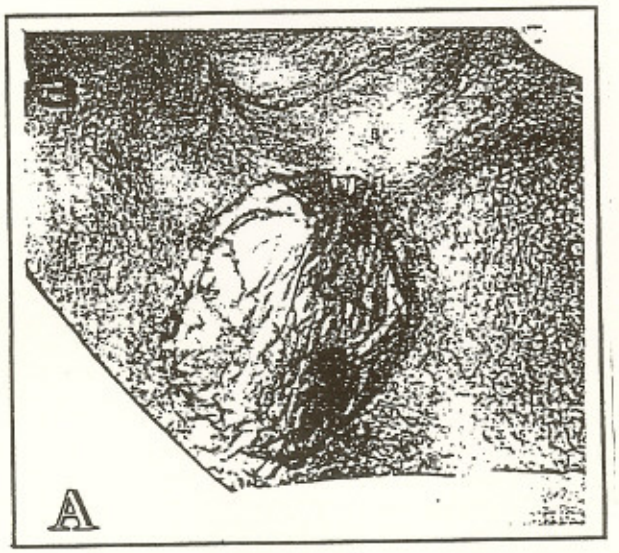

Fig. 3A - Immediate postoperative appearance, after placement of the "Biofill."

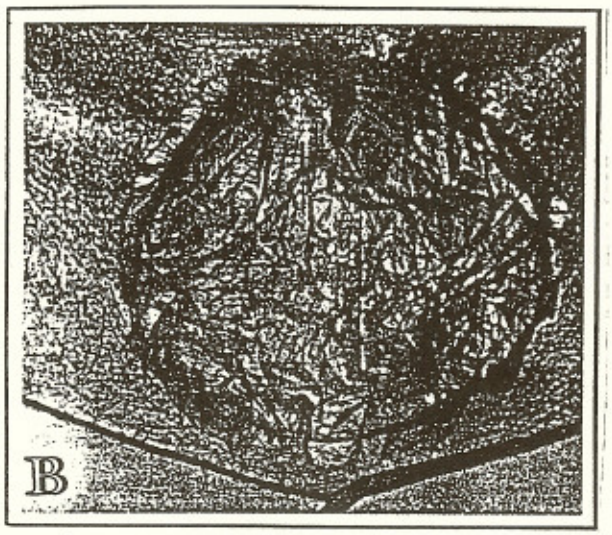

Fig. 3B - Detail of membrane with perfect fit in the bed and 1-cm surplus outside the edges.

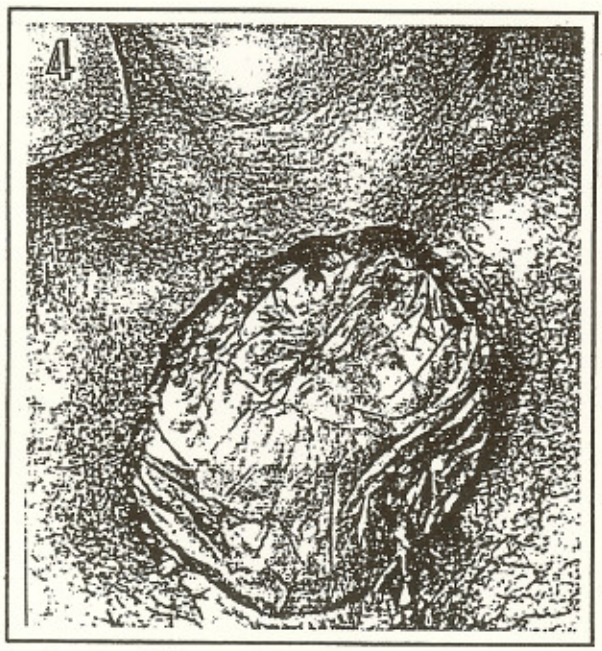

Fig. 4 - Postoperative appearance at 24 hours. Membrane adhering completely to the bed with formation of scabs on the edges.

