

Utility of a Synthetic Hybrid-Scale Fiber Matrix* in Irradiated Post-Mastectomy Wounds

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Introduction

Locally advanced breast cancer can be surgically treated via mastectomy, a procedure which removes all breast tissue from the breast.¹⁻² This approach is often utilized in conjunction with adjuvant or neo-adjuvant treatment, which may include chemotherapy, radiation therapy, or both.¹ Studies have shown that post-mastectomy wound complications occur frequently, in as high as 37% of the population.³ Radiation and chemotherapy have a negative effect on wound healing, making treatment of these wounds challenging.¹ A synthetic hybrid-scale fiber matrix could provide a novel treatment option for management of irradiated post-mastectomy wounds by providing a scaffold for cellular infiltration, differentiation, and neo-vascularization.⁴

Methods

A retrospective review of two patients with post-mastectomy wounds treated with a synthetic hybrid-scale fiber matrix was conducted via a review of patient charts. Both patients were on active chemotherapy at the time of treatment with the synthetic matrix. The synthetic hybrid-scale fiber matrix was applied in full contact with the wound bed. The matrix was then covered with a non-adherent dressing in conjunction with petrolatum ointment to maintain moisture. Each patient returned to the wound clinic for follow-up and re-application of the matrix as clinically indicated.

Results

Patient #1

67 y/o female on active chemotherapy. Wound developed post-mastectomy in a previously irradiated area and complicated by cellulitis infection. The wound had been open for 34 weeks at initiation of treatment. After 5 applications over 17 weeks, new granulation tissue developed over the exposed rib and the patient was able to return to work as a nurse.



Patient #2

56 y/o female with diabetes mellitus on active chemotherapy. Developed a left breast abscess and subsequent wound with exposed rib following radiation therapy. The wound previously failed xenograft therapy. initiation of treatment. The patient received 2 applications and achieved complete closure in 10 weeks.



Discussion

A synthetic hybrid-scale fiber matrix was used to successfully manage two post-mastectomy wounds. One wound achieved complete closure and bone coverage in under 6 weeks. The second wound developed significant coverage, allowing the patient to return to daily activities. The synthetic hybrid-scale fiber matrix mimics native human extracellular matrix in both size and structure.⁴ Via topographical cues, it encourages cellular infiltration and upregulation of collagen formation.⁵ The synthetic nature of matrix limits inflammatory response and premature enzymatic degradation, allowing for regranulation and re-epithelialization to occur.⁵ The synthetic hybrid-scale fiber matrix may show promise in the management of complex post-mastectomy wounds.

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