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CASE REPORT

Do Not Forget the Oncovascular: Acute Limb Ischaemia Due to Aortic Epithelioid Angiosarcoma

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Introduction: Aortic epithelioid angiosarcoma (AEA) is a rare malignant tumour and can cause acute limb ischaemia.
Report: A 66 year old man was admitted with acute pulmonary oedema due to bilateral renal artery stenosis. An incidental osteolytic left sacral lesion was found on computed tomography angiography, and extensive work up revealed an AEA. Follow up was marked by acute left lower limb ischaemia 13 months later and right chronic limb threatening ischaemia 15 months later.
Discussion: Physicians need to consider AEA as an aetiology for acute or chronic limb ischaemia in patients with altered general status but mostly with intra-aortic irregular vegetations without any calcification and parietal involvement on computed tomography angiography.

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INTRODUCTION

Aortic epithelioid angiosarcoma (AEA) is a rare malignant tumour mostly developed from aortic endothelial cells and less frequently from medial and adventitial cells.[1] It is believed that <200 cases have been reported in the literature, with unspecific clinical presentations explaining their often delayed diagnosis.[1,2] This case is of a 66 year old man with a history of AEA admitted with lower limb embolisation. This report of oncovascular disease highlights a very rare cause of lower limb ischaemia.

CASE REPORT

A 66 year old man was admitted with acute pulmonary oedema due to bilateral renal artery stenosis in August 2021. An incidental 47 mm osteolytic left sacral lesion was found on abdominal and pelvic computed tomography angiography (CTA). Positron emission tomography computed tomography (PET-CT) was performed and identified a pathological hyperfixation of the left iliac wing and sacrum, and also of the intraluminal portion of the abdominal aorta and inter-aortocaval lymph nodes (Fig. 1). The full work up included cardiac magnetic resonance angiography (MRA) and aortic CTA, which identified 50% infrarenal abdominal aortic stenosis (Fig. 1).

In December 2021, histology performed on a sacral lesion biopsy revealed a poorly differentiated aortic epithelioid angiosarcoma. The patient underwent chemotherapy, including three cycles of doxorubicin followed by four cycles of paclitaxel starting from January 2022. Six months later, he presented with a pathological left per-trochanteric fracture leading to a month long hospitalisation, which interrupted the chemotherapy treatment.

In September 2022, he developed acute left lower limb ischaemia (ALI) 48 hours prior to attending the emergency department. Clinical examination showed a painful, cold, and pale left foot with sensory deficit in the toes; none of the left lower limb pulses were present. A CTA was performed and showed pre-occlusive stenosis of the infrarenal aorta, as well as occlusions of the left external iliac and left popliteal arteries (Fig. 2). The patient underwent an emergency 7 mm expanded polytetrafluoroethylene (ePTFE) prosthetic left axillofemoral bypass and left popliteal artery recanalisation and stenting. During the procedure, thrombotic material was found in the left common femoral artery. Anatomopathological study of the thrombus concluded the presence of rare and poorly differentiated tumour cells similar to the results of the previous biopsy (Fig. 3). Ischaemic symptoms resolved after the procedure. He was discharged after three days with long term anticoagulation (i.e., a low molecular weight heparin such as tinzaparin).

Two months later, the patient complained of worsening rest pain of the right lower limb associated with a right

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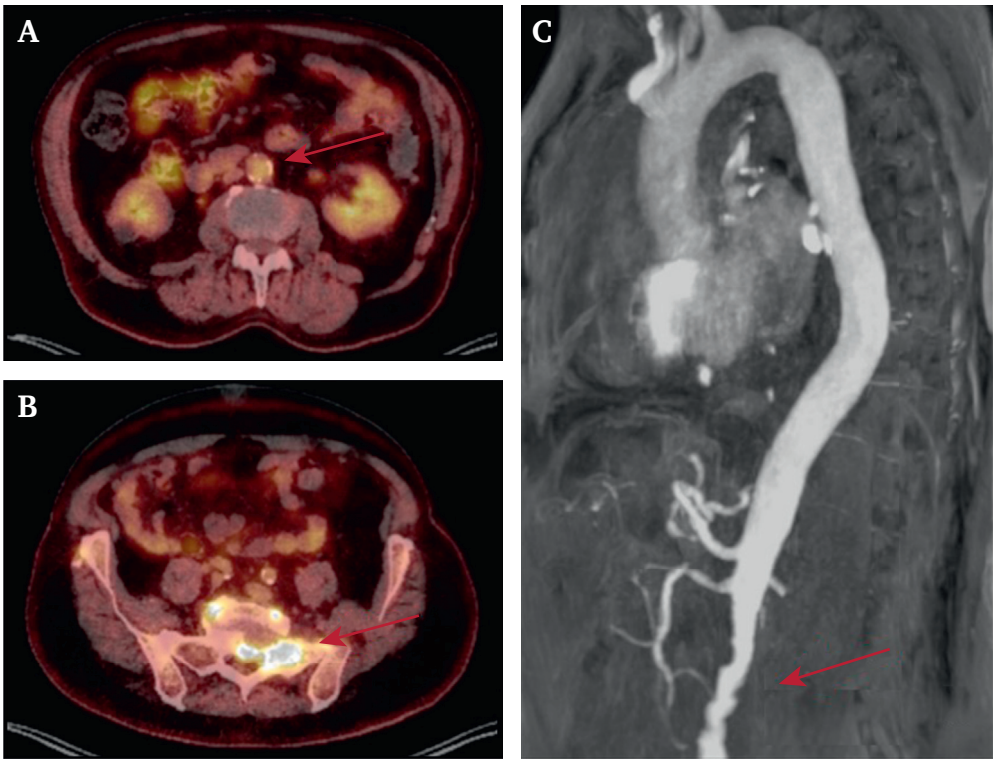

