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Cancerous Mesenchymal Tumor as a Radiation Sarcoma

Stacey Miller*

Department of Cancer Science, Institute of Cancer Sciences, University of Glasgow, Glasgow, Scotland, UK

Abstract

Hereditary retinoblastoma and Li-Fraumeni syndrome, two rare genetic conditions, raise the likelihood of bone cancer in families. The disease that affects Paget's bones Paget's disease of the bone, which mostly affects the elderly, raises the risk of developing bone cancer in later life. The most common type of bone cancer is osteosarcoma. The cancerous cells in this tumor make bone. The bones of the arm or leg are most frequently affected by this kind of bone cancer in children and young adults. Osteosarcomas rarely spread beyond the bones.

Keywords: Bone sarcoma • Cancer • Tumor's cancerous cells • Chondrosarcoma

Introduction

Cartilage is made by the cancerous cells in this tumor. Middle-aged and older people are more likely to develop chondrosarcoma in their pelvis, legs, or arms. A child's risk of developing osteosarcoma is increased by familial retinoblastoma, an eye cancer. Osteosarcoma is more common in people who have Li-Fraumeni syndrome and other sarcomas in their family. An individual's risk of developing osteosarcoma is higher than that of the general population, according to research.

Description

A factor that increases your risk of developing a disease like cancer is known as a risk factor. Different kinds of cancer have different risk factors. Changing some risk factors, like smoking, is possible. Some things, like a person's age or their family history, cannot be changed. However, having just one or even a few risk factors does not guarantee that you will contract the disease. Some people with cancer have few or no known risk factors, but many people with one or more known risk factors never develop the disease. Primary bone malignancies, or cancers that start in the bones, can take many different forms. While they all share some characteristics, not all of them are at risk for the same conditions [1].

People who have had radiation therapy for other conditions are more likely to develop bone sarcoma at the radiation therapy site. It is a good idea to keep an eye out for any new symptoms in an area that had previously been treated with radiation, even if you were treated as an adult who was a child. Radiation-related bone sarcomas can appear many years, if not decades, after treatment, so it is a good idea to keep an eye out for those symptoms. Angiosarcoma, osteosarcoma, and soft tissue's undifferentiated pleomorphic sarcoma (UPS) are the most common sarcomas caused by radiation therapy, but other types can occur as well. Because early detection increases the likelihood of a successful treatment, people with known risk factors should visit their doctor frequently to examine their individual risk of developing bone sarcoma. Retinoblastoma, Li-Fraumeni syndrome, and other inherited sarcoma risk factors are all included in this category. For additional information regarding your individual cancer risk, consult your medical team. However, there are no known risk factors for the majority of people who develop bone sarcomas [2].

A rare cancerous mesenchymal tumor known as a radiation-associated sarcoma (RAS) occurs after radiation exposure, most frequently as a result of radiation therapy (RT) administered to treat another major oncologic condition. After radiation therapy (RT) for lymphoma, breast cancer, or gynecologic cancer, RAS frequently occurs. It accounts for between 3% and 6% of all sarcomas and can occur anywhere. RAS was one of the first solid cancers to be linked to exposure to ionizing radiation, with the first cases occurring in people who had received radiation therapy for benign bone disorders and watch dial painters using radium paint in the 1920s. There had been evidence of a link between radiation exposure and cancers in the population that had survived the bombings of World War II. Later, it was discovered that radiation was a precursor to cancer [3].

It has been demonstrated that radiation-associated osteosarcomas can develop as a result of radiotherapy for a variety of histologies, including the treatment of childhood leukemia, primary osteosarcoma, Ewing's sarcoma, synovial sarcoma, and a variety of carcinomas, including breast, uterine, bladder, nasopharyngeal, and thyroid cancer. In addition, there is evidence that radiation therapy for benign conditions, such as heterotopic ossification, which can be treated with doses as low as 7 Gy in a single portion, can result in secondary sarcomas. The recognition of the risk of subsequent cancer, particularly in younger patients with longer life expectancies is one reason why therapeutic radiation has evolved to treat mostly malignant diseases in recent decades [4].

Sarcoma development is affected by dose-related radiation exposure, as is genetic susceptibility. Familial gastrointestinal stromal tumor syndrome (GIST), Li-Fraumeni syndrome, retinoblastoma, Werner syndrome, Neurofibromatosis Type 1, Costello Syndrome, and Nijmegen breakage syndrome are a few of the uncommon familial genetic syndromes that increase the risk of bone or soft tissue sarcoma. The question of whether individuals with particular heritable disorders are more sensitive to the effects of ionizing radiation than the average person is intriguing, particularly in the context of high doses of radiotherapy [5].

Conclusion

Because it takes a lot of radiation to kill bone cancer cells, doctors often use specific radiation treatments to treat the disease. They are able to control the size and intensity of the radiation beams using these methods, delivering greater doses to the tumor while sparing the surrounding tissues. Although atomic protons cause little harm to the tissues they pass through, they only travel a short distance before releasing most of their energy. This is in contrast to x-rays, which have the same energy both before and after

***Address for Correspondence:** Stacey Miller, Department of Cancer Science, Institute of Cancer Sciences, University of Glasgow, Glasgow, Scotland, UK; E-mail: staceymiller@icr.ac.uk*

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reaching the tumor because they pass through healthy tissue. Because of this property of protons, medical professionals are able to apply greater radiation doses to the tumor while causing less harm to the healthy tissue that surrounds it.

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Conflict of Interest

None.

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