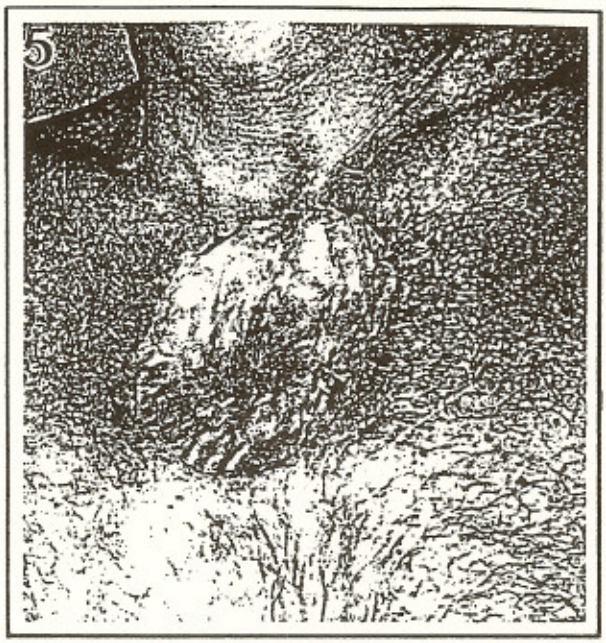

Fig. 5 - New "Biofill" put in place on the 14th postoperative day.

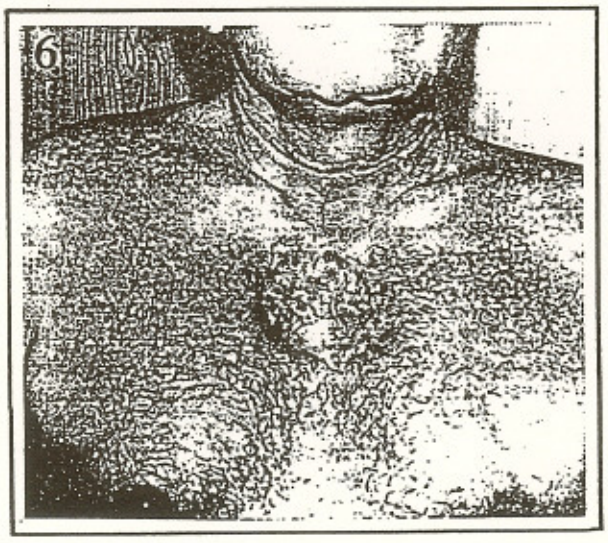

Fig. 6A - Postoperative appearance 15 days after skin grafting.

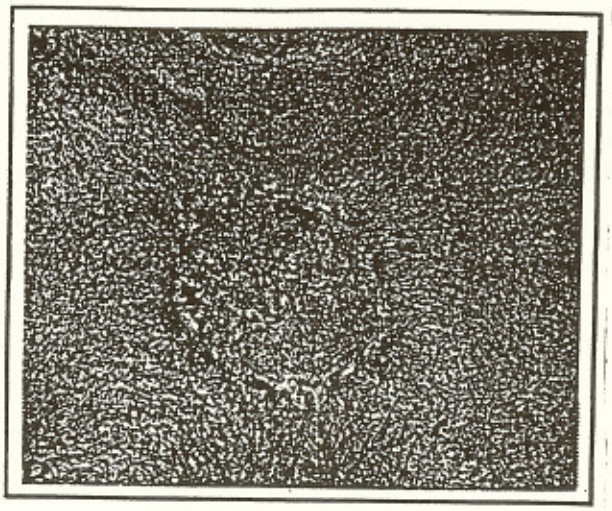

Fig. 6B - Detail of completely integrated graft 7 cm in diameter and without depression.

thick skin graft. After five days, we removed the Brown's dressing[12] and went on to use dressings with sodium fusidate. Within five days, the dressing was removed and the patient resumed his normal activities (Figs. 6A and 6B).

RESULTS

It is important to emphasize the significant decrease in the diameter of the bloody area from 12 cm to 7 cm and the levelling off of the base of the lesion, by 20 days' use of "Biofill." We achieved, with the use of the cellulose membrane, improvement of the local conditions for definitive treatment, in the case of the skin grafting, a reduction of the bloody area, and complete comfort for the patient, who, 24 hours after the application of the "Biofill," went back to leading a normal life. The small amount of secretion encountered in no way interfered with the good course of the treatment, as it did not prevent exposure of the membrane or restrict the patient's activities.

