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Case Report

Cutaneous Vasculitis after Radiotherapy

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ABSTRACT

Cutaneous vasculitis is a large heterogeneous group of diseases, where blood vessels are targeted by immunological and inflammatory reactions, which are the primary causes of this condition. Infections, medications, systemic collagenosis, chronic diseases, and malignancies are the secondary factors that cause cutaneous vasculitis. Hemangiomas are the most common primary benign tumors of the spinal cordand are rarely symptomatic. The most commonly manifestedsymptom is pain, but in rare cases, cutaneous vasculitis may lead to paraparesis and paralysis. Radiotherapy (RT) is a safe and effective treatment for symptomatic spinal cord hemangiomas. A 44-year-old male patient was admitted to our dermatology polyclinic with a complaint of a bilateral rash on both legs that had lasted for 1 week. The medical history of the patient included no disease other than a sacral hemangioma with symptomatic pain, for which the patient had been treated with 4500 cGy curative radiotherapy 1 month previously. In our case, it was thought that cutaneous vasculitis was caused by the radiotherapy without any other triggering factor. A skin biopsy was taken to arrive at a definite diagnosis, and in the histopathological examination, abundant amounts of extra-red blood cells and lymphocytes were observed, along with endothelial profiling in superficial vessels; all of which are findings consistent with vasculitis. The patient was diagnosed with cutaneous vasculitis, both clinically and histopathologically. To the best of our knowledge, radiotherapy as a cause of vasculitis has been the subject of very few studies in the literature to date. In this regard, the present report describes a case of cutaneous vasculitis as a possible immune-related side effect of RT.

Keywords: Cutaneous vasculitis, hemangioma, radioimmunology, radiotherapy

INTRODUCTION

Vasculitis refers to the inflammation of blood vessels and may affect any part of the body (1). Deep small and medium sized blood vessels may be affected by either primary or secondary inflammation (1). Infections, medications, systemic collagenosis, chronic diseases, and malignancies are secondary causes of cutaneous vasculitis (1).

Hemangiomas are the most common primary benign tumors of the spinal cord, and are rarely symptomatic, with the most common symptom being pain, although in rare cases it may lead to paraparesis and paralysis (2). Radiotherapy is considered a safe and effective treatment method for symptomatic spinal cord hemangiomas (2).

To the best of our knowledge, cutaneous vasculitis following radiotherapy is an under-researched subject in literature. We present here a case of cutaneous vasculitis that describes the effects of radiotherapy administered for a sacral hemangioma.

CASE PRESENTATION

A 44-year-old male patient was admitted to the dermatology polyclinic with a complaint of a bilateral rash on both legs that had emerged 1 week earlier. A dermatologic examination revealed palpable purpura on both legs (Figure 1). The medical history of the patient included no disease other than a sacral hemangioma. The S1 and S2 sacral vertebrae were identified with expansive hemangiomas in an MRI (Figure 2). The patient had no history of drug use other than the occasional paracetamol for back pain, and the subject's family history was not characteristic for this condition.

The patient had been treated with 4500 cGy curative radiotherapy in 25 fractions, with 180 cGy per day, for a sacral hemangioma with symptomatic pain 1 month previously. In a laboratory review, the following measures were recorded; C3: 1.06 g/dL, C4: 0.234 g/dL, ANA: negative, anticardiolipin antibodies: negative. Other laboratory tests were found to be normal, and no autoimmune pathogenesis was detected in the patient. It was thought that cutaneous vasculitis was the cause of radiotherapy in our

