Acquired immune deficiency syndrome-related epidemic Kaposi sarcoma

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Abstract

Kaposi sarcoma (KS) is a vascular neoplasm that is one of the most common human immunodeficiency virus (HIV)-related malignancies. We present the case of a 42-year-old man with a new diagnosis of HIV and acquired immune deficiency syndrome (AIDS)-related epidemic KS.

Keywords: Kaposi sarcoma, human immunodeficiency virus, HIV, AIDS

Introduction

KS was first described by Moritz Kaposi in 1872 and has emerged as one of the most common HIV-related malignancies. KS presents as violaceous, erythematous, blue, grey, or black macules, patches, plaques, and nodules and may involve lymph nodes and internal organs such as the lungs and gastrointestinal tract. Although history and physical examination may be highly suggestive of a diagnosis of KS, histopathology evaluation is required to confirm the diagnosis. Control of HIV with antiretrovirals often decreases, and may even eliminate, tumor burden in acquired immunodeficiency syndrome (AIDS)-related epidemic KS. Other therapies range from local approaches such as surgical excision and liquid nitrogen to radiation therapy and cytotoxic chemotherapy.

Case synopsis

A 42-year-old man who has sex with men was seen by the dermatology inpatient consultation team at NYU Langone Tisch Hospital for non-blanching erythematous to violaceous papules and plaques on the bilateral feet and ankles for six years. This eruption had previously been treated as psoriasis and continued to progress over time. The patient was admitted to the hospital with fever, fatigue, night sweats that had been progressive over several months prior to admission. In addition, the patient had experienced several episodes of sore throat symptoms with dry cough as well as an approximately 30-pound weight loss over the months prior to admission. Complete evaluation was

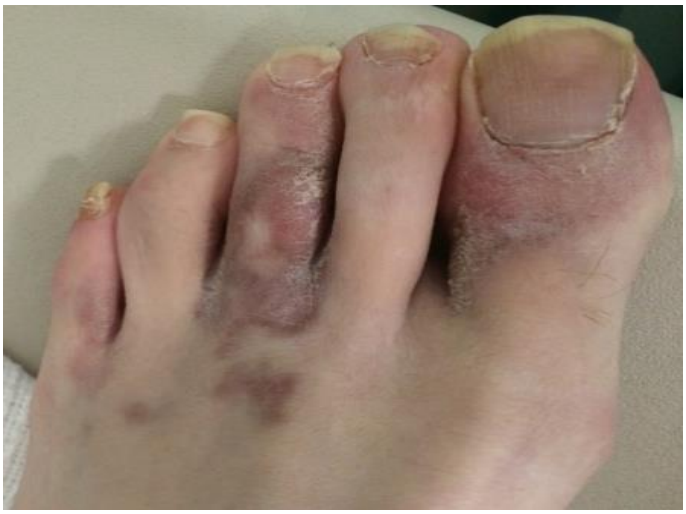

Figure 1. *Purpuric plaques on dorsal foot.*

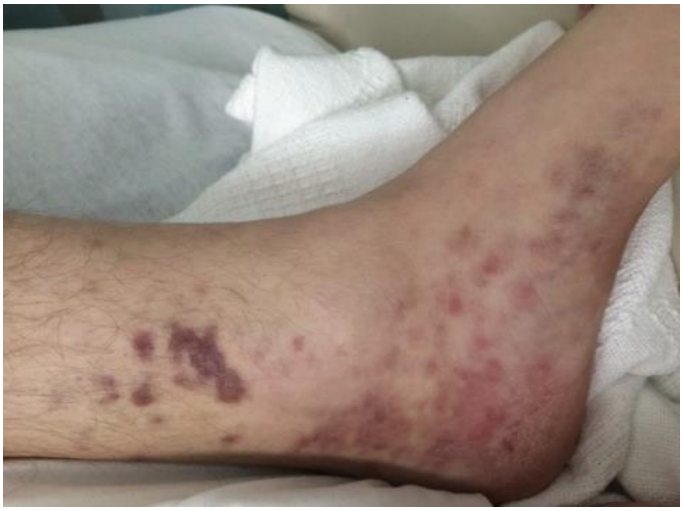

Figure 2. *Purpuric plaques extend onto plantar surfaces.*

consistent with *Pneumocystis jirovecii* pneumonia. A dermatology consultation was requested for evaluation of the lower leg eruption.

