

# Radiation-Induced Angiosarcoma of the Breast Following Breast-Conserving Therapy for Ductal Carcinoma: A Case Report

Brandon Dessecker<sup>1</sup>, Ravindra Sachdeva<sup>2</sup>

<sup>1</sup>Northside Regional Medical Center, USA, <sup>2</sup>Sharon Regional Medical Center, USA

## ABSTRACT

Radiation-induced angiosarcoma of the breast (RIAB) is an exceedingly rare secondary malignancy arising from prior radiation therapy. They are both difficult to diagnose and treat and are noted to have high rates of local recurrences. We present a case of a 59-year-old female who presented with RIAB 5 years after undergoing breast-conserving therapy for invasive ductal carcinoma.

**Key words:** Angiosarcoma, breast cancer, radiation-induced angiosarcoma of the breast

## INTRODUCTION

**R**adiation-induced angiosarcoma of the breast (RIAB) is a secondary malignancy resulting from prior radiotherapy. These are rare tumors and require local control with surgical excision.

## CASE REPORT

A 59-year-old female represented to her surgeon's office with worsening swelling of her left breast. She had been treated with a course of antibiotics and did not have any resolution. She complained of severe swelling and pain at the left breast. Furthermore, she was noted to have a small purple-red-colored nodule. Surrounding that nodule, she was noted to have erythema and peau d'orange changes.

Of note, she was previously treated for an invasive ductal carcinoma in her left breast as well. She had underwent lumpectomy and sentinel lymph node biopsy 5 years prior. She had a pT2 pN0 cM0 (Stage IIA) breast cancer at that time. Given this, she underwent whole breast radiation along with chemotherapy and completed her standard course.

Given her presentation, the initial concern was for either post-radiation skin changes versus an inflammatory breast cancer. The patient underwent a diagnostic mammogram to properly work her up, which revealed no parenchymal disease. She was evaluated with a breast ultrasound as well, which demonstrated skin thickening, and increased Doppler flow without any focal lesion.

With the imaging findings and her clinical picture, she was evaluated for a biopsy of her left breast. She was taken to the operating room for a tissue diagnosis. A skin and superficial breast tissue biopsy were performed taking care to include the nodule as described above. The dimensions measured 4 cm × 1.5 cm × 1 cm. There was minimal bleeding from the edges and no purulent or infectious findings. However, a culture was taken, which ultimately returned negative.

The biopsy was sent to pathology; and after analysis, it was ultimately consistent with a high-grade angiosarcoma. On histology, the biopsy revealed blood lakes and solid tumor with areas of necrosis. It was noted to have positive lateral margins with negative deep margins. Immunohistochemical stains were performed. Stains for CD31 and CD34 highlighted the vascular channels with tumor cells within them. The

### Address for correspondence:

Brandon Dessecker, 500 Gypsy Lane Graduate Medical Education, Youngstown, Ohio 44504, USA.  
Phone: (330)-401-4063. E-mail: bdessecker@neomed.edu

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tumor also stained positive for, P63, smooth muscle myosin, E-cadherin, pankeratin, and CK5/6, which helped to support the diagnosis of an angiosarcoma. Ki-67 was performed as well to evaluate tumor proliferation and was noted to be >80%. The specimen was sent to a tertiary care center for consultation, and the pathology department agreed with the initial reading.

Given the pathology of the tumor, discussion was had with the patient and mastectomy was recommended to the patient with the goal of obtaining negative margins. After extensive discussion, the patient elected to proceed to a tertiary care center for mastectomy, for which she is currently awaiting surgical management.

## DISCUSSION

Since the adoption of breast-conserving therapy (BCT) and the high use of radiation that accompanies it, RIAB began to present.<sup>[1]</sup> Current treatment is surgical, and it hinges on mastectomy with negative margins locally. The average time from radiation to the development of RIAB is approximately 7–9 years.<sup>[1,2]</sup> The prevalence is estimated at approximately 0.02% or 1/3754 patients.<sup>[3]</sup> With the increase in the use of BCT, especially given new neoadjuvant modalities and treatments, it is imperative that surgeons, radiation oncologists, and medical oncologists are aware of this tumor. The author's believes that with the

increase in BCT that the incidence of this tumor will begin to increase as well.

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