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Dermatological Lesions of Cholesterol Embolization Syndrome and Kaposi Sarcoma Mimic Primary Systemic Vasculitis

Case Report Study

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Abstract

Primary systemic vasculitis can present with a wide spectrum of manifestations ranging from systemic non-specific features such as fever, malaise, arthralgia, and myalgia to specific organ damage. We describe two cases of cholesterol embolization syndrome and Kaposi sarcoma mimicking primary systemic vasculitis, both of which were characterized by features such as livedo reticularis, blue toe syndrome, a brown, purpuric skin rash, and positive p-ANCA associated with Kaposi sarcoma. Establishing the right diagnosis was challenging, and thus we aim in this study to highlight the possible ways to distinguish them from primary systemic vasculitis.

Keywords: Dermatological lesions, Cholesterol embolization syndrome, Kaposi sarcoma, vasculitis mimic

Introduction

Vasculitis is an inflammatory process affecting the blood vessels, causing destruction that leads to ischemia, hemorrhage, or both (1). It has a wide spectrum of manifestations ranging from systemic non-specific features such as fever and a loss of appetite or weight to specific organ damage such as kidney and/or cutaneous damage manifested by purpura nodules, purpuric urticaria, livedo reticularis, and skin ulcers (2,3). Thus, non-specific diverse manifestations can be mistaken for other conditions. We report two cases of the rare presentation of cholesterol embolization syndrome (CES) and Kaposi sarcoma (KS) mimicking vasculitis. We aim to prompt their recognition and distinguish them from vasculitis.

Case presentation

Case One

A 65-year-old man, a known case of triple coronary artery vessel disease based on a coronary angiogram performed a week before, presented to our hospital with abdominal pain and vomiting for a day. Physical examination revealed a skin rash, livedo reticularis, and the blue discoloration of the toes, which suggested blue toe syndrome **(Figure 1)**. All other physical examinations were unremarkable.

The patient was admitted, and laboratory investigations showed the following results: white blood cell count of 14/mm^3 with neutrophiles 53%, eosinophile 9%, and lymphocytes 32%; hemoglobin 11.1 g/dL; platelets 144 × 10^3/mm^3; erythrocyte sedimentation rate 32 mm/h; C-reactive protein 35 mg/L; creatinine 2.4 mg/dL; and urea 43 mg/dL; aspartate aminotransferase 36 U/L (normal range, 10–41 U/L); alanine aminotransferase 31 U/L (normal range,10–40 U/L); total cholesterol 209 mg/dL; high-density lipoprotein 42 mg/dL; low-density lipoprotein 138 mg/dL; triglyceride 140 mg/dL; serum iron 64lg/dL (normal range, 50–140 lg/dL); serum ferritin 138 ng/ml (normal range, 15–300 ng/ml); transferrin iron binding capacity 238 lg/dL (normal range, 130–350 lg/dl). The urinary protein level was 600 mg/dL and the microscopic urinary examination was negative for cells and casts. Serological testing for anti-nuclear antibodies, anti-neutrophil cytoplasmic antibodies, hepatitis C virus, and hepatitis B surface antigen all were negative.

On abdominal ultrasound, both kidneys were within normal size with no other remarkable findings. Transthoracic echocardiography showed the left ventricle normal in size with an ejection fraction of 57%, no intramural thrombus, or any evidence of infective endocarditis. Multiple biopsies of the affected skin and kidney were arranged but, unfortunately, were refused by the patient.