Figure 1. Computed positron emission tomography and magnetic resonance imaging angiogram images. **(A)** Axial view of pathological hyperfixation of the intraluminal abdominal aorta (red arrow). **(B)** Pathological hyperfixation of the sacral bone lesion (red arrow). **(C)** Sagittal view of a 50% stenosis of the infrarenal abdominal aorta (red arrow).

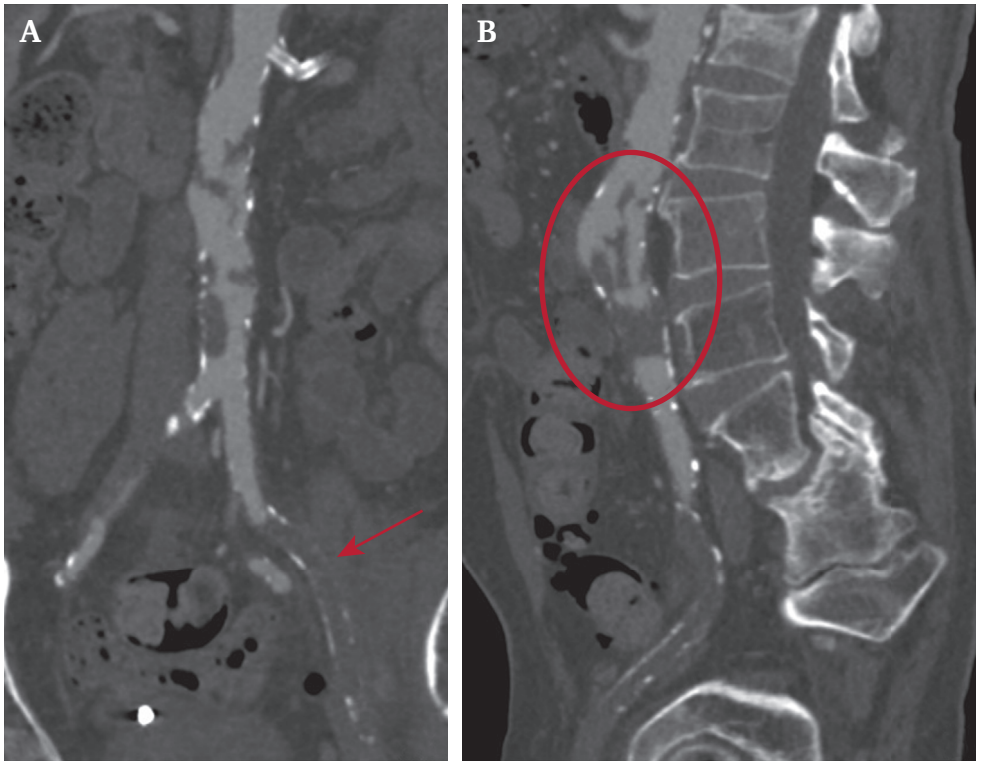

Figure 2. Computed tomography angiograms of the aortic angiosarcoma. **(A)** Frontal view of the aortic angiosarcoma. The red arrow shows occlusion of the left external iliac artery causing acute limb ischaemia. **(B)** Sagittal view of the aortic angiosarcoma highlighted in the red circle. Note the multiple intraluminal vegetations.

