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POSTIRRADIATION HEMANGIOSARCOMA OF THE CHEST WALL

Report of a case

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Abstract

An unusual case of cutaneous hemangiosarcoma that developed on a chest wall irradiated after mastectomy for cancer is described. The patient, an elderly woman, had previously received high-dose radiation to the chest wall as well as systemic combination chemotherapy. Sarcoma developed 6 years after mastectomy and progressed rapidly. The time between radiation therapy and occurrence of cutaneous sarcoma was shorter than the median latent period reported for development of radiation-induced sarcoma. Thus, we cannot be certain that radiation was the true or sole etiologic factor. Whether the addition of systemic chemotherapy was a contributory agent is also speculative.

Malignancy after postmastectomy irradiation of the chest wall is very uncommon, although known cases have been well documented in the literature (1–5, 9, 14–18, 22, 24). The majority of these tumors were bone and soft tissue sarcomas. TRAVIS et coll. (23) described malignant mesenchymoma of the chest wall, and OBERMAN & ONEAL (12) reported a case of fibrosarcoma involving the skin of a mastectomy scar. Although it is well known that lymphangiosarcoma may develop in a chronically edematous arm with or without previous malignancy or previous chest wall irradiation (6, 19, 25), to our knowledge only one case of cutaneous hemangiosarcoma arising on the irradiated chest wall of a human has been reported (8). The present report describes another unusual case of cutaneous hemangiosarcoma that developed on the chest wall of an elderly woman after irradiation.

Case report

In 1977 a 76-year-old woman noticed a 4-cm mass with puckering of the skin in the outer upper quadrant of the right breast. A small lymph node was felt in the axilla. The interpretation of mammograms was consistent with carcinoma of the right breast. Chest films and bone scan showed no evidence of metastatic disease. A modified mastectomy was performed, and histology showed poorly differentiated adenocarcinoma involving 5 of 11 axillary lymph nodes as well as axillary fat (Fig. 1). Estrogen receptor status was not determined. Because of the patient's age, adjuvant systemic chemotherapy was declined at that time. In view of the high risk of local recurrence, the patient received postoperative radiation therapy to a total dose of 50 Gy in 33 fractions to the entire right chest wall and the associated lymphatics. Treatments were given on a 4 MeV linear accelerator with 4 MV roentgen rays.

Four months after completion of radiation therapy mild lymphedema of the right arm and clinical signs of cellulitis of the right lateral chest wall developed and did not respond to antibiotics. A month later the skin on the right lateral chest wall showed peau d'orange appearance, and the patient had progressive swelling of the right arm. No lymph nodes were palpable. This was consistent clinically with tumor infiltration of the chest wall. Additional radiation therapy was given with 4 MV roentgen rays to 30 Gy in 18 fractions to the chest wall. The results of bone and liver scans were negative.

Accepted for publication 4 November 1984.

