



An Unexpected Culprit Behind Abdominal Pain: Aortic Thrombosis in DKA

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INTRODUCTION

Acute aortic thrombosis (AAT), also known as acute aortic occlusion (AAO), is a rare but life-threatening condition that can cause blockage at one or multiple levels of the aorta. Despite improvements in diagnostic tools and management strategies, AAT continues to carry a high risk of morbidity and mortality [1]. AAT is uncommon in younger patients. It is more frequently seen in older individuals, particularly those with underlying cardiovascular disease, diabetes, and a history of smoking. Clinical outcomes depend largely on the underlying cause and associated comorbidities[2]. Aortic thrombosis can arise from several underlying factors, most commonly hypercoagulable states and abnormalities of the aortic wall. (3,4).

DESCRIPTION

We report a case of a 45-year-old Indian woman with a long history of poorly controlled diabetes mellitus type 2. The patient presented with severe abdominal pain, vomiting and diarrhea. On admission, she had a physiological presentation of shock, complicated by severe metabolic derangement : random blood glucose of 428 mg/dL, urinary ketones (++) , arterial pH 7.03, serum bicarbonate 6.4 mEq/L. Computed tomography angiography showed a large thrombus in the abdominal aorta, specifically in the origin of both the celiac and superior mesenteric artery, causing near-total luminal occlusion with evidence of splenic, hepatic, and mesenteric ischemia. (figure 1, 2, 3,)



Figure 1: Sagittal contrast-enhanced CT of the abdomen and pelvis showing abdominal aortic thrombosis (red arrow). Also, Coronal contrast-enhanced CT of the abdomen and pelvis showing abdominal aortic thrombosis (red arrow).



Figure 2: Axial contrast-enhanced CT of the abdomen showing a large intraluminal thrombus (red arrow) within the abdominal aorta extending near the origin of the celiac artery.

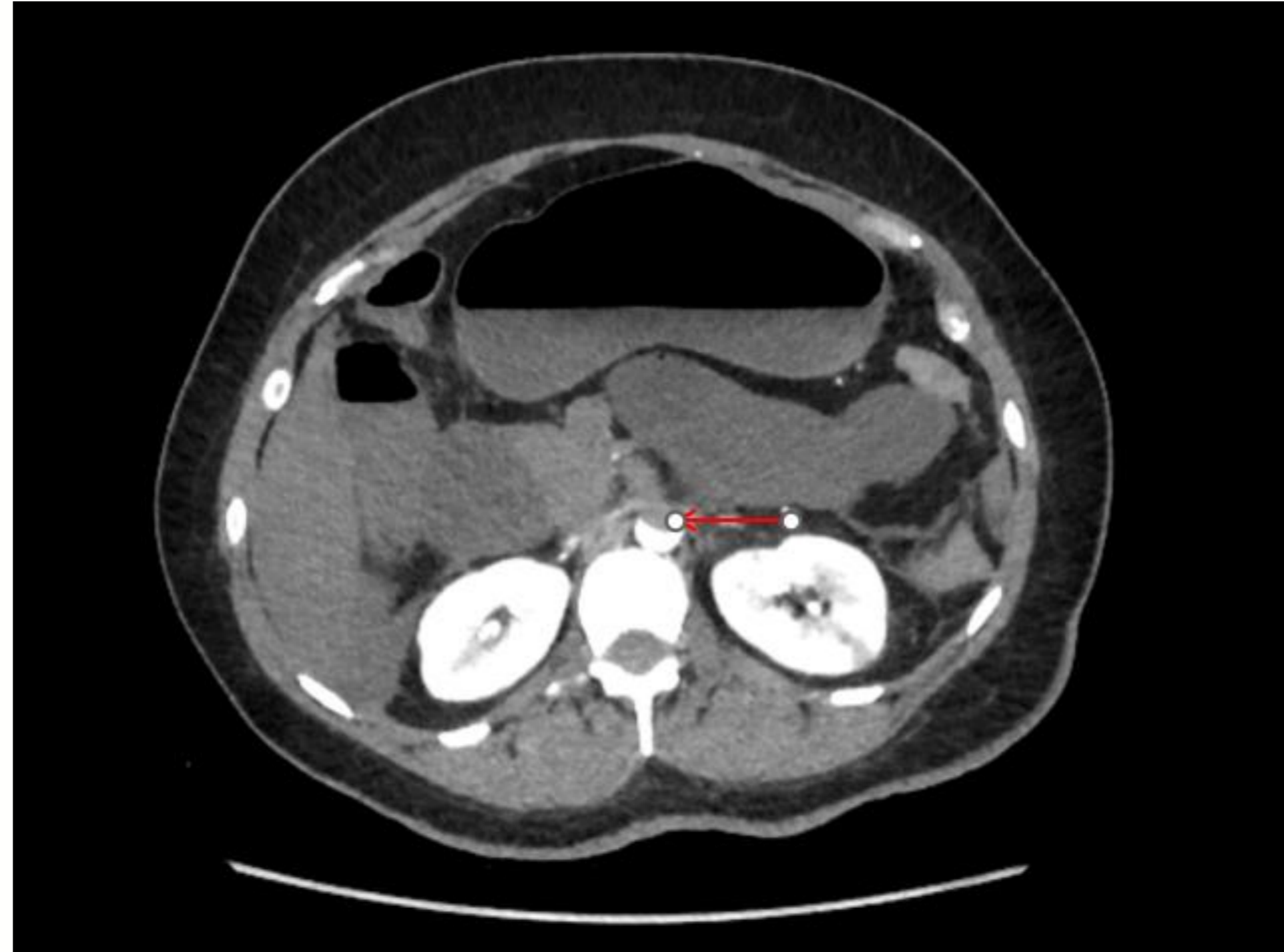


Figure 3: Axial contrast-enhanced CT of the abdomen showing a large intraluminal thrombus (red arrow) within the abdominal aorta extending near the origin of superior mesenteric artery.