Case Two

An 86-year-old woman presented with intermittent fever, dyspnea, a dry cough, and a loss of weight for two months. Physical examination revealed a bilateral brown/purple ill-demarcated plaque over the tibia and dorsum of the feet **(Figure 2)**. Laboratory investigation revealed mild thrombocytopenia ($124\times10^3/mm^3$), anemia (10.6 g/dL), high erythrocyte sedimentation rate (55 mm/h), and high C-reactive protein (42 mg/L); serological testing was positive for perinuclear anti-neutrophil cytoplasmic antibodies (p-ANCA), and enzyme-linked immunoassay testing revealed positive anti-myeloperoxidase with a titre of 512 AAU/ml (normal: 0-150 AAU/ml), and negative for anti-proteinase 3. All other investigations were within the normal range including coagulation profile, renal function, and HBV and HCV testing. Multiple biopsies of lesions were taken and these showed areas of hemorrhage, a vague network of connecting channels, and positive human herpesvirus-8 on immunohistostaining **(Figure 3)**, which is consistent with KS. Human immunodeficiency virus testing was carried out and was negative.

Declaration of patient consent

The authors certify that they obtained all appropriate patient consent forms. In the form, patients provided consent for their images and other clinical information to be reported in the journal. They understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Discussion

Multiple conditions can injure or occlude the blood vessels and mimic the clinical picture of vasculitis. The location and size of the affected vessel determine the clinical manifestations of the vascular injury more than the underlying cause. For example, damage to small cutaneous vessels is manifested by palpable purpura, urticaria, livedo reticularis, papulovesicular lesions,

and nodules. Similarly, damage can arise in the heart, kidney, gastrointestinal tract, and brain (4). These diseases are not necessarily associated with blood wall inflammation. However, they might have the same findings of vasculitis in clinical, laboratory, radiographic and/or pathologic settings, which leads to diagnostic confusion (5).

CES is a great mimic, which makes it confusing for the diagnosis of vasculitis. A purpuric rash, livedo reticularis, myalgia, and acute renal failure are some of the symptoms that can occur. Cholesterol emboli can complicate cardiac catheterization and arteriography; moreover, this can happen spontaneously, even in individuals who have never suffered previous vascular disease (6). In our first case, the patient developed manifestations that mimic the typical features of Churg–Strauss vasculitis such as livedo reticularis, purpura, skin ulceration, and infarction and eosinophilia (6).

Moreover, renal failure can be found in both syndromes. While this can mask diagnosis, multiple biopsies of affected sites (skin, kidney, and muscle) can identify the characteristics of CES, namely, occluded small arteries and arterioles characterized by a lance-shaped cleft (dissolution of cholesterol crystals) (7). Unfortunately, our patient refused the biopsy and the diagnosis was made based on clinical pictures.

The other case is KS mimicking vasculitis at the time of presentation. KS is a malignant tumor that affects immunocompromised patients such as those infected with HIV, those who receive immunosuppressants drugs, and those with congenital causes (8). KS skin lesions manifest as red, purple, and brownish patches and dots, which can be misidentified as malignant or vascular lesions in some phases due to the rise in superficial vascularity (9).

p-ANCA, an important marker for ANCA-associated vasculitis, has been found to be 91% specific (10). The clinical pictures of a brown, purpuric rash on the lower limbs, as in our case, in addition to positive p-ANCA are highly suggestive of vasculitis. A previously reported case of KS and positive p-ANCA was due to existing vasculitis (11). In fact, the patient developed KS after receiving an immunosuppression agent to treat vasculitis. But our case is unique in that p-ANCA was positive at the time of presentation with no existent vasculitis. However, the

possibility of incidental finding or our patient could develop vasculitis later is possible. To the best of our knowledge, there are no reported cases in the literature of KS associated with positive p-ANCA with no existing vasculitis. Further studies, which take these variables into account, will need to be undertaken.

Conclusion

Many conditions can mimic the clinical and laboratory features of vasculitis. Herein, we present two cases of CES and KS as mimics that might delay the correct diagnosis. However, a previous history of angiography catheterization and biopsy would cut doubt with certainty. This study aims to raise awareness of the possible differential diagnoses of vasculitis. Further studies are needed to investigate the relation between positive p-ANCA in patients and KS.

