Management of Radiation Dermatitis in a Patient After Mastectomy

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Commentary by Mary Arnold Long

Women who are diagnosed with breast cancer and undergoing chemotherapy and radiation are at high risk of developing acute radiation dermatitis. The purpose of this case study is to explore an alternative topical therapy for skin toxicity in the post-radiation care of a patient with a history of breast cancer. The patient, a 54-year-old white female, was treated by modified radical mastectomy, chemotherapy, and radiation. During post-radiation therapy the patient developed desquamation reaction over the midincision line into the right axilla. Balsam Peru, hydrogenated castor oil, trypsin (Xenaderm Healthpoint, San Antonio, Tex) was trialed to evaluate efficacy in providing wound healing to the denuded skin. Within 14 days of treatment, the area was completely healed and topical therapy stopped. This case study provides the basis for further research into the area of topical therapy for women with moist desquamation after radiation for breast cancer.

Women who are diagnosed with breast cancer and undergoing chemotherapy and radiation treatment are at high risk of developing acute radiation dermatitis. Estimates of the number of women who suffer some degree of acute radiation dermatitis are as high as 87-95%. Many staging systems describe the severity of skin damage and all include a description of degree of erythema, dry desquamation, and moist desquamation. The degree of skin damage is related to several variables, including dose and quality (type and energy) of radiation, time period during which the radiation is given, and size of field (volume). Porock offers predictive factors for women with breast cancer for developing a severe skin reaction by the end of radiation treatment. These include age, smoking, weight and/or breast size, history of skin cancer, preexisting poor lymphatic drainage, general health, nutrition status, and preexisting chronic illness. Individual differences, such as radiosensitivity of the skin, prior ultraviolet exposure, sex, and genetic construct, affect how an individual will react to radiation therapy.

The purpose of this case study is to explore an alternative topical therapy for skin toxicity in the post-radiation care of a patient with a history of breast cancer. The treatment described in this case study may offer WOC nurses an alternate therapy for a common post-radiation skin ailment.

Case History

The patient is a 54-year-old white female with Stage III breast cancer of the right breast. Her medical history is noncontributory. The patient opted for traditional medical and surgical management of breast cancer and had a modified radical mastectomy in February 2003. Her postsurgical course was unremarkable, and the surgical wound healed without incident. In April 2003, she began the first 12-week course of chemotherapies, including adriamycin/cytokinin, and then began weekly injections of paclitaxel (Taxol, Bristol-Meyers Squibb Co, NY) for a total of 12 weeks. Chemotherapy was followed by radiation therapy for a total of 30 treatments (25 low-dose and then 5 super-boost treatments to the healed incision line).

The patient followed the radiation oncologist's protocol for skin care during radiation therapy and maintained a detailed diary of her experiences. The treatment plan included using a topical aqueous hydrogel (Radiagel, Carryington Laboratories, Irving, Tex) applied to the radiated area up to 3 times a day for the first 5 therapies.

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patient stopped this treatment because of local skin irritation characterized by "soreness" but denied erythema. Then she was switched to a topical oat beta glucan product, an oil-and-water emulsion product, which is indicated for dry skin and burns. (Glucan Pro, Brennan Medical, St. Paul, Minn). The patient developed some erythema and increased irritation but continued with this product for the remaining 20 therapies. She sought WOCN assistance when the skin toxicity continued to worsen, despite completion of radiation therapy. A localized wet desquamation reaction appeared over the midincision line and into the right axilla.

A topical product containing balsam peru, castor oil, and trypsin (BCT) used for the treatment of partial-thickness wounds (Xenaderm HealthPoint, Fort Worth, Tex) was trialed to evaluate efficacy in providing a healing wound environment to the denuded skin. The product is purported to stimulate blood flow at the capillary bed and maintain a moist wound bed to maximize healing. Therapy was continued with this ointment because immediate positive effects were noted. It was applied twice a day after cleansing with normal saline (Figure 1). Within 7 days, the patient's skin was no longer weeping and the patient reported less irritation and drainage. A tertiary advantage was that her clothes no longer "stuck." The patient did not experience any burning sensation, as may occur per product guidelines. Pain gradually decreased in the axilla region with continued application. Within 14 days, the patient was completely healed and stopped topical therapy. The patient continued to maintain skin suppleness with an over-the-counter topical lotion.

