

Mary E. Hanley, DO, FUHM, CWSP, FAPWCA

Roper St. Francis Healthcare Wound Care, Vascular Medicine, Hyperbaric Medicine & Limb Preservation Program Medical Director,
Charleston, South Carolina USA

Introduction

A 65-year-old female with recurrent I Stage IIA (pTopN1a) left breast ductal carcinoma involving 3/9 left axillary lymph nodes Estrogen receptor-positive, HER2-neu IHC 2+, status post Left modified radical mastectomy presented to the Wound Care Center with dehiscence of the surgical wound approximately four weeks post-operatively.

Methods

The patient presented to the Wound Care Center weekly for serial debridement and evidence-based wound care, which consisted of cleaning the wound bed with Vasch™, meticulous wound bed preparation with sharp debridement to remove slough and devitalized tissue impeding healing, and use of Icelandic Cod fish skin graft once the wound bed was clean and vascular and appropriate for skin substitution. The patient received 30 hyperbaric oxygen treatments and was treated Monday through Friday at 2.4 atmospheres absolute with two ten-minute air airbrakes during a 90-minute session. She did not receive chemotherapy during her wound care treatment. She tolerated hyperbaric oxygen treatment very well with no apparent complications.

Results

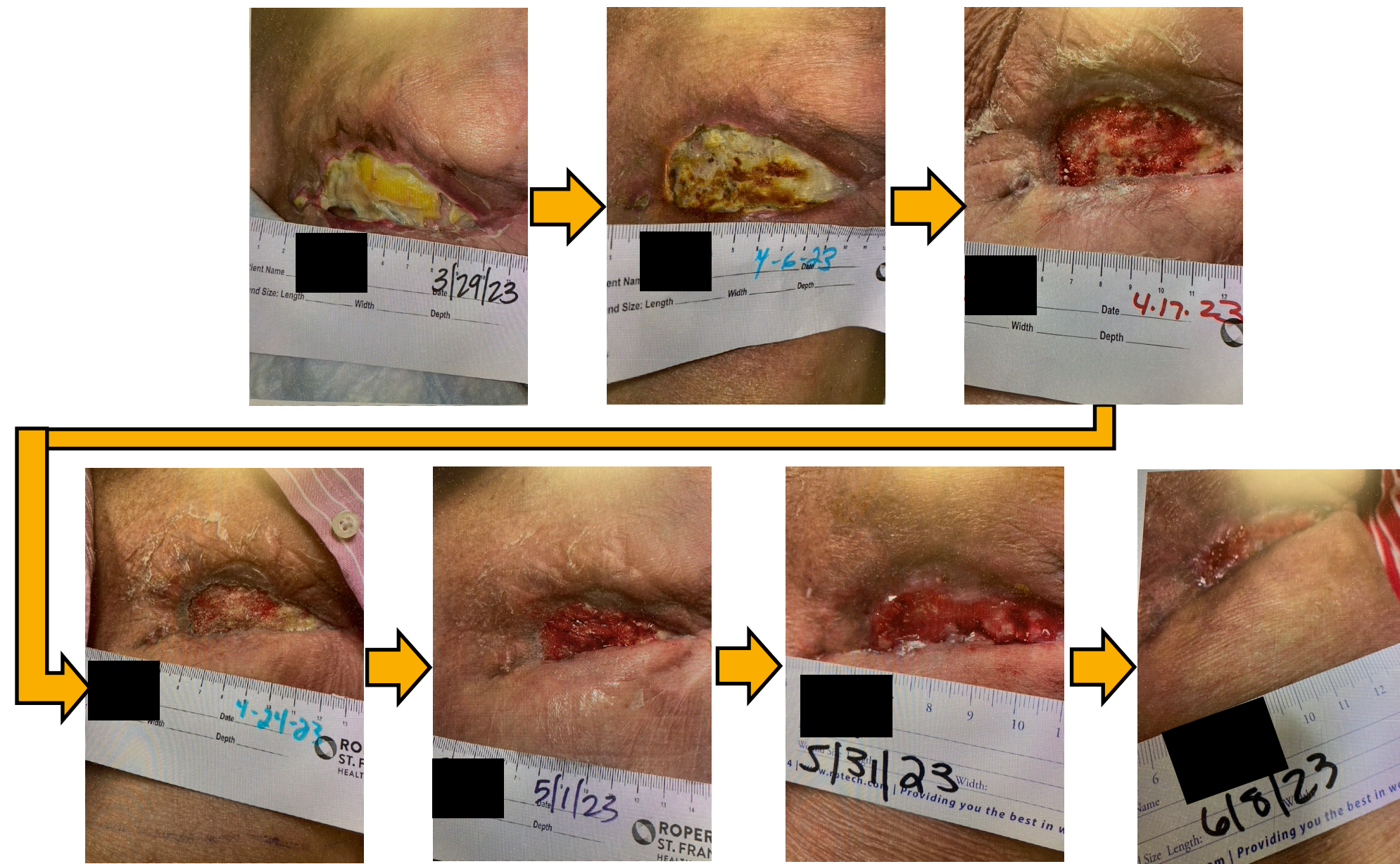


Figure 1: Progression of wound from presentation through healing.

The patient healed the wound entirely after approximately ten weeks of therapy. She received two applications of the Icelandic Cod Fish-skin graft approximately 30 days apart, along with adjunctive hyperbaric oxygen treatments which accelerated the granulation and epithelialization of this complex surgical wound.

Discussion

More than 600,000 patients in the United States receive radiation to treat malignancies, and over half of them go on to be long term survivors (Feldmeier 2019). Radiation complications such as soft tissue radionecrosis cause problems with wound healing and can drastically affect the quality of life for cancer survivors (Feldmeier 2019). Radiation injuries are classified as Acute, Subacute, and delayed complications. Delayed complications occur six months to 20 or 30 years after the radiation treatments are completed and are often precipitated by trauma such as surgery in the previously irradiated field. The most common finding in irradiated tissue is obliterative endarteritis. The tissue becomes chronically indurated, hypovascular, and chronically hypoxic due to the loss of small blood vessels. Hyperbaric oxygen therapy has been shown to promote angiogenesis or growth of small vessels into the radiation-damaged tissue (O'Sullivan 2003). Hyperbaric oxygen increases the blood flow to hypoxic tissue and promotes healing. Hyperbaric oxygen has also been shown to decrease fibrosis and mobilize the release of stem cells within irradiated tissues (Marx 1983).

The patient's wound bed was meticulously debrided, and biofilm controlled before using Icelandic Cod Fish Skin for wound healing x 2 applications. The skin substitute, hyperbaric oxygen, and evidence-based wound care combined to allow this patient to heal this highly complex wound. Skin substitutes are an excellent healing addition to the Wound Care Specialist armamentarium. However, they must be used ethically and appropriately on the right wound bed, on the right patient, at the right time. It is vital to meticulously prepare the wound bed with serial debridement, and reduction or eradication of biofilm. In our experience, using a skin substitute such as Icelandic Cod Skin on previously irradiated wounds concurrently with hyperbaric oxygen therapy to improve microvascular circulation and increase angiogenesis to the wound bed vastly improves healing and outcomes for these patients.

References

