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CASE REPORT

Can Oral Traditional Chinese Medicine Be a New Option for Improving Acute Radiation Dermatitis? A Case Report of a Breast Cancer Patient

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Over 90% of cancer patients undergoing radiation therapy suffer from the distressing effects of acute radiation dermatitis (ARD), with breast cancer patients being particularly affected. Although there are conventional preventive, care, and treatment plans for ARD, there is still a need for improvement. The efficacy of oral application of traditional Chinese medicine (TCM) in treating ARD is rarely discussed in existing medical literature. Here, we report the case of an 86-year-old female with invasive ductal carcinoma of the left breast, who developed ARD 2 weeks after undergoing radiation therapy following surgery. Despite the use of conventional medications orally and topically, symptoms showed no significant improvement. After 2 months of oral TCM, the symptoms improved from Grade II to normal. This clinical case provides a new perspective that oral TCM can also improve ARD.

Key words: Radiation therapy, acute radiation dermatitis, breast cancer, traditional Chinese medicine, traditional Chinese herbal medicine

INTRODUCTION

Radiation dermatitis is one of the most common side effects of radiotherapy in cancer patients, with a higher incidence among breast cancer patients due to the elevated radiation dose received by their skin.[1] Acute radiation dermatitis (ARD) occurs within 90 days after treatment initiation and presents symptoms such as erythema, hyperpigmentation, epilation, dry and moist desquamation, ulceration, necrosis, and bleeding.[2] Effects of conventional strategies, including adjusting radiation doses/fractionations, cleanliness, moisturizing, and topical corticosteroids, are suboptimal.[3] While some studies focused on topical use of traditional Chinese medicine (TCM) such as aloe,[4] chamomile,[5] and calendula for ARD, internal (i.e., oral) application of TCM is rarely discussed. Here, we present a breast cancer patient undergoing oral TCM for ARD.

CASE REPORT

An 86-year-old female was diagnosed with Grade II invasive ductal carcinoma of the left breast (upper outer quadrant) in June 2022 (pT1c [2 cm], N0 [0/12], M0, Stage IA, ER 80% 3+, PR 50% 3+, Her2/neu [−], Ki67 30%, LVSI [−], PNI [−], and TIL 5%). She underwent breast-conserving surgery on July 22, followed by irradiation from August 8 to September 22 (16 × 266 cGy to the left whole breast [hypo-fractionation] + boost 5 × 2 Gy), and endocrine therapy (letrozole).

She developed ARD at the irradiated site 1–2 weeks thereafter. Despite using acetaminophen, applying moisturizing lotion, and conventional treatments, improvement was limited, leading to mood, sleep quality, and quality of life deterioration. She visited our TCM clinic on September 26, approximately 7 weeks after completing radiation, with skin presenting dark red color, black discoloration, small scabs around the left nipple, peeling of the left breast epithelium, subcutaneous swelling, hardened texture, pain, and moist desquamation [Figure 1].

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Reimbursed by Taiwan's National Health Insurance, she received "powder" t.i.d., consisting of 10 herb types: *Rehmannia glutinosa* 2.0 g, *Moutan Radicis Cortex* 2.0 g, *Mori folium* 1.5 g, *Mentha canadensis* 1.5 g, *Origanum vulgare* 2.5 g, *Polygonatum odoratum* 2.0 g, *Atractylodes macrocephala* 1.0 g, *Glycyrrhiza uralensis* 1.5 g, *Fritillaria* 2.0 g, and *Scrophularia ningpoensis* 2.0 g/day. The total dose was 18.0 g/day, taken half an hour before each meal.

From September 26 to November 14, her mood, sleep quality, and quality of life have all subjectively improved gradually, and the lesion appearance is shown in Figures 2 and 3. ARD severity rating[6] is documented in Table 1.

DISCUSSION

Damage to basal keratinocytes, hair follicle stem cells, and melanocytes during radiotherapy leads to irreversible DNA breakage within these cells. Repeated radiation exposure prevents the epidermis from self-renewal, resulting in pathological manifestations, including apoptotic keratinocytes, vacuolization of the basal layer, and epidermal edema. Epidermal necrosis, blister formation, and epidermal sloughing,[7] clinically referred to as moist desquamation, may occur. Changes in the dermis may include dermal and endothelial cell edema, vasodilation, erythrocyte extravasation, fibrin thrombi in vessels, and inflammatory infiltration throughout the dermis. In this case, erythema, edema, skin pigmentation, hair loss, and desquamation were all observed [Figure 1].

The goal of oral TCM is to alleviate the inflammatory response and rebuild the self-renewal capabilities of damaged skin. The formula contained 10 TCM kinds within 4 functional categories. First, *M. folium*, *M. canadensis*, and *O. vulgare* enhance circulation in the affected skin, improving inflammatory infiltration. Second, *P. odoratum*, *A. macrocephala*, and *G. uralensis* promote tissue cell renewal/repair. Third, *R. glutinosa* and Moutan Radicis Cortex alleviate localized dermal/endothelial cell edema, vasodilation, erythrocyte extravasation, and fibrin thrombi in vessels. Finally, *Fritillaria* and *S. ningpoensis* soften hardened tissue.[8-10]

Throughout treatment, the severity of erythema, edema, hyperpigmentation, hair loss, and desquamation gradually decreased, indicating the effectiveness of oral TCM in treating ARD.

The possible reason why TCM is more effective than the conventional treatment is that TCM can eliminate inflammatory products, stabilize local microcirculation, and promote self-repair and self-regeneration of the skin from inside to outside of the body, rather than simply treating local symptoms. As for whether TCM has the effect of preventing ARD, it will be very worthy of continued research in the future.

Table 1: Severity of the patient's acute radiation dermatitis at each follow-up date

Classification scale	Scores of the evaluation date		
	September 26, 2022	October 20, 2022	November 14, 2022
RTOG	3	1	0
NCI CTCAE	2	1	0
Radiation dermatitis severity	3.5	1	0.5

RTOG=Radiation Therapy Oncology Group; NCI CTCAE=National Cancer Institute Common Terminology Criteria for Adverse Events

Figure 1: Patient's left breast on September 26, 2022 (before oral traditional Chinese medicine therapy). The skin at the irradiated site exhibits a dark red color, blackening, and small scabs around the left nipple, peeling off the left breast epithelium, subcutaneous swelling, hardened texture, pain, and moist desquamation

Figure 2: Patient's left breast on October 20, 2022 (during oral traditional Chinese medicine therapy). The skin at the irradiated site shows a light red color, the skin around the left nipple changed from black to brown, fewer small scabs, less noticeable peeling of the left breast epithelium, reduced subcutaneous swelling, softer texture, decreased pain, and less moist desquamation

Figure 3: Patient's left breast on November 14, 2022 (upon completion of oral traditional Chinese medicine). The skin at the irradiated site had almost returned to normal color, the skin around the left nipple had changed from dark brown to light brown, significantly fewer small scabs, no peeling of the left breast epithelium, disappearance of subcutaneous swelling, soft texture, no pain, and no desquamation

CONCLUSION

This case demonstrates oral TCM can be an option for ARD management.

Ethical approval statement

The study has been performed in accordance with the Declaration of Helsinki, and approved by the ethics committee of Tri-Service General Hospital, Taipei, Taiwan (IRB approval number: B202405086; approval date: 5/3/2024).

Declaration of patient consent

The authors certify that they have obtained the appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published, and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

Data availability statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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