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Case Report

Radiation induced depigmentation disorder in two patients with breast cancer: Exploring a rare accompaniment

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Abstract Radiation induced depigmentation disorder is a rare accompaniment. We herein report two patients of bilateral breast cancer developing depigmentation disorder, initially confined to the radiation portal with subsequent generalization within few months of completion of whole breast radiotherapy. Both these patients had no prior history of vitiligo or other autoimmune disorder. This brief report highlights the importance of awareness of this association in appropriate decision making in susceptible patients thereby preventing this morbidity and its psychological ramifications.

Introduction

Radiotherapy is known to cause hyperpigmentation of the skin. Hypopigmentation or depigmentation of the skin in the radiation portal is relatively uncommon. In patients with a history of vitiligo, depigmentation of the skin in the radiation portal has been described in patients of cancer of breast or other sites [1–4]. This is commonly ascribed to Koebner's phenomenon and apoptosis of susceptible melanocytes due to radiation induced free radical mediated damage [1–4]. However such an event in patients without predisposition is extremely rare. We have brought into focus two patients of bilateral breast cancer developing depigmentation disorder, initially confined to the radiation portal with subsequent generalization within few months of completion of whole breast radiotherapy. This report emphasizes the importance of awareness of this rare radiation accompaniment in appropriate decision making in vulnerable patients thereby preventing this morbidity and its psychological consequences.

Clinical case 1

A 40 year old premenopausal woman presented with progressively increasing painless lump in the right breast. She did not have any past or family history of depigmentation disorder. Bilateral mammogram suggested lesions in both breasts, BIRADS IV. Trucut biopsy from right breast lump showed infiltrating ductal carcinoma (IDC). The tumor expressed estrogen and progesterone receptor and was negative for Her2/neu receptor. The possibility of invasive cancer could not be ruled out from fine needle aspiration cytology (FNAC) from the left breast lump. FNAC from right axillary lymph

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node also revealed infiltrating carcinoma. Baseline positron emission tomography-computed tomography (PET-CT) scan showed a 5×4 cm lesion in upper outer quadrant of the right breast with overlying skin thickening. Another lesion of size 0.8×1 cm with mild fluorodeoxyglucose (FDG) uptake was discerned below the larger lesion. There was a 2.5×1.6 cm lesion in upper outer quadrant of the left breast. Bilateral axillary lymph nodes were enlarged. Bilateral pulmonary metastases and multiple sclerotic lesions in the right acetabulum, right ala of sacrum and neck of left scapula were observed. She was diagnosed with bilateral breast cancer; right cT4bN2M1 and left cT2N1M1 and was administered 6 cycles of systemic chemotherapy with DE regimen (Inj. Docetaxel 75 mg/m^2 IV D1; Inj. Epirubicin 80 mg/m^2 IV D1 q 3 weekly). She attained good symptomatic relief and partial response to chemotherapy (2.7×2.2 cm residuum in the right breast and no residuum in the left breast with complete resolution of pulmonary and osseous metastases). She was offered the options of mastectomy and breast conservation therapy and in view of young age she chose the latter. Subsequently she underwent bilateral breast conservation surgery (wide local excision of lump with axillary lymph node dissection). The post-operative histopathology report showed tumors of size $2 \times 1.5 \times 1$ cm in the right breast and $1 \times 1 \times 0.5$ cm in the left breast, IDC. The biomarker status was noted to be estrogen and progesterone receptor positive and Her2/neu receptor negative. All margins were free. Four out of 13 lymph nodes in the right axilla and 4 out of 12 lymph nodes in the left axilla were found to be involved. She received bilateral locoregional radiotherapy to breast, supraclavicular fossa and axilla 50 Gray/25 fractions/5 weeks followed by boost 16 Gray/8 fractions/1.5 week. Radiation to the breast was planned by bitangential fields with 15°wedge pair using Cobalt 60 gamma (γ) rays (average energy 1.25 MeV) on Theratron (TH) 780E machine (Kirloskar Technologies private limited). A direct field was used with Cobalt 60 gamma (γ) rays to cover the supraclavicular fossa and axilla and dose was prescribed at a depth of 4 cm. Subsequently she was started on tablet Tamoxifen 20 mg OD and Inj. Zoledronic acid 4 mg IV 4 weekly.

Three months after completion of radiotherapy she developed nonpruritic depigmented patches, initially involving the breast, chest wall and neck. Gradually within 4 and 5 months it generalized involving the upper and lower extremities, abdomen and groin. There was no associated induration, atrophy or scaling of skin (Fig 1A–C). The patient did not opt for repigmentation therapy. Follow-up PET-CT scan showed progressive disease in the bone. She received palliative RT 8 Gray/single fraction to painful bony sites and hormonal therapy was changed to Inj. Goserelin 10.8 mg subcutaneous q 3 month along with tablet Letrozole 2.5 mg OD. Following further progression in bone disease hormonal therapy was changed to Inj. Goserelin 10.8 mg subcutaneous q 3 month along with tablet Exemestane 25 mg OD and tab Ibandronate 50 mg OD was added.

Clinical case 2

A 58 year old postmenopausal woman presented with progressively increasing painful lump in the right breast. She did not have any past or family history of depigmentation disorder. Bilateral mammogram suggested a lesion in the right breast, BIRADS 5. She underwent right sided breast conservation surgery (wide local excision of lump with axillary lymph node dis-

Fig. 1 Depigmented patches in patient 1 involving (A) breast, chest wall and neck (B) upper extremities (C) lower extremities. Depigmented patches in patient 2 involving (D) breast, chest wall, neck and upper extremities (E) coalescing in the radiation portal for whole breast radiotherapy (F) scalp and around body orifices like the mouth, nose and eyes.