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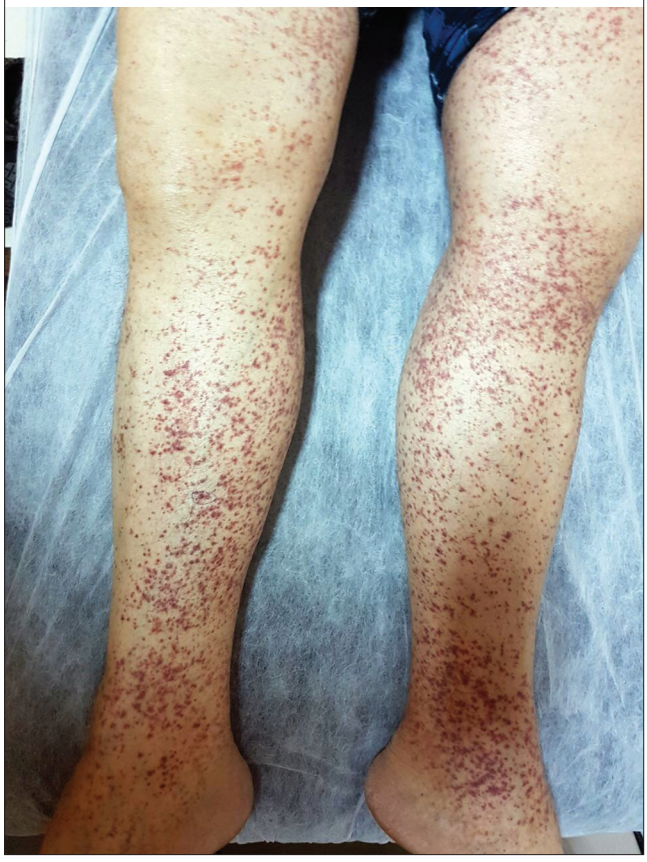
case without any other triggering factor. A skin biopsy was taken to make a definite diagnosis.

In the histopathological examination, abundant quantities of extra-red blood cells and lymphocytes were observed, along with endothelial profiling in superficial vessels, which was consistent with vasculitis (Figure 3). The direct immunofluorescence assay was negative, and the patient was diagnosed with cutaneous vasculitis, both clinically and histopathologically.

Figure 1. Palpable bilateral purpura on both legs



Treatment with 48 mg of oral prednisolone was begun and was gradually reduced in 2 months. The lesions of the affected lesion decreased in 2 months and there was no recurrence of skin lesions in the medical follow-up.

Informed consent was obtained from the patient for the publication of this case report and the associated images.

DISCUSSION

Cutaneous vasculitis can, in rare cases, develop through secondary malignancies (3), and is known as paraneoplastic vasculitis.

Figure 2. T1 MRI showing expansive hemangiomas in the S1 and S2 vertebrae

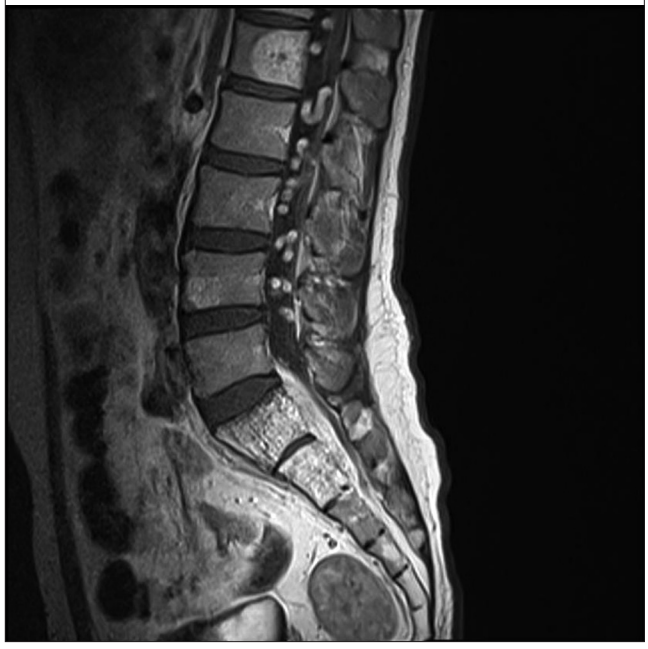
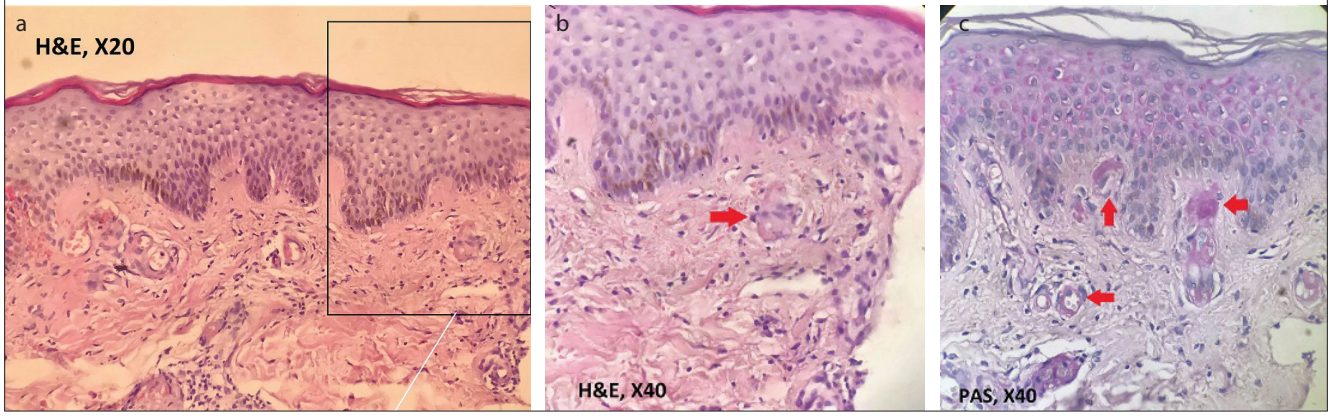


