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Radiation Oncology

Secondary GIST after Radiotherapy for Breast Cancer: A Case Report

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Abstract **Case Report**

Introduction*:** Breast cancer mortality and disease recurrence are decreased by radiotherapy. But in exposed regions, it has also been linked to a higher chance of developing second cancer. Due to the small number of patients and low frequency of sarcoma, previous research assessing sarcomas as second malignant neoplasms in patients with breast cancer has been limited. ***Case Report: we report a case of female patient with a history of breast carcinoma that required radiotherapy she presented contralateral breast cancer 10 years after the first one, and a gastrointestinal stromal tumor of the stomach. ***Conclusion***: We reviewed the literature as well as the most recent guidelines and recommendations in order to describe the clinico-radiological aspects, potential causes, and methods for recognizing, managing, and preventing this problem.

Keywords: Breast Cancer, Radiotherapy, Second Malignant Neoplasm, Gastrointestinal Stromal Tumor (GIST), Contralateral Breast Cancer.

INTRODUCTION

In patients with breast cancer, radiotherapy (RT) is thought to increase the chance of developing soft-tissue and bone sarcomas [1, 2]. Since sarcomas are rare, it is impossible to determine the precise level of risk. Relatively few examples have served as the basis for earlier research on radiation-associated sarcoma in patients with breast cancer. However, more and younger patients are receiving multimodality treatment (including radiotherapy) for breast cancer due to expanded indications for RT and greater screening [3].

CASE PRESENTATION

A 55-year-old women was with a history of invasive breast cancer treated 10 years ago, underwent neo adjuvant chemotherapy, total mastectomy followed by irradiation in 2011. Radiotherapy delivering a dose of 40,08 gray to the left wall and supra clavicular areas at a rate of 2,67 gray per session, 5 sessions per week. Then she remained under hormonal therapy and surveillance.

In 2021 she developed a contralateral recurrence, so to detect distant metastases we demand a body scanner that showed a lesional process of the greater gastric curve suggesting a gist.

While continuing the treatment of the breast recurrence, we requested an upper digestive endoscopy which revealed an antral lesion opposite the large gastric curve of 2 cm, suggesting a gist. The biopsy revealed moderate chronic gastritis without atypia or metaplasia.

Following a multidisciplinary consultation meeting, the patient underwent an atypical gastrectomy with on pathological examination, it is an 8,5 cm spindle-cell tumor process whose appearance may be consistent with a gastric stromal tumor at low risk of recurrence p T3.

The patient was subsequently placed under surveillance with clinical and radiological stability.

DISCUSSION

It is well recognized that ionizing radiation is a powerful carcinogen [4], radiation-induced cancer can arise from natural causes, radiation accidents, or as a side effect of cancer treatment.

The latency periods for solid tumors linked to ionizing radiation exposure can reach 40 years [5]. About 6.7% of new malignancies in cancer survivors are second primary tumors [14], and up to 25% of all cancer survivors get breast cancer [6, 7]. Breast cancer survivors

continue to be at long-term risk for additional late effects of treatment, including heart disease, early menopause, and psychological and financial issues, in addition to cancer recurrence and second malignant neoplasms.

Several researchers have noted a higher prevalence of bone and soft-tissue sarcoma following breast cancer treatment [8, 9]. This can happen in the chest wall following a mastectomy, with or without postoperative adjuvant radiation, or in the breast following breast conservation therapy.

According to extensive single-institution retrospective investigations, the cumulative incidence rates for radiation-treated breast cancer patients at ten years are roughly two per 1,000.

11 radiation-induced sarcomas were found in 6,919 patients who were monitored for more than a year as part of the Gustave Roussy Institute investigation [10, 11].

There may be several genetic factors behind the development of sarcomas and/or a susceptibility to their production. It is possible for pre-existing genetic predisposition to be exacerbated by exposure to radiation and/or chemical carcinogens [12, 13].

In our case, the GIST, which is a sarcoma, occurred 10 years later in an area already irradiated for breast cancer and so, considering the nature of the cancer, its topography and the time it took to appear after irradiation, we were able to conclude that it was indeed a secondary cancer.

CONCLUSION

When disease control and survival rates are strong, as they are with early breast cancer, the long-term risk associated with cancer therapy becomes more significant. A growing proportion of patients who are at risk for radiation-induced sarcoma will receive therapy for breast cancer using conservative and multimodality techniques as a result of efficient screening. It is crucial to understand that radiotherapy is a successful treatment option and that its advantages are not outweighed by the slight variation in these incidence rates [14, 15].

Therefore, the purpose of the present paper is to draw attention to the occurrence of low-grade malignancy sarcomas after radiotherapy.

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