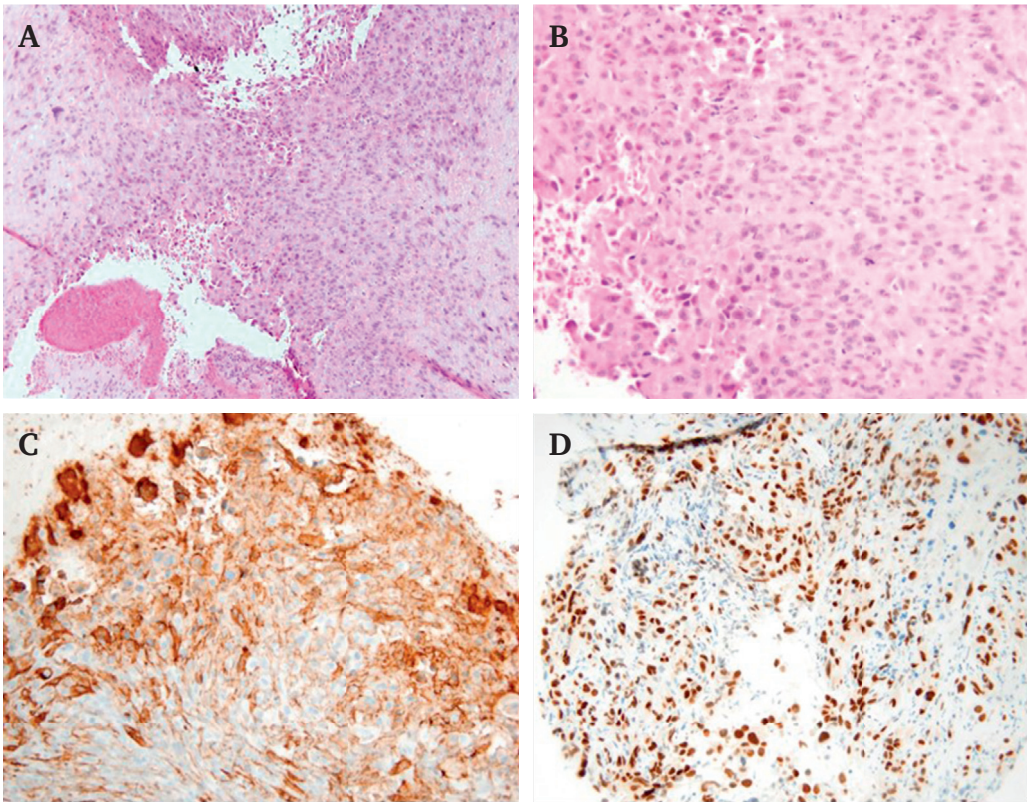

Figure 3. Pathology slides showing poorly differentiated proliferation of atypical epithelioid cells **(A)** HEx10 and **(B)** HEx20; and expression of vascular markers by immunohistochemistry: **(C)** CD31 and **(D)** ERG.

hallux punctiform necrotic ulcer. Clinical examination found right critical limb threatening ischaemia (CLTI). Doppler ultrasound showed occlusion of the right external iliac, superficial femoral, and popliteal arteries. A crossover femorofemoral 7 mm ePTFE prosthetic bypass and a right common femoral artery endarterectomy were performed. After the procedure, the patient did not show any ischaemic symptoms. Chemotherapy treatment was not resumed due to the frail general state of the patient and palliative care was installed. He died in March 2023, 15 months after initial diagnosis.

DISCUSSION

Aortic epithelioid angiosarcoma was diagnosed in a 66 year old man presenting with severe acute pulmonary oedema and was later responsible for ALI. Abdominal AEA is a very rare malignant tumour, poorly described, and frequently misdiagnosed. This case report highlights the diagnosis of this rare condition for educational purposes.

Aortic epithelioid angiosarcoma represents 4% of all sarcomas[1,3] and the mean age of diagnosis is 60 years, with a male predominance (sex ratio 2:1).[2,4] Less than 200 cases have been reported in the literature because of its low annual incidence of <1 case/million[1] and non-specific symptoms making the diagnosis difficult.

The most common symptoms are ALI secondary to peripheral AEA material embolisation, CLTI due to progressive arterial obliteration, aneurysm development, and aortic dissection.[1,2,4,5] This common atherosclerotic manifestation explains the delayed diagnosis of oncovascular disease. Aortic epithelioid angiosarcoma can also be diagnosed after the onset of a bone, lung, liver, or cutaneous metastasis.[4] More rarely, AEA can be revealed by systemic symptoms such as fever and general state alteration.[6] The presence of metastases in 70% of cases explains its poor survival prognosis, with an 8% global life expectancy at five years.[4,7] Finally, some cases of AEA involving patients who underwent ePTFE aortic prosthetic bypass have been reported in which AEA was discovered during post-operative follow up.[2,8] Because of these non-specific diagnostic circumstances, CTA, MRA, and PET-CT are required for a diagnosis, showing intraluminal vegetation like development[2,5] mainly involving the descending thoracic aorta.[4,9] Definitive diagnosis always requires anatomopathological examination.[5] In this case, the delay between initial presentation and treatment may have caused the late diagnosis of a rare and atypical presentation of AEA.

