



# Lichenoid Dermatitis After Hypofractionated Radiation Therapy for Breast Cancer



Yukihiro Hama , Etsuko Tate

Department of Radiology, Tokyo-Edogawa Cancer Center, Edogawa Hospital, Tokyo, Japan.



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## ABSTRACT

Lichenoid dermatitis is a rare complication after radiation therapy and is often considered as a delayed hypersensitivity reaction. It is different from lichen planus and is characterized by fine white scale (Wickham’s striae). Here, we report a case of lichenoid dermatitis developed after hypofractionated whole-breast radiation therapy followed by breast-conserving surgery. A 60-year-old female patient underwent hypofractionated whole-breast radiation therapy followed by a boost to the tumor bed. Post-radiation course was uneventful, but violaceous, polyangular, and pruritic papules accompanied by the eruption were noted at the boost site. Clinical findings were consistent with lichenoid dermatitis, so steroid ointment and oral antihistamines were administered. Her lichenoid dermatitis was completely relieved in 2 weeks, and there was no sign of relapse during the 5 years follow-up. There are some reports of lichen planus induced after radiotherapy; however, this is the first report that shows lichenoid dermatitis as a possible complication after hypofractionated radiation therapy for breast cancer.

## Introduction



lichenoid dermatitis is a rare immunological and inflammatory disease and may be diagnosed with biopsy, or by clinical signs and symptoms [1-4]. Lichenoid dermatitis is sometimes treated as a delayed hypersensitivity

reaction since it occasionally develops in association with drug eruption, actinic keratosis, lupus erythematosus, acute graft versus host disease, and regressing neoplastic lesions [1-4]. Whole-breast radiation therapy is usually performed after breast-conserving surgery, and its effectiveness is considered equivalent between conventional fractionated radiation therapy and hypofractionated one [5-7]. Hypofractionated radiation therapy

\* Corresponding Author:

Yukihiro Hama, MD.

Address: Department of Radiology, Tokyo-Edogawa Cancer Center, Edogawa Hospital, Tokyo, Japan.

E-mail: [yjhama2005@yahoo.co.jp](mailto:yjhama2005@yahoo.co.jp)

is associated with less acute toxicity, but no difference in late cosmetic results [5-7]. Although acute radiation dermatitis usually improves within 1-2 months after irradiation, there is no report of lichenoid dermatitis after hypofractionated radiation therapy. Here, we report a case of lichenoid dermatitis after hypofractionated whole breast and boost irradiation following to breast-conserving surgery for localized breast cancer.

### Case Report

A 60-year-old postmenopausal female patient was referred to our hospital for adjuvant radiation therapy for node-positive right-sided luminal A-like breast cancer after breast-conserving surgery. On physical examination, no abnormalities were found in her surgical wounds, and no local inflammation or skin lesions were observed. Laboratory testing for hepatitis C virus infection was negative. Since the surgical margins were positive, the patient underwent whole-breast irradiation consisting of 39 Gy in 13 daily fractions followed by a 9 Gy boost in 3 fractions to the tumor bed using intensity-modulated radiation therapy. She experienced Grade 1

minor acute radiation dermatitis during radiotherapy but was cured one month later with no treatment.

Nine months later, an eruption of violaceous, polyan-gular, and pruritic papules were observed at the boost irradiation site (Figure 1). Fine and white lines on the top of the purple papular skin lesions, also known as Wickham Striae, were not detected. Based on the clinical appearance and the history of radiation therapy, a diagnosis of lichenoid dermatitis was made. Since the possibility of local recurrence of breast cancer was considered low, a biopsy was not performed, and the application of the steroid ointment and oral antihistamines were started without biopsy. With two weeks of treatment, her lichenoid dermatitis was completely relieved. During the 5-year follow-up period, there was no recurrence of breast cancer or flare of lichenoid dermatitis.

### Discussion

The term “lichenoid” refers to a papular lesion of certain skin disorders, with lichen planus as the prototype [1-4]. On histologic examination, the lichenoid lesion is characterized by infiltration of lymphocytes and histo-



**Figure 1.** Reddish-brown plaque developed on her right breast. Lichenoid dermatitis is recognized in the same site as the part irradiated with high dose

cytes that fill the superficial dermis in a band-like fashion and obscures the dermo-epidermal junction. Vacuolar degeneration of the basal keratinocytes has been also reported [8]. Pathogenesis of lichenoid dermatitis is suggested as an immune-mediated reaction to the basal keratinocytes, which might explain both the presence of an inflammatory cell infiltrate and the vacuolar degeneration of the basal keratinocyte layer [8, 9].

In cancer treatment, radiation therapy and immune checkpoint inhibitor therapy are considered as pathogenic factors because both of them activate immune response [10, 11]. In this case, hypofractionated radiation therapy with tumor bed boost was thought to be the possible cause of lichenoid dermatitis because lichenoid reaction occurred in the area irradiated with more doses. Since hypofractionated radiation therapy reduces recruitment of myeloid-derived suppressor cells and decreases the expression of programmed death-ligand 1 on tumor cells compared with conventional fractionated radiation therapy [12], hypofractionated radiation therapy has a risk of developing a stronger immune response than conventional fractionated one.

Recently, due to advances in radiation therapy technology, the number of cases in which hypofractionated radiation therapy is adapted is increasing [13, 14]. It is also expected that the number of cases administering the immune checkpoint inhibitor therapy will increase. As lichenoid dermatitis rarely develops after conventional fractionated radiation therapy but may develop after hypofractionated radiation therapy, skin adverse events should be carefully observed. A biopsy may be performed to obtain a definite diagnosis, but if a malignant skin lesion is not suspected, a routine biopsy is not recommended because of the high risk of complications [9-11, 15].

In conclusion, a single case report cannot be generalized to others without further scientific validation; however, lichenoid dermatitis can develop after hypofractionated radiation therapy, and careful follow-up observation is necessary.

## Ethical Considerations

### Compliance with ethical guidelines

All ethical principles were considered in this article. The participant was informed about the purpose of the research and its implementation stages.

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## Conflict of interest

The authors declared no conflict of interest.

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