Discussion

A review of the literature indicates that numerous treatments are used to manage acute radiation dermatitis, some with better success than others. From the review, therapeutic treatment is addressed at 2 levels: prevention and management of side effects. Level of evidence is currently at level 3 based only on anecdotal and case study articles rather than randomized controlled trials.

Preventive therapies include, but are not limited to, the application of creams, lotions, and other topical treatments. Results vary, and the data are not supported by large repeated clinical trials. Several authors identify friction, such as skin shearing from clothing (bras or tight-fitting garments), and the fabric type of garment (such as synthetic fibers vs cotton and natural fibers) as factors that may interfere with normal skin processes.

If preventive measures fail, dry desquamation is the first sign of skin damage. Dry desquamation is defined as a skin area that is intact, dry, and characterized by flaking skin and pruritis and usually presents at 10-14 days after the first radiation treatment. Again, the literature recommendations for treatment of dry desquamation vary from numerous skin products, including over-the-counter lotions, creams, prescriptive agents, and topical corticosteroids. The choice of product used should be hydrophilic.
with neutral pH, because these products provide moisture to the injured area and decrease discomfort.\textsuperscript{3} By week 4 of radiation, moist dermatitis can develop, characterized by sloughing of the epidermis and exposure of the dermal layer.\textsuperscript{7} This dermatitis is typically found on the chest wall, supraclavicular region, or axilla or under the intact breast of the patient receiving breast radiation therapy. The goal of treatment is to minimize the trauma and discomfort, as well as promote healing and prevention of infection.\textsuperscript{8} Again, several products are used, including aloe vera, hydrophilic creams, antibiotics ointments, anti-inflammatory creams, silver sulphadiazine, and occlusive hydrocolloid and hydrogel dressings.\textsuperscript{24} Because the use of these products is not well supported by research data, effective treatment of moist desquamation requires additional information to establish treatment guidelines.

\section*{Summary}

This case study demonstrates the effectiveness of a topical ointment containing balsam peru, castor oil, and tynpsin for treatment of moist desquamation after radiation for breast cancer. In comparison to other products the patient tried, she had marked healing within 7 days with the use of the product. Because the product contains metal and can deflect radiation beams if used during therapy, application is indicated only after radiation therapies are completed or on discussion with the radiation oncologist. Because the literature lacks randomized controlled research practice guidelines for this patient population, many of the current best practices are based on case studies. To strengthen the scientific support for use of the product in other radiation skin toxicity applications, further evaluation via controlled research studies is warranted.

\section*{References}


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Radiation therapy has an incidence of 43 procedures per 1000 persons of all ages in the United States.\textsuperscript{1} Two national consensus conferences have determined that breast conservation using lumpectomy and radiation treatment is the preferred treatment in early-stage breast cancer.\textsuperscript{2} The author notes that the incidence of acute radiation dermatitis among women undergoing radiation treatment for breast cancer may be as high as 95%. Radiation dermatitis also can occur in those undergoing radiation treatment for other cancers.

Despite an exhaustive search for skin care guidelines during and after radiation therapy, standard guidelines do not exist. Multiple institutional Web sites were also searched. Two broad themes emerged. First, the skin should be cleansed with only mild soap and water during treatment. Second, the radiologist performing the radiation therapy would advise the patient on treatment of areas of irritation or blistering, should they develop. The potential for varied treatments with unclear outcomes exists because of lack of skin care guidelines during radiation therapy.