Due to the rarity of this pathology and lack of evidence, the optimal management strategy is still being decided. Empirical treatment is based on surgical resection with aortic replacement and concurrent radiotherapy and chemotherapy. Up to now, radical surgery remains the cornerstone of all treatments for angiosarcoma with a five year survival of 11.8%.[2]

In this case, clinical AEA signs resulted in the incidental discovery of sacral and left iliac wing osteolytic lesions, left

pathological per-trochanteric fracture, ALI, and CLTI. Immediately after the initial diagnosis, the oncology multidisciplinary team proposed chemotherapy treatment. Surgical resection was not a possibility because of metastases. Chemotherapy was stopped after six months because of his worsening general status and the occurrence of a left per-trochanteric fracture. When the patient was referred to the vascular surgery team, treatment could not be based on complete resection and aortic replacement due to his poor general state and peri-operative risk. Therefore, it was decided to treat the ALI with axillofemoral bypass and popliteal artery recanalisation. Thrombo-embolectomy was not performed because of the risk of further dissemination and potential adherence of the thrombus. Surgery needed to be performed urgently due to the severity of the ischaemic symptoms. Surgical management was led by his quality of life in this palliative context. During follow up, the patient did not show any recurrence of symptoms, reached the therapeutic goal, and died 15 months after the diagnosis.

In conclusion, AEA is a rare oncological disease in vascular surgery. Causes of CLTI and ALI include atheromatous disease, inflammatory vasculitis, and collagen pathology; however, oncovascular disease is also a cause. Other rare causes of emboli are bacterial or fungal dissemination, vegetations from cardiac valves, or atrial myxoma. This case highlights some clinical and radiological signs suggesting an AEA diagnosis, which will hopefully improve future practice and avoid diagnostic delay. Some clinical symptoms are non-specific, such as general state alteration and bone, visceral, or cutaneous metastases, but also include ALI and CLTI. Finally, CTA seems to be more helpful in finding irregular intra-aortic vegetations without any calcification and parietal involvement, leading to an AEA diagnosis rather than atheromatous disease, associated with a PET-CT.

Physicians need to consider AEA as a cause of ALI or CLTI in patients with altered general status but mostly with irregular intra-aortic vegetations without any calcification and parietal involvement on CTA.

REFERENCES

1 Keltner CH, Lima APS, West M, Gundle KR, Fuss C, Davis LE. Primary aortic angiosarcoma: a review of two cases highlighting unique imaging and clinical characteristics. *Radiol Cardiothorac Imaging* 2021:3.

2 Brylka D, Demos TC, Pierce K. Primary angiosarcoma of the abdominal aorta: a case report and literature review (aortic angiosarcoma). *Abdom Imaging* 2009;**34**:239—42.

3 Gage MM, Nagarajan N, Ruck JM, Canner JK, Khan S, Giuliano K, et al. Sarcomas in the United States: recent trends and a call for improved staging. *Oncotarget* 2019;**10**:2462—74.

4 Chiche L, Mongrédien B, Brocheriou I, Kieffer E. Primary tumors of the thoracoabdominal aorta: surgical treatment of 5 patients and review of the literature. *Ann Vasc Surg* 2003;**17**:354—64.

5 Fatima J, Duncan AA, Maleszewski JJ, Kalra M, Oderich GS, Gloviczki P, et al. Primary angiosarcoma of the aorta, great vessels, and the heart. *J Vasc Surg* 2013;**57**:756—64.

6 Boustani M, Dion J, Benali K, Sigal-Cinqualbre A, Crahes M, Alsac JM, et al. Aortic angiosarcoma masquerading as inflammatory aortitis. *Clin Exp Rheumatol* 2019;**37**:148—9.

7 Buehler D, Rice SR, Moody JS, Rush P, Hafez GR, Attia S, et al. Angiosarcoma outcomes and prognostic factors: a 25-year single institution experience. *Am J Clin Oncol* 2014;**37**:473—9.

8 Fenton J, Veenstra M, Bove P. Angiosarcoma involving native abdominal aortic aneurysm sac after endograft repair. *Ann Vasc Surg* 2014;**28**:490.

9 Anthonissen N, Menting T, Verkroost M, Morshuis W. Angiosarcoma of the descending aorta, diagnostic difficulties. *EJVES Short Rep* 2016;**32**:4—6.