On the ankles, there were erythematous-to-violaceous, non-blanching macules and plaques. There was a thin, purpuric plaque with fine scale on the dorsal aspect of his left foot (**Figure 1**). There were also thin, purpuric plaques with fine scale on his plantar feet (**Figure 2**).

A complete blood count revealed pancytopenia with a white blood cell count of 3900 cells/microliter, a hemoglobin of 11.3 grams/deciliter, a hematocrit of 34.4%, and a platelet count of 61000 cells/microliter. A white blood cell differential revealed a neutrophilia to 89% with low lymphocytes (5%), monocytes (3%), and 3% atypical lymphocytes. A basic metabolic panel was normal, and a hepatic panel showed an aspartate aminotransferase (AST) of 88 units/liter and an alanine aminotransferase (ALT) of 79 units/liter. Activated thromboplastin time, prothrombin time, and international normalized ratio were within normal limits. An HIV polymerase chain reaction study revealed an HIV-1 RNA of 766,987 copies/ml. T cell subset studies showed a CD4 count of 22 cells/ml. Serological studies for hepatitis B and C were negative.

A punch biopsy was obtained from a violaceous plaque on the medial aspect of his left lower leg. There was a proliferation of jagged blood vessels within the dermis around pre-existing vascular plexuses and adnexae (**Figure 3**). An immunoperoxidase study for HHV-8 was positive (**Figure 4**).

The patient was treated for his *Pneumocystis jirovecii* pneumonia and was discharged from the hospital. He was started on elvitegravir/cobicistat/emtricitabine/tenofovir alafenamide daily. He was also referred to the oncology department for consultation. He had negative venous duplex ultrasounds of the lower extremities and will be having an abdominal CT scan to ensure that there is no intra-abdominal disease. Response to ART will be assessed and if his KS does not improve, additional KS-directed therapy may be considered.

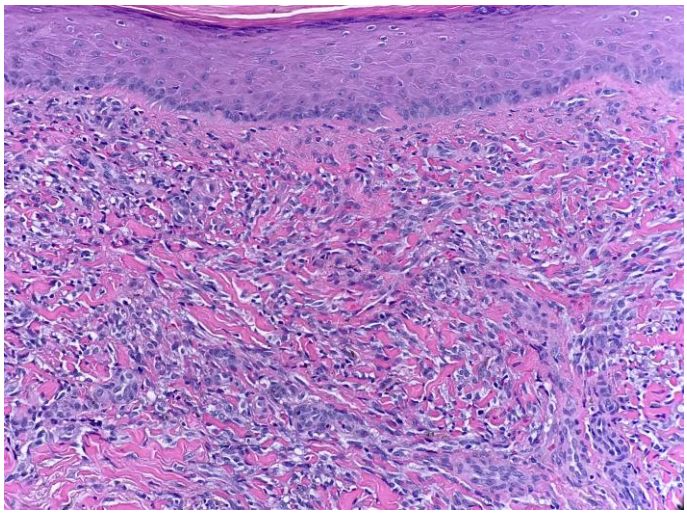

Figure 3. *Proliferation of jagged blood vessels within the dermis around pre-existing vascular plexuses and adnexae. H&E, 20×.*

