Postradiation breast erythema, skin thickening, and peau d'orange

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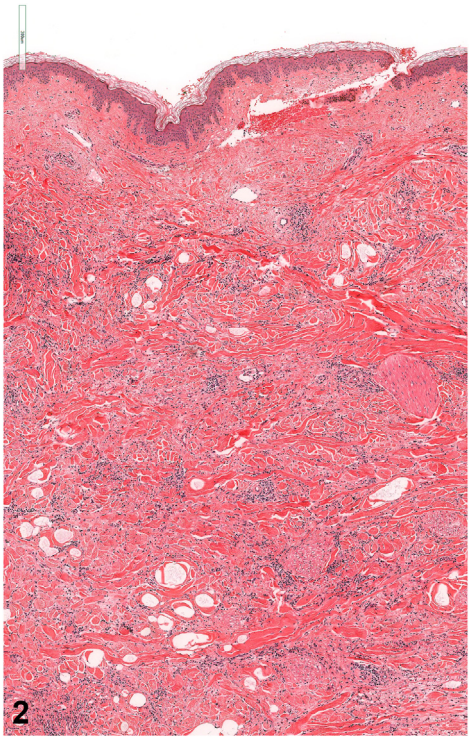

HISTORY

A 69-year-old woman developed erythema and skin thickening on her breast 1 year after ipsilateral breast cancer therapy, which included lumpectomy, adjuvant chemotherapy (adriamycin, cyclophosphamide, and paclitaxel), and whole breast radiation (42.5 Gy in 16 fractions with boost to 48 Gy). Within a month of presentation, there was erythema across the whole breast, fullness, nipple stretching, skin thickening, and peau d'orange (Fig 1). The deeper tissue was soft and pliable, with no palpable masses. She denied pain, fever, and other constitutional symptoms. A punch biopsy showed dermal thickening and fibrosis and pronounced perivascular inflammation with the infiltration of lymphocytes (Fig 2).

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Question 1: Which of the following is the most likely diagnosis?

A. Acute radiation dermatitis

B. Carcinoma *en cuirasse*

C. Cellulitis

D. Postirradiation fibrosis

E. Radiation-induced morphea (RIM)

Answers:

A. Acute radiation dermatitis — Incorrect. Acute radiation dermatitis may resemble the above lesion, but, unlike RIM, it presents in a more acute time frame and is histologically characterized by edema, vasodilation, thrombi, and erythrocyte extravasation.[1]

B. Carcinoma *en cuirasse* — Incorrect. Though cutaneous metastases of breast cancer most commonly present as solitary to multiple erythematous infiltrating papules and nodules, carcinoma *en cuirasse* may resemble the above lesion. Carcinoma *en cuirasse* may be histologically characterized by the infiltration of atypical cells (arranged in dense linear sheets) within the dermis and lymph vessel obstruction.[1,2]

C. Cellulitis — Incorrect. Cellulitis may resemble the above lesion and may even cause peau d'orange. However, it is typically poorly demarcated and presents with pain (whereas RIM is more often painful in its later stages). Additionally, cellulitis is histologically characterized by the perivascular infiltration of neutrophils, dermal edema, and lymph vessel dilation.[1,3]

D. Postirradiation fibrosis — Incorrect. Postirradiation fibrosis may resemble the above lesion, but, when histologically compared to RIM, it lacks significant inflammatory infiltration and has fibrosis in deeper skin layers (ie, subcutaneous/fascial).[1]

E. RIM — Correct. This clinical picture is most consistent with RIM, which is generally an erythematous, edematous plaque that progresses to induration, violaceous discoloration, peau d'orange, and pain in its later stages. The early stages are histologically characterized by slight dermal collagen thickening and the perivascular/periadnexal infiltration of lymphocytes, and the later stages by prominent dermal fibrosis and a loss of periadnexal adipose tissue and lymphocyte infiltration.[1]

Question 2: How would you manage this condition?

A. Topical calcipotriene

B. Topical corticosteroids

C. Topical tacrolimus

D. Topical therapy plus systemic methotrexate

E. Watch and wait

Answers:

A. Topical calcipotriene — Incorrect. Many treatments have shown some efficacy in RIM, including topicals (eg, steroids, calcipotriene, tacrolimus), systemic medications (eg, prednisone, methotrexate), and phototherapy (eg, narrow-band ultraviolet B).[1,4,5] However, those receiving systemic methotrexate or phototherapy may respond better than those receiving only topical therapy.[4]

B. Topical corticosteroids — Incorrect. Many treatments have shown some efficacy in RIM, including topicals (eg, steroids, calcipotriene, tacrolimus), systemic medications (eg, prednisone, methotrexate), and phototherapy (eg, narrow-band ultraviolet B).[1,4,5] However, those receiving systemic methotrexate or phototherapy may respond better than those receiving only topical therapy.[4]

C. Topical tacrolimus — Incorrect. Many treatments have shown some efficacy in RIM, including topicals (eg, steroids, calcipotriene, tacrolimus), systemic medications (eg, prednisone, methotrexate), and phototherapy (eg, narrow-band ultraviolet B).[1,4,5] Indeed, for limited plaque morphea, tacrolimus has been recommended as a first-line topical option.[1] However, those receiving systemic methotrexate or phototherapy may respond better than those receiving only topical therapy.[4]

D. Topical therapy plus systemic methotrexate — Correct. Many treatments have shown some efficacy in RIM, including topicals (eg, steroids, calcipotriene, tacrolimus), systemic medications (eg, prednisone, methotrexate), and phototherapy (eg, narrow-band ultraviolet B).[1,4,5] However, those receiving systemic methotrexate or phototherapy may respond better than those receiving only topical therapy.[4]

E. Watch and wait — Incorrect. Although RIM does regress spontaneously in some cases, this is likely not common, and earlier treatment is associated with better outcomes.[1,4,5]

Question 3: Which is NOT likely to affect a person's risk for developing this condition?

A. History of autoimmune disorders

B. Patient sex

C. Obesity or larger breast size

D. Smoking

E. Type and dose of radiation

Answers:

A. History of autoimmune disorders — Incorrect. This is a proposed risk factor for RIM.[5]

B. Patient sex — Incorrect. Being female is a strong risk factor for RIM, which most often occurs following radiation for breast cancer.[1,5]

C. Obesity or larger breast size — Incorrect. These are proposed risk factors for RIM.[1,5]

D. Smoking — Incorrect. This is a proposed risk factor for RIM.[5]

E. Type and dose of radiation — Correct. This is not a known risk factor for RIM.[1,5]

Abbreviation used:

RIM: radiation-induced morphea

Conflicts of interest

None disclosed.

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