The Healing Power of Nature

Observations on the use of Fish Skin Graft* (FSG) for the rapid coverage of exposed bone with granulation tissue in Mohs Micrographic Surgical Wounds of the Scalp

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INTRODUCTION

Large and deep non-melanoma skin cancers treated with Mohs Micrographic Surgery (MMS) can result in exposure of bone especially on the skin of the scalp. These large areas of bone exposure can be a difficult management problem as there may be insufficient laxity to repair the wound with a primary closure or flap. Skin grafts may also not be practical because avascular nature of the outer table of the bony calvarium often cannot support the nutritional needs of a graft. Complications associated with such wounds can include failed reconstructive surgical procedures (grafts and flaps), infection, slow healing and progression of an acute post-surgical wound to a chronic non-healing wound. Fish Skin Grafts have shown effectiveness in rapid coverage of exposed bone in Mohs surgical wounds of the scalp which can expedite second-intention healing or facilitate a delayed skin graft once the bone is covered with granulation tissue.

METHODS

A sixty-five-year-old female on an immunosuppressive medical regimen for renal transplantation presented with a large untreated Squamous Cell Carcinoma (SCC) of the central top of scalp measuring 5.1 x 3.5 cm. The SCC was cleared by Mohs Surgery in 2 stages resulting in a wide wound measuring 8.3 x 5.7 cm that extended down to the bony calvarium. The wound was partially closed but a wound measuring 3.0 x 3.5 cm remained with exposed bone at the wound base. The patient then underwent four (4) applications of FSG with debridement before each.

FISH SKIN GRAFT APPLICATIONS

A total of four fish skin (FSG) were performed before complete coverage of the bony calvarium was achieved. The wound progressed uneventfully with full closure with no complications.

*Kerecis™, Kerecis, Isafjordur, Iceland

CASE: 65-YEAR-OLD FEMALE SQUAMOUS CELL CARCINOMA (SCC)

Patient History: 65-year-old female on an immunosuppressive medical regimen for renal transplantation

Wound History: Patient presented with a 5.1cm x 3.5cm squamous cell carcinoma of the central top of scalp. Mohs Micrographic Surgery was performed and cleared the SCC. The wound extended to the level of the periosteum posteriorly but anteriorly a large portion of the bony calvarium was exposed. Reconstructive options were limited.

Fish Skin Graft Applications: 4 Applications of intact fish skin graft with serial debridements were performed. This resulted in rapid formation of granulation tissue which covered the bone. The wound progressed to complete closure and contracted to pulll hair bearing skin and minimize alopecia.

Patient Outcomes:

8.3 x 5.7cm wound to the level of the bone (calvarium) following Mohs surgical excision of a squamous cell carcinoma (SCC)

First application of fish skin graft (FSG) solid over the bone following partial closure of the posterior aspect of the wound

Second application of fragmented fish skin graft (FSG)

Complete coverage of calvarium with robust granulation tissue

Continued healing of the wound

Final appearance of healed wound measuring 2.5 x 3.2 cm following 4 applications of fish skin graft (FSG)

RESULTS

There was complete coverage of the 3.0 x 3.5 cm area of exposed calvarium with healthy granulation tissue with 4 applications of FSG. There was no infection or surrounding inflammation of the wound. Once granulation had been achieved the wound could have been grafted but the choice was made to allow the wound to continue to heal by second intention to allow wound contracture to minimize alopecia at the site of the scar. The final scar healed nicely with excellent contour and measured 2.5 x 3.2 cm. The amount of alopecia of the final wound was minimal due to contraction.

DISCUSSION

FSG is a biologic that has been proven to promote rapid granulation tissue formation in wounds. It has proven to be very effective in rapid coverage of wounds of the scalp with calvarium bone exposure that would be difficult to manage otherwise. Use of FSG is safe and effective in management of difficult scalp wounds and its use may expedite healing and reduce complications in these challenging cases.

References

1. Aldabagh, B., & Cook, J. L. (2014). Reconstruction of Scalp Wounds with Exposed Calvarium Using a Local Flap and a Split - Thickness Skin Graft: Case Series of 20 Patients. Dermatologic Surgery, 40(3), 257-265.
2. Kirsner, R. S., Margolis, D. J., Baldursson, B. T., Petursdottir, K., Davidsson, O. B., Weir, D., & Lantis, J. C. (2020). Fish skin grafts compared to human amnion/chorion membrane allografts: a double - blind, prospective, randomized clinical trial of acute wound healing. Wound Repair and Regeneration, 28(1), 75-80.