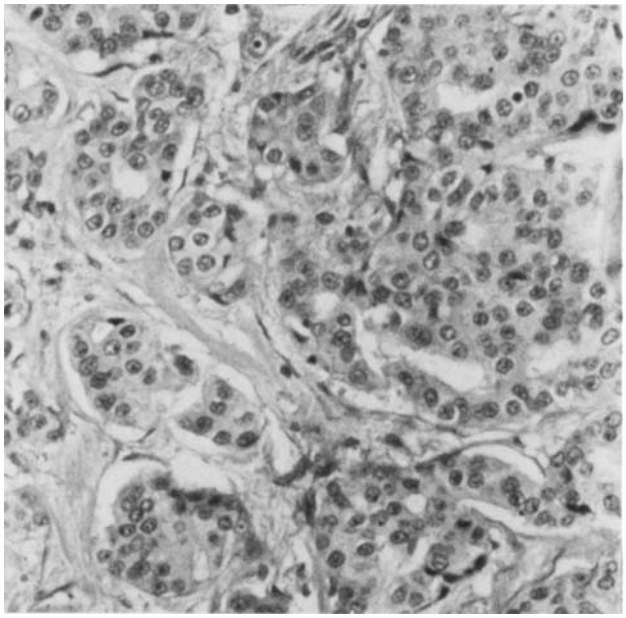

Fig. 1

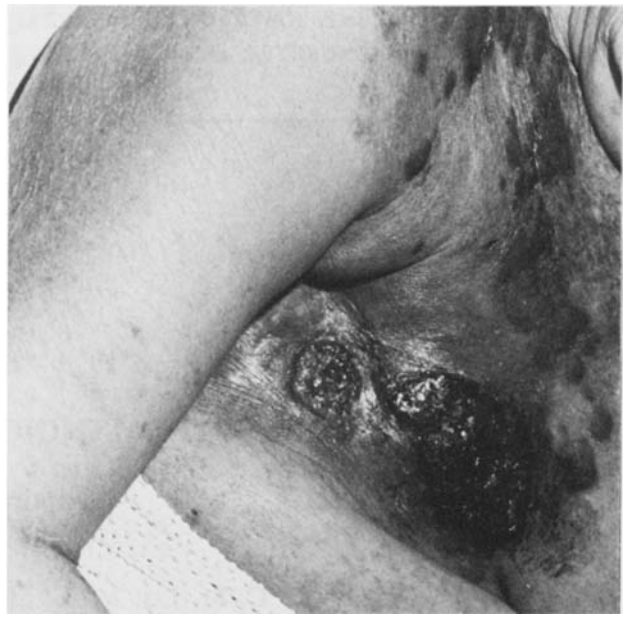

Fig. 2

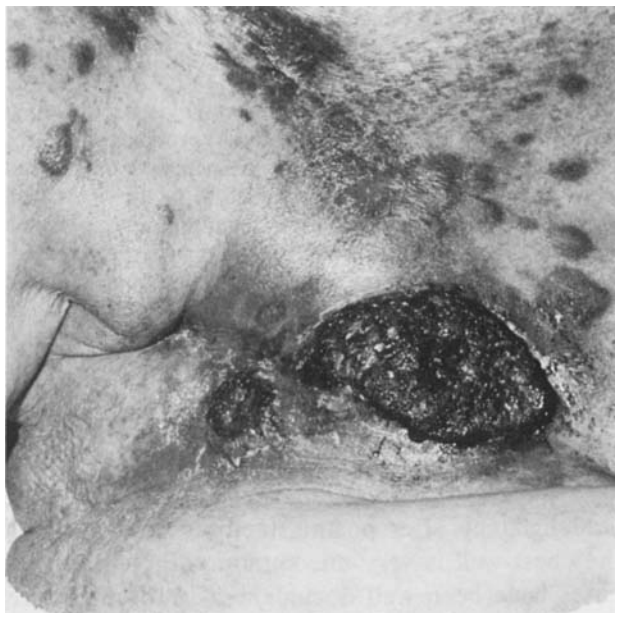

Fig. 3

Fig. 1. Typical pattern of infiltrating duct carcinoma seen in mastectomy specimen (hematoxylin-eosin, ×100).

Fig. 2. Violaceous lesions on right chest wall extend to shoulder without involvement of edematous arm.

Fig. 3. Lesions developed on site of mastectomy performed 6 years earlier.

The patient continued to have persistent lymphedema of the right extremity. Systemic treatment with diethylstilbestrol and tamoxifen citrate was attempted but was discontinued because of poor patient tolerance, and no further treatment was given.

Two years later, progressive bone metastases developed, with progressive right pleural effusion. The patient was treated with cyclophosphamide, methotrexate, and 5-fluorouracil.

Two years after chemotherapy was initiated, severe pain developed in her right shoulder, and radiography showed osteolytic metastasis in the right scapula. She was treated with 4 MV roentgen rays with a single posterior field to 14 Gy in 7 fractions and reported complete relief of pain. Progesterone was then prescribed as systemic therapy and was well tolerated.

Three months later, the patient noticed dark violaceous lesions developing on her right anterior chest wall over the mastectomy site and extending to her shoulder (Figs 2, 3). Biopsy showed hemangiosarcoma. These lesions progressed rapidly and were unresponsive to chemotherapy. The patient died from bilateral pneumonitis approximately 6 months after diagnosis of sarcoma and 6 years after diagnosis of breast carcinoma.