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Authors' Contribution

ASA is responsible for the majority of the work. AMAm drafted the manuscript and handled the designing and formatting. WAA and AMAh collected the clinical information and wrote the initial manuscript. AmAA provided the histopathology results. AMAm formulated the abstract. MHA, AM, and AbAA were the treating physicians. All authors approved the final version of the manuscript.

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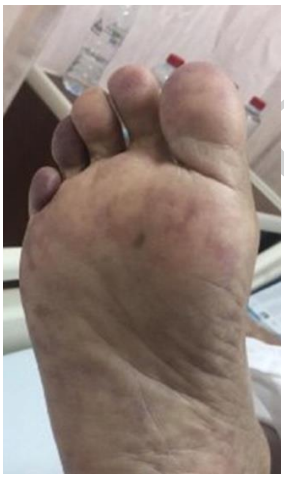

Figure 1: the dermatological findings at presentation in case 1

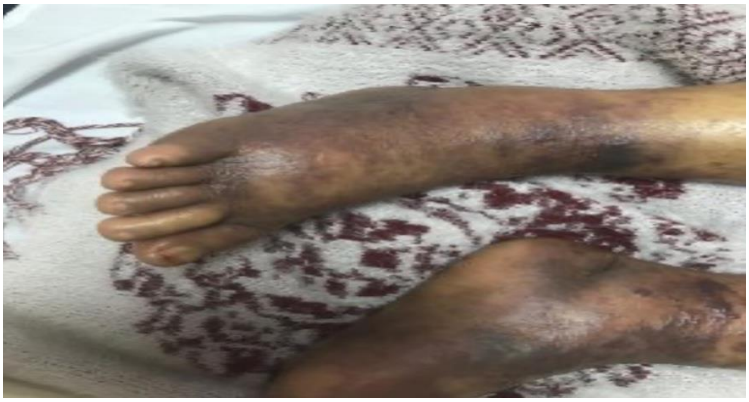

Figure 2: the dermatological findings at presentation in case 2.

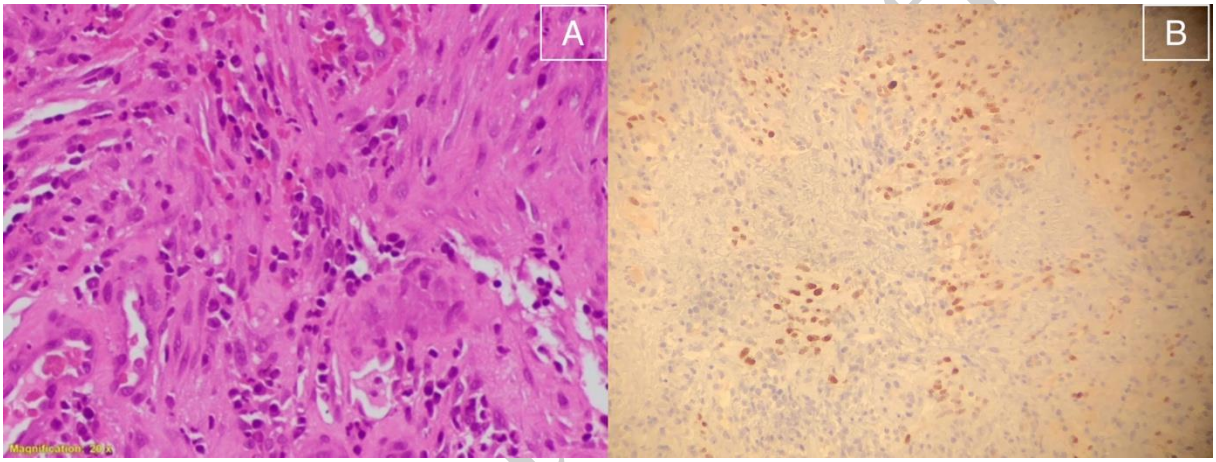

Figure 3: A: shows areas of hemorrhage and vague network of connecting channels, dilated channels lined by small hyperchromatic nuclei **B:** HHV-8 immunohistostaining shows positive granular nuclear staining