

LETTER

Radiation-induced morphea – a rare, but not to be dismissed, adverse effect of radiotherapy

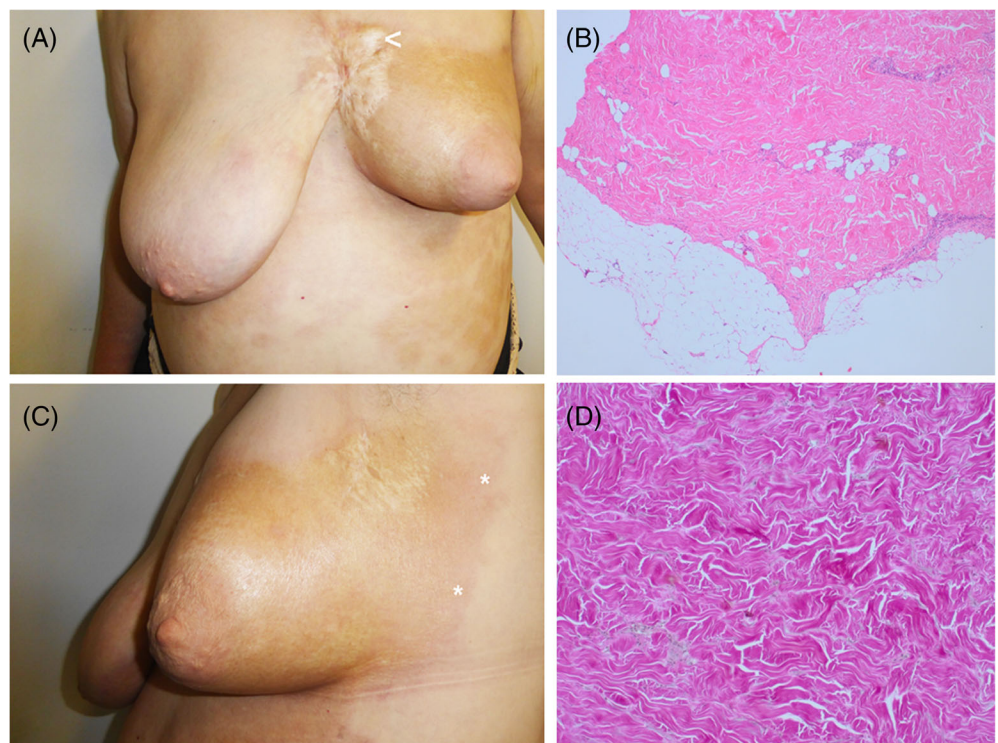
Dear Editor,

Chao Li et al. recently described patient with morphea profunda in this journal who was treated with superficial X-ray radiotherapy and hydroxychloroquine.¹ They concluded that this method produced a positive clinical effect rapidly, while causing fewer side effects compared to other standard therapies.¹ Here, we report a breast cancer patient who developed severe morphea after adjuvant radiotherapy.

A 66-year old female was admitted to our department with disseminated fibrotic skin lesions. This patient had a history of invasive ductal carcinoma of the left breast, classified estrogen receptor (ER) positive (ER+) [95%], progesterone receptor (PgR) positive (PgR+) [95%], HER-2/neu receptor negative, with a cell proliferation score (Ki-67) of 10% [type luminal A; pT1c(1.3 cm) pN0(0/3)sn,G2,R0,L1,M0]. Following segmentectomy and sentinel lymph node biopsy at the end of 2018, adjuvant local radiotherapy

of the left breast was initiated in February 2019 using a 6 and 15 MV linear accelerator, respectively. By means of 5x1.8 and 2.25 Gy/week as a simultaneous integrated boost, a total of 50.4 Gy for the left breast and 63 Gy for the tumor bed was applied, respectively. After radiotherapy, the patient noticed a loss of volume in her left breast together with the occurrence of skin changes. Clinical examination revealed a significant volume reduction of the left compared to the right breast as well as an old (childhood) burn scar in the sternal region. In addition, the patient presented with disseminated reddish-brownish fibrotic plaques on and around the left breast, axillary region, flank, and groin (Figure 1). Histopathology of two skin biopsies revealed pronounced fibrosis with thickened collagen bundles expanding from the dermis into the subcutis. Moreover, atrophic sweat glands surrounded by collagen fibers and rarification of adnexal structures were observed (Figure 1). Based on these findings, a case of

FIGURE 1 A significant volume reduction of the left breast following adjuvant radiotherapy for breast cancer [arrow head: old burn scar, (A)] There were disseminated reddish (*, C) and brownish fibrotic plaques on and around the left breast, axillary region, and flank. Hematoxylin–eosin histopathology (magnification, $\times 40$) showing pronounced fibrosis with thickened collagen bundles expanding from the dermis into the subcutis (B). Moreover, loss of elastic fibers (D, Verhoeff–Van-Gieson stain, magnification, $\times 250$)



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radiation-induced morphea (RIM) was diagnosed. In order to prevent further breast volume reduction and spread of the skin fibrosis, the patient was treated with intravenous high-dose prednisolone (1000 mg) for 3 days every 4 weeks combined with 15 mg methotrexate s.c. once per week. After an 8-month therapy, the erythematous lesions disappeared and the degree of skin fibrosis was moderately reduced.² Then four additional treatment cycles were scheduled.

RIM was first described in the year 1905, following the discovery of X-rays and its introduction in medicine. Between 1989 and 2021, about 97 cases of RIM have been reported in the literature.^{3–5} Partl et al. recently conducted a large study on the prevalence of RIM and found that among 2268 breast cancer patients, six patients (0.26%) were diagnosed with RIM, which translates into one case for every 378 patients receiving radiotherapy.⁶ On the basis of this relatively high incidence, they concluded that in a large number of patients, morphea might often be incorrectly diagnosed as radiodermatitis (early stage) or radiation-induced fibrosis (late stage). The large majority of reports relate to adjuvant radiotherapy of the breast and usually manifest within 1 year after radiotherapy. There was no relationship with different clinical parameters of radiotherapy, including total dose, single dose, patient age, and so forth. RIM was found to be located within the irradiation field, but was also found in disseminated patterns as illustrated in the present case. Taken together, since Li et al. concluded that superficial X-ray radiotherapy presents an effective and relatively safe treatment option for morphea profunda, we were prompted to remind the readers of this journal of RIM – a relatively rare, but potentially severe and disfiguring side effect of radiotherapy.¹

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.


AUTHOR CONTRIBUTIONS

Thilo Gambichler, the corresponding author was one of the treating physicians and prepared the manuscript; he substantially interpreted the clinical data and made the diagnosis. Christina H. Scheel, was one of the treating physicians and edited the manuscript. Stefanie Boms,

was the main treating physician; she extracted and collected the patient's data. All authors read and approved the final manuscript.

DATA AVAILABILITY STATEMENT

All crucial data generated or analyzed during this case study are included in this published article.

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