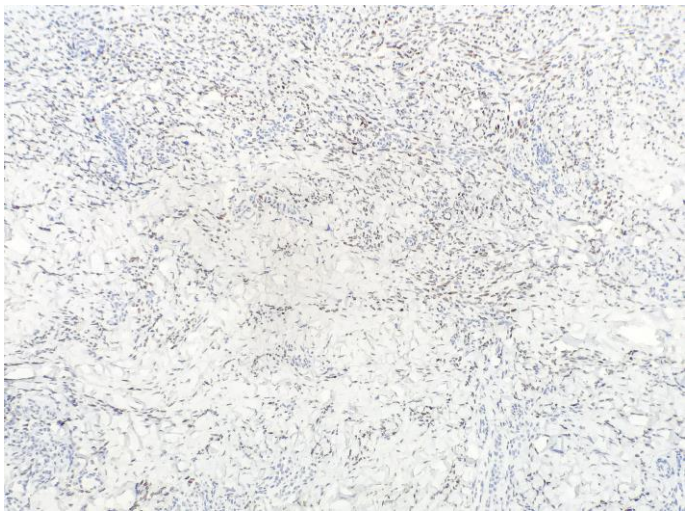

Figure 4. *Immunoperoxidase study for HHV-8 showed positivity, 20×.*

Discussion

Kaposi sarcoma (KS) is a vascular neoplasm that was first described in 1872 by Moritz Kaposi [1]. Kaposi sarcoma, initially observed in elderly males of Eastern European and Mediterranean descent, was described in patients with HIV in 1981 and has been coined AIDS-related epidemic Kaposi sarcoma [1-4]. Kaposi sarcoma is caused by an infection with human herpesvirus 8 (HHV-8), which is also known as the Kaposi sarcoma-associated herpes virus [1, 3, 5]. Clinically, the presentation of KS can be variable with violaceous, erythematous, blue, grey, or black macules, patches, plaques, and nodules. Lesions may bleed or ulcerate and can be found on the skin and mucous membranes. KS can also involve lymph nodes and visceral organs. The lungs and gastrointestinal tract are the most commonly affected visceral organs [6].

The diagnosis of KS can often be established with a history and physical examination, but histopathology evaluation is required to confirm the diagnosis. Microscopically, KS demonstrates a proliferation of spindle cells and blood vessels [5]. Proliferating blood vessels may be seen surrounding existing blood vessels [5]. In well-developed KS, fascicles of spindle cells and blood vessels can be seen [5]. Often, an inflammatory infiltrate is also present with plasma cells, lymphocytes, and dendritic cells. CD34 and HHV8 immunohisto-chemical staining is positive in KS [5]. Given that AIDS-related epidemic KS can often be multifocal, computed tomography (CT) imaging for staging is often helpful [7, 8].

Treatment of KS is largely dependent upon the location, extent, and pace of disease; the latter two are influenced in part by the immune state of the affected patient. Typically, the disease is multifocal and recurs despite treatment [3]. AIDS-related KS differs in treatment from other epidemiological forms of KS. In AIDS-related KS, the primary treatment is immune reconstitution and HIV suppression [1]. Initiation of antiretroviral therapy (ART) and subsequent rise in CD4 count results in a decrease in tumor burden, as the immune system is able to adequately suppress the HHV8 virus [1, 2]. Use of ART for KS in AIDS patients has been demonstrated to halt progression, decrease tumor burden, and decrease HHV8 viral load [3]. A subset of AIDS patients; however, may experience progression of KS following initiation of ART related to an immune reconstitution inflammatory syndrome [1, 2]. Discontinuation of ART is not necessary for these patients, but adjuvant chemotherapy may be required to control the tumor burden [2]. AIDS-related KS responds to other therapies such as chemotherapy and radiation therapy (RT), but the responses to both tend to be less durable when compared to other epidemiologic forms of KS [3].

Local treatment may be indicated for single lesions or local recurrences. Often, symptomatic single lesions may be surgically excised [9]. Less invasive topical treatments may also be utilized for limited disease. Cryotherapy has been found to be an effective therapy with a high rate of lesion clearance and low recurrence rate [10]. Alitretinoin 0.1% gel and imiquimod 5% cream have both been used to treat KS topically [11-13]. The disadvantage of all local therapies is that KS lesions can still develop in untreated areas.

Antiretroviral therapy and systemic chemotherapy are treatment options for disease extending beyond limited cutaneous or visceral lesions. All forms of KS are sensitive to RT; however, there is a tendency for non-irradiated areas to develop lesions. Antiretroviral therapy has been shown to yield symptom relief, tumor shrinkage, and even clearance [9]. Indications for systemic chemotherapy include widespread skin involvement, extensive oral or mucocutaneous KS, marked symptomatic edema, rapidly progressive disease, symptomatic visceral KS, and KS flare [5]. Liposomal anthracyclines and taxanes are the main chemotherapy types used to treat KS [5]. Doxorubicin, particularly in liposomal formulations to minimize systemic toxicity, and daunorubicin are effective in 60-80% of patients [1]. Paclitaxel is considered a second-line option and is generally used when doxorubicin is not available [1]. All these regimens appear to perform comparably in combination with ART in HIV infected individuals [14].

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