Cutaneous ulceration and breast implant compromise after pulse dye laser for radiation-induced telangiectasias

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INTRODUCTION

Breast cancer is the most common noncutaneous malignancy occurring in women and as such patients are experiencing the sequelae of treatments. Radiation therapy is used in the adjuvant setting for locally advanced breast carcinoma or in patients after total mastectomy.

Radiation dermatitis, both acute and chronic, can complicate radiation therapy.[1] Chronic radiation dermatitis presents as isolated or diffuse telangiectasias over the radiated field and may be physically disfiguring and psychologically distressing for patients. These patients may present to dermatologists for treatment with laser and light-based devices. Previously radiated skin has the potential for cutaneous compromise. We report a case of cutaneous ulceration after pulsed dye laser treatment and the potential complications of treating radiated tissue. We also discuss methods for safe treatment of these patients.

CASE REPORT

A woman in her 40s, Fitzpatrick skin type II, with a history of breast cancer, but otherwise healthy, presented to the dermatology service for treatment of chronic radiation-induced breast telangiectasias of the right breast. Her previous breast cancer treatment consisted of bilateral mastectomy with adjuvant radiation to the right chest followed by tamoxifen and anastrozole. She had surgical reconstruction of the right breast with breast tissue expanders and a silicone breast implant, which was complicated by seromas.

The patient's physical examination was remarkable for a reconstructed right breast with matted telangiectasias predominantly of the right medial breast extending to the right inframammary fold.

The patient had undergone 1 treatment with the 595-nm pulsed dye laser Perfecta (Syneron; Candela, MA), 10 mm spot size, 7 J/cm^2 fluence, and 3 ms pulse duration to the upper breast, décolletage, and inframammary fold; 1 pass was performed without pulse stacking to the aforementioned areas without complication. She had expected posttreatment purpura that resolved and subsequent clearing of some telangiectasias. The patient presented 4 weeks later for a second treatment with the same laser parameters used during the first treatment. There was transient graying of the telangiectasias and resultant purpura as expected. She presented 3 weeks later with 2 areas of dry heme crust in the medial right inframammary fold without ulceration. She denied any trauma to the area in the interim. There were no signs of skin infection. She was instructed to use mupirocin ointment twice daily. More aggressive wound care (eg, debridement) was not recommended given the clinical appearance and history of radiation. One month later, she presented with a 1-day history of serous drainage from the site. Wound culture found only skin flora. A week later, she informed the office of increasing serous drainage from the area. The patient presented to the plastic surgeon; the breast implant was exposed through 3 small areas of skin ulceration at the previous sites of crusting that necessitated immediate implant removal.

DISCUSSION

Laser treatment of vascular lesions is well established. The pulsed dye laser with wavelengths of 585

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to 595 nm has been used extensively with a very low incidence of reported adverse effects.[2] However, we present a case of ulceration and subsequent breast implant compromise after pulsed dye laser treatment.

This case highlights important considerations when treating radiated skin, specifically the breast. Radiation can induce fibrosis and atrophy of the treated area, which can cause the skin to appear scarlike clinically and histologically. The loss of adnexal structures and fibrosis in irradiated skin may predispose the skin to impaired wound healing and tissue breakdown.[3]

Typically, whole-breast radiation therapy with boost to the skin is performed for breast cancer treatment (as in this case), but accelerated partial breast irradiation with intensity-modulated radiation therapy may also be used. Both can be done in a standard or hypofractionated dosing schema and while the patient is supine or prone. During breast reconstruction, when an implant is used, the pectoralis muscle covers the implant in the superior chest/breast area. The lower chest/breast area may have no muscle coverage over the implant; thus, skin breakdown in this area may compromise an underlying breast implant. In addition, the inframammary fold may be an area predisposed to a higher radiation dosage, depending on the alignment of the tissue during radiation treatments.[4] Our patient experienced a nonhealing ulceration that led to subcutaneous tissue and implant exposure, resulting in a procedure to remove the implant and subsequent reconstruction.

We report this case to document a previously unreported, adverse event and to highlight important considerations before laser treatment. Treatment is best focused to cosmetically sensitive areas such as the upper chest and not in areas that received the highest radiation dosage. It is also prudent to avoid areas in which the thinnest tissue coverage lies and to use conservative laser settings. Before commencing treatment, we recommend counseling the patient on all possible adverse events and speaking with their reconstructive surgeon and radiation oncologist to obtain pertinent clinical history that may portend a higher risk of skin breakdown.

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