COMMENTS AND CONCLUSIONS

Having come face to face with a patient with an infected giant basal cell carcinoma in the sternal region, our initial surgical indication was exeresis of the lesion and skin grafting.[13] However, owing to the local infection, the possibility of the graft "taking" would be very remote,[14] which led us to opt for surgery in two stages. We then decided to utilize the same material ("Biofill") with which we are conducting a study in chronic ulcers of the lower limbs, still under way, but already yielding quite encouraging results, in the Curupaiti (RJ) State Hospital.

The membrane in question, called "Biofill, Biological Fill-in," consists of a microfibrillar net of cellulose, an inert substance,[15] resulting from bacterial biosynthesis, Acetobacter genus. The resulting membrane--semitransparent, homogeneous, with definite permeability to liquids and gases and resistant to traction and elongation--is very similar to human skin.

Although the studies with "Biofill" are still in the experimental stage, as it was developed only three years ago by the independent researcher Luiz Fernando Xavier Farah, in Curitiba, Paraná, it can already be noted that it will be extensively used in the near future as a temporary substitute for lost skin. As it is a matter of a product of completely Brazilian technology, its production cost is low, without consideration of the fact that after 24 hours the patient does not need dressings, antibiotics, or other medications, nor is hospitalization required, which makes the treatment even more economical.

REFERENCES

1. Buldalian J. A comparative study of synthetic and biological materials for wound dressings. J Trauma 1973; 13: 32.
2. Maruvick C. Skin substitute may permit more "natural" burn healing (news). JAMA 1983; 18: 250(19): 2586.
3. Tavis MJ, Thornton JW, Harney JH et al. Mechanism of skin graft adherence collagen, elastin and fibrin interactions. Surg Forum 1977; 28: 522.
4. Tavis MJ, Thornton JW, Danet R, Barthett RH. Current status of skin substitute. Surg Clin North 1978; 58: 123.
5. McCabe W P, Rebuck J W, Kelly A P Jr., Ditmars S M Jr. Cellular immune response of humans to pig skin. Plast Reconstr Surg 1973; 51: 181.
6. Colocho G, Graham W P, Green A E et al. Human amniotic membrane as a physiologic wound dressing. Arch Surg 1974; 109: 370.
7. Ladany I J et al. Substitution of experimental skin defects with collagen foam. Acta Chir Acad Sci Hung 1974; 15(2): 181-188.
8. Tavis M J, Harney J H, Thornton J W et al. Modified collagen membrane as skin substitute: preliminary studies. J Biomed Mat Res 1975; 9: 285.
9. Kornberg J et al. Ultra thin silicone polymer membrane: a new synthetic skin substitute. A preliminary study. Am Soc Artif Intern Organs 1972; 18: 39-44.
10. Neal D E, Whalley P C, Flowers M W, Wilson D H. The effects of an adherent polyurethane film and conventional absorvent dressing in patients with small partial thickness burns. Br J Clin Pract 1981; 33(7-8): 254.
11. Sagi A et al. Dermodress: a new temporary skin substitute for extensive deep burn coverage. Plast Reconstr Surg 1985; 75(2): 223-226.
12. Brown J B, McDowell F. Skin grafting. 3rd Ed. Philadelphia: J. B. Lippincott Company, 1958.
13. Gibson E W. Some aspects of the management of recurrent basal cell carcinoma. In Wallace, A. B. (Ed), Transactions International Society of Plastic Surgeons, 2nd Congress, London, 1959. Baltimore: Williams & Wilkins, 1960: 110.
14. Converse J M. Reconstructive plastic surgery. Philadelphia: W. B. Saunders Co., 1964: 180.
15. O'Connor R. Instrumental analysis of cotton cellulose and modified cotton cellulose. New York: Marcel Oekker, Inc., 1972.