Figure 3. a-c. Histopathological examination showing abundant amounts of extra-red blood cells and lymphocytes, along with endothelial profiling in superficial vessels, all of which are consistent with vasculitis



The mechanism behind the development of paraneoplastic vasculitis is unknown, although it may cause tumor cells to act directly or indirectly as sensitizing agents, or to induce vascular damage to the cytokines that are secreted by the tumor (3). Although vasculitis is sometimes associated with malignancy, it is thought to appear incidentally in most cases (3). In our case, paraneoplastic vasculitis was not considered as the sacral hemangioma was a benign tumor.

Radiotherapy is used for a variety of oncologic conditions and radiation-induced changes to the skin are significant adverse effects of such therapies. Advances in technology and changes in therapeutic regimens have reduced the burden of the cutaneous side effects of radiotherapy (4).

Vertebral hemangiomas are indicated for treatment if the pain is severe and if there is a neurological deficit. In the previous literature, pain palliation was achieved in 82% of patients who underwent 36-40 Gy radiotherapy for a sacral hemangioma. Radiotherapy is a noninvasive, safe, and effective treatment option, although it is not known exactly which mechanism is effective in vertebral hemangiomas. Radiotherapy is thought to cause ischemic changes in segmental capillaries, and may, at the same time, affect the microvascular network. It also leads to a reduction in pain as a result of its anti-inflammatory effects (5). In the present case, radiotherapy was chosen as the treatment method for reasons of safety.

Radiotherapy may cause harm to Langerhans cells, basal cells, and vascular endothelium (6), and these cells have also been found to start an inflammatory cascade and ischemia-reperfusion damage (7). The inflammatory answer to radiation arises mainly from a proinflammatory cytokine cascade (IL-1, IL-3, IL-5, IL-6, TNF-a), chemokines (IL-8, eotaxin, CCR receptor), receptor tyrosine kinase, and adhesions molecules (ICAM-1, VCAM, E-selectin). These factors compose a reaction of eosinophils and neutrophils, leading to self-perpetuating tissue injury and a loss of preventive factors (8).

Until now, the use of radiotherapy in the treatment of cancer has been based on its high potential to induce tumor cell death and to halt the survival of clonogenic tumor cells. In recent years, the increasingly frequent emphasis has been placed on the immunological effects of radiotherapy, which has been well detailed by Vatner et al. (9) in the field of radioimmunotherapy. Although the effects of irradiation on the human immune system are clear, the diversity of the organ and cellular components of the immune system, their complex interactions, and the patterns of cellular migration have made the exact characterization of these abnormalities difficult (9). Vascular injury due to radiation is an uncommon side effect of radiation therapy, although it has been identified in many major vessels, including the aortic, renal, iliac, carotid, and subclavian-axillary arteries (10). To date, however, cutaneous vasculitis associated with radiation therapy has never been mentioned in literature. In our opinion, radiotherapy may bring on vasculitis by bringing about ischemic changes and immunity in capillary vessels.

CONCLUSION

To the best of our knowledge, there has been no research investigating vasculitis as a result of radiotherapy in the literature. Aiming to fill this gap, this research draws attention to cutaneous vasculitis as a possible immune-related side effect of radiotherapy.

Informed Consent: Written informed consent was obtained from the patient for the publication of this case report and the associated images.

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