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Paclitaxel-Induced Radiation Recall Dermatitis

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The authors present a case of radiation recall dermatitis occurring in a patient receiving paclitaxel shortly after completion of radiation therapy. A brief review of previously reported taxane-induced radiation recall reactions is provided. © 1996 Wiley-Liss, Inc.*

Key words: paclitaxel, docetaxel, taxane, radiation, dermatitis

INTRODUCTION

The development of inflammatory reactions in previously irradiated sites after chemotherapy has been classically reported with doxorubicin and dactinomycin [1,2]. Common sites involved by this reaction include skin and lung, although any tissue exposed to radiation may be susceptible to the recall reaction [3–5]. The mechanism of this radiation recall reaction is unknown. Recent reports describe a similar radiation recall phenomenon appearing after administration of a new class of anticancer drugs, the taxanes [6–10]. We report an additional case of radiation recall dermatitis occurring after paclitaxel administration, illustrating the relationship between paclitaxel and radiation therapy.

CASE HISTORY

A postmenopausal, 51-year-old Asian female underwent left modified radical mastectomy with axillary lymph node dissection in June 1993 for a 1.5 cm invasive lobular carcinoma. Estrogen and progesterone receptors were positive and no metastases were found in 28 axillary lymph nodes. She was placed on tamoxifen but developed recurrent disease localized to her left supraclavicular and cervical lymph nodes in May 1994. Brief treatment with megestrol acetate was unsuccessful and she began systemic chemotherapy with flourouracil, doxorubicin, and cyclophosphamide (FAC) in July 1994. An initial response was obtained followed by progressive disease after four cycles of FAC in the above-mentioned areas. She began radiation therapy in October 1994 and received 5,040 cGy in 28 fractions. A cobalt 60 radiation source was employed using parallel opposed anterior and posterior fields which encompassed the involved supraclavicular and cervical lymphadenopathy. Mild erythema of the skin along with resolution of the adenopathy was seen by the completion of treatment in December 1994.

One week after resolution of the radiation-induced skin erythema, the patient began high-dose chemotherapy followed by autologous bone marrow transplantation. Chemotherapy consisted of paclitaxel 340 mg (200 mg/m^2) by continuous infusion over 24 hours. Cyclophosphamide 3,188 mg (1,875 mg/m^2) and cisplatin 94 mg (55 mg/m^2) were administered daily for 3 days following completion of the paclitaxel infusion. Four days after paclitaxel administration, the patient developed painless, nonpruritic erythema followed by moist desquamation of the skin in the area of her radiation treatments (Fig. 1). Healing of the skin reaction occurred over the following 10 days without significant sequelae. No evidence of radiation recall pneumonitis was seen on chest roentgenograms obtained during this period.

DISCUSSION

The taxanes are an important new class of anticancer agents which are active against a broad range of tumor types and are approved in the United States for the palliative treatment of chemotherapy-resistant breast and ovarian carcinomas [11,12]. The taxanes exert their cytotoxic

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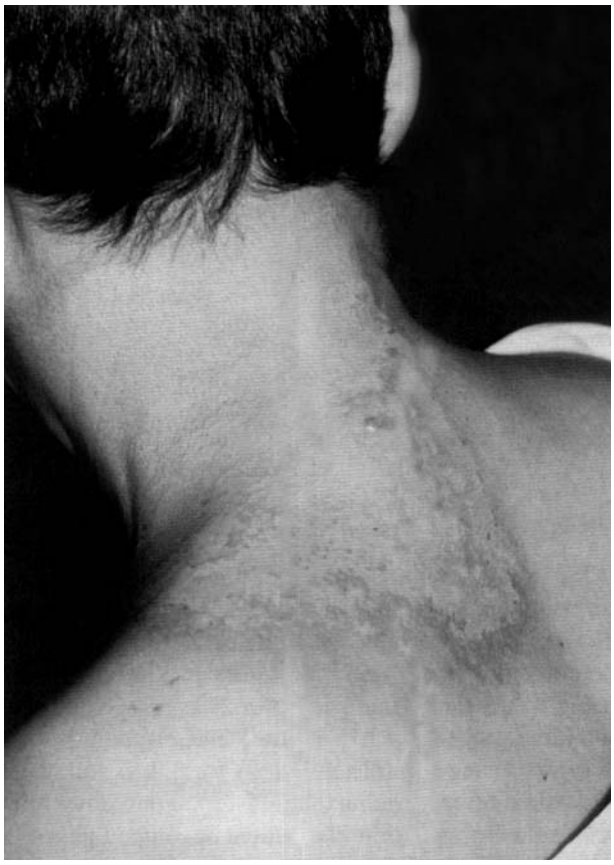

Fig. 1. An erythematous plaque with moist desquamation and altered pigmentation corresponds to the previously irradiated region.

effects via a unique mechanism involving the promotion of cellular microtubular polymerization. This polymerization results in mitotic inhibition of the G_2M stage of the cell cycle. Synchronization of cells in the G_2M stage of the cell cycle using paclitaxel has been shown to have a radiosensitizing effect, resulting in decreased cellular survival after radiation dosing to astrocytoma, melanoma, and ovarian cell lines [13,14]. It is not known how this potentiation of radiation effects correlates with the development of radiation recall dermatitis.

Radiation recall dermatis associated with taxane exposure has been described in five patients in the literature [6–10]. No threshold dose of radiation for this effect is apparent, with similar reactions occurring in patients receiving from 2,500 to 7,000 cGy. The contribution of other chemotherapeutic agents to the taxane recall reaction is a possibility, since cisplatin has been shown to have mild radiosensitizing properties [15]. Shenkier and Gelmon [8] report two patients treated with concomitant paclitaxel and cisplatin and suggest a synergistic effect between the drugs contributing to the recall reaction. Our patient also received cisplatin as part of her chemotherapy regimen, lending credence to that hypothesis.

We conclude that sufficient evidence exists to implicate the taxanes as etiologic agents in radiation recall reactions. Cisplatin may contribute to the reaction, as shown in our patient and in Shenkier and Gelmon's report. The most severe recall reactions appear to have occurred in patients receiving paclitaxel shortly after completing radiation therapy, and we would advise caution in the utilization of paclitaxel in that setting [6,10].

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