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CASE REPORT

Dermatological Lesions of Cholesterol Embolisation 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 embolisation syndrome and Kaposi sarcoma mimicking primary systemic vasculitis, both of which were characterised by features such as *livedo reticularis*, blue toe syndrome, a brown purpuric skin rash and positive perinuclear anti-neutrophil cytoplasmic antibodies associated with Kaposi sarcoma. Establishing the right diagnosis was challenging and thus this report aimed to highlight the possible ways to distinguish them from primary systemic vasculitis.

Keywords: Livedoid Vasculopathy; Cholesterol Embolisms; Blue Toe Syndrome; Kaposi Sarcoma; Cutaneous Vasculitis; Case Report; Saudi Arabia.

Vasculitis is an inflammatory process affecting the blood vessels, causing destruction that leads to ischaemia, haemorrhage 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 embolisation syndrome (CES) and Kaposi sarcoma (KS) mimicking vasculitis. We aim to prompt their recognition and distinguish them from vasculitis.

Case one

A 65-year-old male patient, a known case of triple coronary artery vessel disease based on a coronary angiogram performed a week before, presented to the authors' hospital in 2021 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 all laboratory investigations were within the normal range except the following results: white blood cell count of 14/mm^3 with neutrophils at 53%, eosinophil at 9% and lymphocytes at 32%; haemoglobin at 11.1 g/dL; platelets at 144 × 10^3/mm^3; erythrocyte sedimentation rate at 32 mm/hr; C-reactive protein at 35 mg/L; creatinine at 2.4 mg/d; urea at 43 mg/dL; and low-density lipoprotein at 138 mg/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 (HCV) 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; however, the patient unfortunately refused.

Case two

An 86-year-old female patient presented with intermittent fever, dyspnea, a dry cough and 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 × 10^3/mm^3), anaemia (10.6 g/dL), high erythrocyte sedimentation rate (55 mm/h) and high C-reactive protein (42 mg/L). Serological testing was positive for

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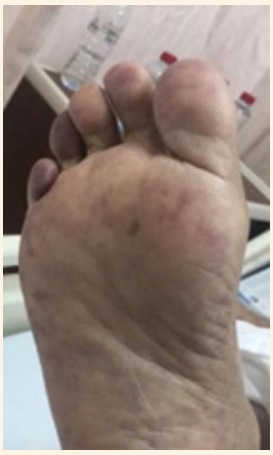

Figure 1: The dermatological findings at presentation in case one.

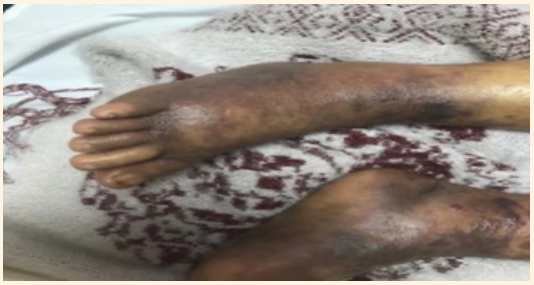

Figure 2: The dermatological findings at presentation in case two.

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 as well as hepatitis B virus and HCV testing. Multiple biopsies of lesions were taken and showed areas of haemorrhage, a vague network of connecting channels and positive human herpesvirus-8 on immunohistostaining, which is consistent with KS [Figure 3]. Human immunodeficiency virus testing was carried out and was negative.

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 for publication. 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 catheterisation and arteriography; moreover, this can happen spontaneously, even in individuals who have never suffered previous vascular disease.[6] In the first case, the patient developed manifestations that mimic the typical features of Churg–Strauss vasculitis such as *livedo reticularis*, purpura, skin ulceration, 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 characterised by a lance-shaped cleft (dissolution of cholesterol crystals).[7]

