Innovations in Wound Healing Therapy

"Where Wounds Go To Heal"SM

Chest Wall Radiation Injury

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Abstract

A number of successfully treated breast cancer patients suffer from painful chronic ulcers of their chest wall which are difficult to care for and challenging to heal as a result of adjuvant radiation therapy. The following case will demonstrate how advanced wound care treatments and Hyperbaric Oxygen Therapy can improve the success rate in healing these complicated problems.

Radiation therapy is an effective modality in treating breast cancer, but is associated with a significant risk of chronic ulceration and non-healing of the involved chest wall. Radiation therapy injures rapidly growing cells, such as cancer cells, but can also injure normal tissue in the radiated field. Especially vulnerable are the endothelial cells, leading to arteritis and ischemic fibrosis. The resulting hypoxia can lead to chronic chest wall ulceration in the treated breast cancer patient. Plastic surgical repair of these radiation tissue injuries has a significant failure rate due to the hypoxic state caused by the reduced blood supply. Hyperbaric Oxygen Therapy can stimulate angiogenesis in the radiated tissue field, reversing the hypoxia and potentially improving the success rate of these plastic surgical repairs.

History & Physical Exam

This is an 84 year old female who underwent a mastectomy 37 years previously for breast cancer. She later developed multiple local skin recurrences, which were treated with surgical excision and radiation therapy to the involved chest wall. She subsequently developed a non-healing ulcer, which failed to close despite various forms of local wound care including negative pressure therapy.

She presented to our clinic in relatively good health. The only pertinent finding was a tender ulcer on the left lateral chest wall, which was found to be free of cancer by recent surgical excision. The ulcer base was a mix of granulation, slough and necrotic tissue with a rib palpable at the center of the ulcer. There was a large amount of foul smelling purulent drainage and the peri-ulcer skin demonstrated the fibrotic skin changes typical of radiation injury.

Before Treatment

Studies

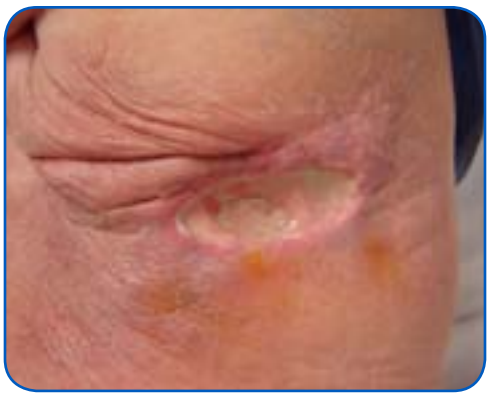
Workup included a culture which was positive for Beta Hemolytic Streptococcus. X-rays of the ribs and CT scan were negative for bony destruction or recurrence of the cancer. Transcutaneous Oximetry revealed localized areas of hypoxia involving the radiated peri-ulcer skin.

Treatment

The previously used negative pressure therapy was discontinued due to the inability to maintain a seal, which lead to a build up of purulent drainage. Our initial wound care focused on controlling the drainage and high bacterial count utilizing Cadexomer Iodine. Hyperbaric Oxygen Therapy was started. In chamber Transcutaneous Oximetry showed a marked increase in the pO2 of the radiation injured peri-ulcer skin. As the ulcer cleaned up, we were able to reduce the frequency of the dressing changes utilizing an absorbent silver dressing.

During the course of Hyperbaric Oxygen Therapy, the ulcer began to decrease in size and the fibrotic skin became softer and less painful. Follow up Transcutaneous Oximetry demonstrated normal pO2's of the peri-ulcer skin, confirming that the radiated skin was developing a new blood supply.

During Treatment



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Gradually the ulcer decreased in size with the growth of new granulation tissue and the quality of the skin improved. The patient was referred to plastic surgery for excision of the ulcer with a rotational flap to close the site more quickly. The procedure was uneventful.

Surgery

After Treatment

Conclusion

A number of successfully treated breast cancer patients, who have been treated with radiation therapy suffer with chronic ulcers and non-healing wounds. Hyperbaric Oxygen Therapy may be useful in improving the success of plastic surgical repair.

About Precision Health Care

Precision Health Care is a comprehensive wound healing and hyperbaric medicine service organization dedicated to the development of state-of-the-art hyperbaric and wound healing centers through partnership and collaboration with our affiliate hospitals.

Community-based and patient-focused, we are driven by this mission philosophy: To provide select hospitals the safest, most-comprehensive and compassionate wound healing services.

Questions or Comments?

Contact us:
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About the Author

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THE PRIMARY CARE PHYSICIAN SHOULD REFER THE PATIENT FOR ADVANCED WOUND CARE IN A WOUND HEALING CENTER IF THE PATIENT:

- Has a wound that persists for more than 30 days after treatment
- Has a wound and Reynaud's phenomenon
- Has purpura
- Has a wound and hypertension
- Has gangrene or necrotic tissue in a wound
- Has a wound and diabetes

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