During treatment, the preferred skin care is mild soap and water. Based on our knowledge of the normal protective pH of the skin, a pH-balanced product is recommended, such as pHisoDerm (Chattem Inc, Chattanooga, Tenn), rather than alkaline commercial soaps. Although individuals may advocate emulsifying or protecting the skin with such agents as aloe or commercial emulsions (Biafine, Medix Pharmaceuticals Americas, Inc., Largo Fla), no benefit has been proven.\textsuperscript{24} It is also important to assess the patient for the use of any products that may increase the risk of radiation dermatitis during radiation therapy. Many medications and herbal supplements increase the risk of photosensitivity, so a thorough assessment of use of prescription and over-the-counter products, including herbal treatments, is necessary.\textsuperscript{3}

If radiation dermatitis occurs during treatment, the skin must be treated with hydrophilic agents so nothing interferes with the radiation beam. Hydrophilic agents include amorphous hydrogels, such as CarraSyn Hydrogel (Carrington Labs, Irving, Tex); emulsions, such as Biafine; or sheet hydrogels, such as Elasto-Gel (Southwest Technologies, Inc, N. Kansas City, Mo). One added benefit of the sheet hydrogel is that they may be removed, placed in the refrigerator, and reapplied. The coolness of the refrigerated hydrogel sheet may provide additional relief.

If radiation dermatitis extends beyond the time of radiation therapy, the need for hydrophilic agents no longer exists, although many practitioners continue the use of these.
products until epithelialization occurs. Use of Xenaderm Ointment is innovative because the product provides a barrier between the damaged skin and the external environment and promotes epithelialization. This product is approved for use on partial-thickness ulcerations. However, use of Xenaderm could not be considered during radiation therapy because it is hydrophobic. The manufacturers of Xenaderm recommend the product be used with or without a dressing. Depending on the severity and location of the radiation dermatitis, several dressing options could be considered. A dressing such as Mepitel Soft Silicone Wound Contact Layer (Molynlyke, Newtown, Pa) may be considered because it adheres to intact skin but not to open wounds. Mepitel may be removed to allow application of the Xenaderm and reapplied. Mepitel, however, is challenging to work with because of its adhesion to intact skin. This may make it difficult for the patient to apply and remove. Mepitel generally also requires a secondary dressing. Other nonadherent options include Telfa (Tyco Health Care/Kendall, Mansfield, Mass) or an emulsion-impregnated dressing, such as ADAPTIC Non-Adhering Dressing (Johnson & Johnson Medical, Somerville, NJ) or Mepilex Transfer or Mepilex Foam (Molynlyke). Telfa and Mepilex Foam do not require secondary dressings; however, ADAPTIC and Mepilex Transfer do. If the patient’s soft cotton brassiere without under wires or other garments secure dressings satisfactorily, the addition of tape is not necessary.

Cost may be a factor in the selection of interventions for radiation dermatitis during and after radiation therapy. Price for the aforementioned products were compared (Table 1) using the catalog of a mail-order supplier. The cost of Xenaderm to the pharmacy was derived by interview with a long-term acute care pharmacist. Because areas of radiation dermatitis are not routinely debrided, Medicare Part B would likely not cover the cost of the dressings. Other healthcare insurance providers may provide some coverage, particularly for the Xenaderm, because it is not available over the counter. Because the sheet hydrogels require less frequent application, they may be more cost-effective than the amorphous hydrogels, particularly because they do not require a secondary dressing. Although the Mepitel or Mepilex Transfer add expense to the use of the Xenaderm, it also may provide a cost benefit because it may be reapplied. Moreover, if epithelialization occurs in 2 weeks, as it did for the patient in the case study, product refills would be unnecessary.

Radiation therapy can affect the skin long after treatment. The patient may recover without difficulty from radiation dermatitis. Any skin exposed to radiation, however, is forever changed. The skin may darkened, and the patient may be at greater risk for impaired skin integrity compared to similar patients not exposed to radiation therapy. Should the patient experience a future wound in the irradiated area, that wound will be more difficult to heal. The patient should be counseled to share her history of radiation therapy with healthcare providers.

The use of Xenaderm to promote epithelialization is a novel and viable option for care, as demonstrated by this case study. As with all patient scenarios, however, appropriateness, ease, and cost of care must be evaluated on an individual basis.

**References**