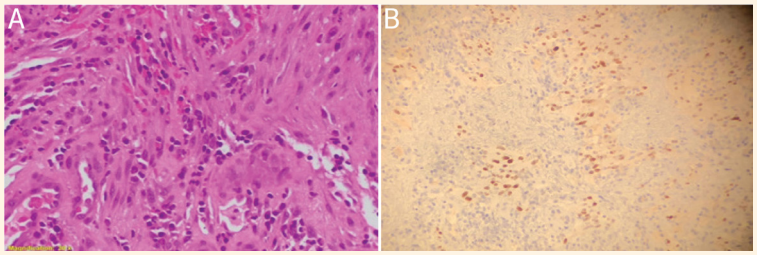

Figure 3: A: Microscopic image at ×20 magnification showing areas of haemorrhage and vague network of connecting channels, dilated channels lined by small hyperchromatic nuclei. **B:** Human herpes virus-8 immunohistostaining at ×10 magnification showing positive granular nuclear staining.

Unfortunately, the 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 tumour that affects immunocompromised patients such as those infected with human immunodeficiency virus, those who receive immunosuppressants 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]

An important marker for ANCA-associated vasculitis, p-ANCA, has been found to be 91% specific.[10] The clinical pictures of a brown, purpuric rash on the lower limbs, as in the current 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. However, the current case is unique in that p-ANCA was positive at the time of presentation with no existent vasculitis. However, there is the possibility of incidental finding or that the patient could develop vasculitis later. To the best of the authors' knowledge, there are no reported cases in the literature of KS associated with positive p-ANCA without 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 catheterisation and biopsy would cut doubt with certainty. This report aimed 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.

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 drafted 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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References

1. Chen KR, Carlson JA. Clinical approach to cutaneous vasculitis. Am J Clin Dermatol 2008; 9:71–92. https://doi.org/10.2165/00128071-200809020-00001.
2. Shavit E, Alavi A, Sibbald RG. Vasculitis—What Do We Have to Know? A Review of Literature. Int J Low Extrem Wounds 2018; 17:218–26. https://doi.org/10.1177/1534734618804982.
3. Mishra A, Iyadurai R, George A, Rajdurai E, Surekha V. Etiological and clinicopathological study of secondary small vessel vasculitis in elderly: A case series of 12 patients. J Fam Med Prim Care 2017; 6:106. https://doi.org/10.4103/2249-4863.214977.
4. Sack KE. The difficulties of differentiating vasculitis from its mimics. Cleve Clin J Med 1998; 65:550–2. https://doi.org/10.3949/ccjm.65.10.550.
5. Molloy ES, Langford CA. Vasculitis mimics. Curr Opin Rheumatol 2008; 20:29–34. https://doi.org/10.1097/BOR.0b013e3282f1dcf2.
6. Fegan CD. Lesson of the Week: Any Questions. BMJ 1995; 310:580. https://doi.org/10.1136/bmj.310.6979.580.
7. Maningding E, Kermani TA. Mimics of vasculitis. Rheumatol (Oxford) 2021; 60:34–47. https://doi.org/10.1093/rheumatology/keaa495.
8. Vangipuram R, Tyring SK. Epidemiology of Kaposi sarcoma: Review and description of the nonepidemic variant. Int J Dermatol 2019; 58:538–42. https://doi.org/10.1111/ijd.14080.
9. Marušić Z, Billings SD. Histopathology of Spindle Cell Vascular Tumors. Surg Pathol Clin 2017; 10:345–66. https://doi.org/10.1016/j.path.2017.01.006.
10. Guchelaar NAD, Waling MM, Adhin AA, van Daele PLA, Schreurs MWJ, Rombach SM. The value of anti-neutrophil cytoplasmic antibodies (ANCA) testing for the diagnosis of ANCA-associated vasculitis, a systematic review and meta-analysis. Autoimmun Rev 2021; 20:102716. https://doi.org/10.1016/j.autrev.2020.102716.
11. Fatma LB, Rais L, Mebazza A, Azzouz H, Beji S, Krid M, et al. Kaposis Sarcoma with HHV8 Infection and ANCA-Associated Vasculitis in a Hemodialysis Patient. Saudi J Kidney Dis Transplant 2013; 24:1199–202. https://doi.org/10.4103/1319-2442.121285.