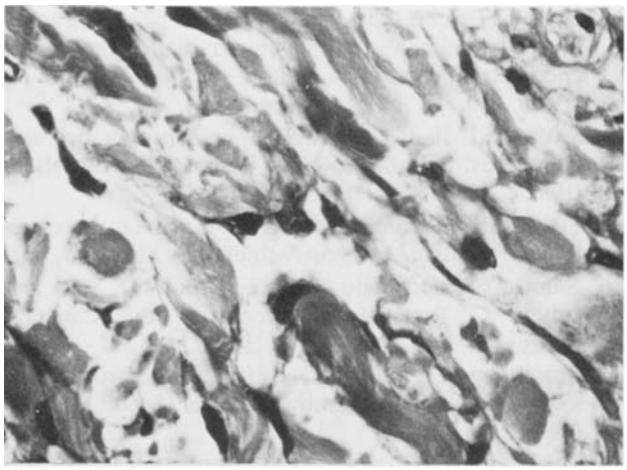

Fig. 4. Irregular thin-walled vessels permeate dermal structures. The endothelial nuclei are densely hyperchromatic and protrude into the lumen (periodic acid-Schiff stain, ×200).

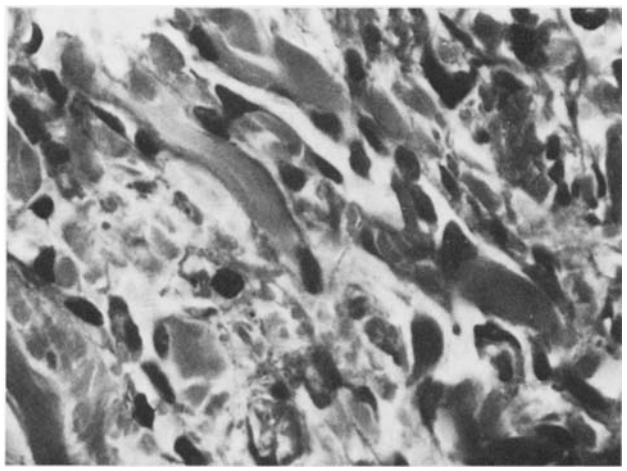

Fig. 5. Some foci of the tumor are only barely discernible as vascular in nature. The lumen is reduced to a narrow slit and is lined by malignant endothelial cells (periodic acid-Schiff stain, ×200).

Histopathologic findings

Biopsy of the violaceous skin lesions demonstrated the typical histologic findings of cutaneous hemangiosarcoma. The tumor was comprised of a poorly delimited infiltration of small blood vessels that insinuated between the various structures of the dermis and skin appendages. These neoplastic vessels displayed marked nuclear hyperchromasia with prominent mitotic figures and a tendency for intraluminal papillary formations. In some foci the tumor appeared deceptively bland with only the location of the vessels being indicative of their neoplastic nature (Figs 4, 5).

Discussion

Cutaneous hemangiosarcoma is rare. The usual locations are the face and the scalp of elderly patients. CIRARD et coll. (7) reported 28 patients with cutaneous hemangiosarcoma with only one case on the chest wall.

Most of the irradiation-induced sarcomas arise from either soft tissue or bone (1–5, 9, 14–18, 22, 24). In 1972 TALERMAN (21) described the first experimental radiation-induced angiosarcoma in a rat. In 1973 MCSWAIN et coll. (11) described a woman who had received postmastectomy irradiation and in whom hemangiosarcoma later developed on an edematous arm and subsequently metastasized to the chest wall and lungs. PAIK & KOMOROWSKI (13) in 1976 reported a case of hemangiosarcoma of the abdominal wall after radiation therapy for carcinoma of the uterus.

HAMELS et coll. (8) recently described a patient with cutaneous hemangiosarcoma that developed in an irradiated mastectomy scar. Likewise, in our patient an aggressive cutaneous hemangiosarcoma appears to have arisen on a previously irradiated chest wall, although postmastectomy lymphedema of the extremity also developed. Pathologically, this lesion satisfies the criteria described by STOUT (20).

This patient received a cumulative radiation dose of 80 Gy to the right chest wall over 8 months with 4 MV roentgen rays, but her skin never showed noticeable effects of radiation. Instead, clinical findings were more consistent with persistent tumor infiltration, which later became progressive and metastatic. The time between radiation therapy and development of cutaneous angiosarcoma was 5 years, which is shorter than the median latent period of more than 10 years reported for development of radiation-induced sarcoma (10) although a few cases with latent periods between 3 and 5 years have been described (1, 3, 9, 10, 12, 15). We cannot be certain that radiation is the true or sole etiologic factor in our patient. Whether the addition of systemic chemotherapy played a role is also speculative. We can only conclude that this is an unusual case of cutaneous hemangiosarcoma that developed on a chest wall after irradiation.

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