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# Angiosarcoma of the Breast After Conservative Surgery and Radiation Therapy for Breast Carcinoma: Three New Cases

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We report 3 cases of breast angiosarcoma which arose in patients who had received conservative treatment including radiation for adenocarcinoma of the breast.

*Patient* 1

A 59-year old woman presented with two tumours (measuring 7.5 cm and 1.5 cm) in her left breast. The patient has been treated 4 years previously for a pT2pN0 medullary carcinoma of the same breast. After lumpectomy, 45 Gy was delivered to the whole breast, followed by a boost of 15 Gy to the tumour bed. The mastectomy specimen showed a bifocal grade III angiosarcoma [1]. Nine months after simple mastectomy, the patient experienced spinal and pulmonary metastases and a left chest wall recurrence. Chemotherapy did not prevent progression. The patient died 14 months after mastectomy.

*Patient* 2

A 49-year old woman presented with an inflammatory and ecchymotic infiltration (18 × 15 cm) in the her left breast. The patient had been treated 6.5 years previously by lumpectomy and radiation (doses unknown) for a pT1pN0 carcinoma of the same breast. The mastectomy specimen revealed a multifocal grade I angiosarcoma of the skin infiltrating the underlying parenchyma. Four months after simple mastectomy, the patient experienced a local recurrence. Despite chemotherapy, she died of regional disease progression 19 months after the mastectomy.

*Patient* 3

A 66-year old woman presented with a violaceous tumour (3.5 × 3 cm) in the nipple of her left breast. The patient had been treated 4.5 years previously for a pT1pN0 carcinoma of the same breast. After lumpectomy, 45 Gy was delivered to the whole breast, followed by a boost of 15 Gy to the tumour bed. The biopsy of the nipple tumour disclosed a multifocal grade II angiosarcoma. Eighteen months after simple mastectomy, there is no evidence of disease.

Including the cases from the Gustave-Roussy Institute, 33 cases of angiosarcoma diagnosed in a breast previously treated by conservative surgery and radiation for carcinoma have been reported [2–10]. Angiosarcoma developed 29–150 months (mean: 66 months) after the local treatment of the adenocarcinoma. Radiation doses to the whole breast ranged from 40–56 Gy (30 patients). A boost to the tumour bed (10–25 Gy) was delivered in 24 cases. Seven sarcomas were grade III, 4 grade II and 6 grade I. The local treatment was a total mastectomy in all but 4 patients. Tumour recurred locally in 15 cases, with a mean interval of 8 months. After a mean follow-up time of 18 months, 10 patients (out of 28) had died. So far, angiosarcomas arising in a breast treated by radiation are similar to those arising in a previously healthy breast.

These cases raise the question whether radiation therapy may 'induce' angiosarcoma in the irradiated breast. To confirm this hypothesis, it would be necessary to show (by a case–control study) that the radiation therapy of the patients who develop angiosarcoma after conservative treatment for carcinoma was in some way different from the radiation therapy of similarly treated patients who have no angiosarcoma after a comparable time of follow-up.

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