Lab results showed disseminated intravascular coagulation (Prolonged APTT 53.9 seconds, PT 25.2 seconds , INR 2.47 seconds and D-dimer > 10 mg/L FEU), acute liver damage (AST 15,292 U/L, ALT 9,551 U/L), kidney dysfunction (Creatinine 1.99 mg/dL, Urea 46 mg/dL, eGFR 27 mL/min) and significantly increased cardiac biomarkers (Troponin I 54.3 ng/ml, LDH 21,901 U/L). ECG showed sinus tachycardia with ST-segment elevation in leads II, III, and aVF, compatible with an acute inferior-wall myocardial infarction. Echocardiography revealed a mildly dilated left ventricle with mid-inferoseptal, anteroseptal and inferior hypokinesia, an akinetic apex, and severely reduced systolic function with an ejection fraction of 38 %. Despite intensive care management with heparin, vasopressors, mechanical ventilation, and correction of metabolic acidosis; this culminated in cardiac arrest and death a few hours after developing refractory shock and multiorgan failure.

Discussion

Acute aortic thrombosis (AAT), also known as acute aortic occlusion (AAO), is a rare but life-threatening condition that can cause blockage at one or multiple levels of the aorta. Despite improvements in diagnostic tools and management strategies, AAT continues to carry a high risk of morbidity and mortality [1]. AAT is uncommon in younger patients. It is more frequently seen in older individuals, particularly those with underlying cardiovascular disease, diabetes, and a history of smoking. Clinical outcomes depend largely on the underlying cause and associated comorbidities[2]. Aortic thrombosis can arise from several underlying factors, most commonly hypercoagulable states and abnormalities of the aortic wall. Reported causes include inherited or acquired thrombophilias, malignancy, autoimmune or inflammatory diseases, metabolic disturbances such as diabetic ketoacidosis, low-flow states, endothelial injury, and recreational drug use. [3,4]. Supporting this, a retrospective study by Vaideeswar et al. [5] reviewed 30 cases of non-aneurysmal, non-atherosclerotic aortic thrombosis over a 14-year period and found that the abdominal aorta was involved in nearly half of the patients. Unlike typical atherosclerotic occlusion, these cases were largely driven by hypercoagulable conditions and changes in the aortic wall.

Patients with acute aortic thrombosis often present with abrupt signs of severe ischemia, most commonly affecting the lower extremities. Typical features include sudden bilateral leg pain, pallor, coldness, loss of pulse, paresthesia, and, in advanced cases, paralysis. In addition to limb ischemia, the involvement of the mesenteric vessels may lead to acute mesenteric ischemia, presenting as an acute abdomen with severe abdominal pain, nausea, vomiting, and signs of bowel ischemia, as well as other organ infarctions such as splenic, hepatic and pancreatic infarctions. In contrast, chronic aortic occlusion due to atherosclerotic disease allows time for collateral circulation to develop, leading to more insidious symptoms. [6] The first most important step in diagnosing aortic thrombosis is acknowledging it. High clinical suspicion is extremely crucial because fast diagnosis of AAT is the key to immediate treatment and relatively better prognosis. Laboratory investigations such as blood count, blood pH, and lactic acid levels can give a hint to an established ischemia. This should be followed by CT as the primary imaging modality and the standard technique for the evaluation of the aorta. [7,8] No robust evidence or explicit guidelines exist on the management of AAT therefore current approaches are based on case reports and literature study. It is individualized , based on the site of occlusion and other factors such as causes , complications and comorbidities. Immediate treatment is essential, as early revascularization is limb- and organ-saving and improves outcomes. Management depends on the level of occlusion and include options like anticoagulation therapy alone , thrombolysis, thromboaspiration and thromboembolectomy.[7] Long-term recommendations include continued anticoagulation (INR 2.5–3.5), risk- factor control (BP, glucose), and discontinuation of oral contraceptives for females. Patient education on signs of embolism is essential because recurrence can occur despite treatment.[8]

CONCLUSION

This case highlights the fatal interplay of diabetic ketoacidosis, lactic acidosis, and acute aortic thrombosis. The combined effect of dehydration, endothelial dysfunction, and hypercoagulability caused extensive thrombo-ischemic damage. Prompt imaging and vascular intervention coupled with early recognition and keeping arterial occlusion in the differential diagnosis of a diabetic patient presenting with severe abdominal pain and metabolic acidosis is important in ensuring improved survival, although the prognosis is bad when multiorgan failure has occurred.

References

1. Refinetti, P., Legay, L., Fontaine, J., & Peyrony, O. (2019). Abdominal aortic occlusion due to acute thrombosis. *Internal and Emergency Medicine*, 14(6), 1003–1004. <https://doi.org/10.1007/s11739-019-02102-7>
2. Robinson, W. P., Patel, R. K., Columbo, J. A., Flahive, J., Aiello, F. A., Baril, D. T., Schanzer, A., & Messina, L. M. (2016). Contemporary management of acute aortic occlusion has evolved but outcomes have not significantly improved. *Annals of Vascular Surgery*, 34, 178–186. <https://doi.org/10.1016/j.avsg.2015.12.021>
- 3- Hahn, T. L., Dalsing, M. C., Sawchuk, A. P., Cikrit, D. F., & Lalka, S. G. (1999). Primary Aortic Mural Thrombus: Presentation and treatment. *Annals of Vascular Surgery*, 13(1), 52–59. <https://doi.org/10.1007/s100169900220>
- 4- Arima, T., Muroya, K., Kawamoto, K., Koba, Y., & Omura, T. (2018). Aortic thrombosis in a patient with Malignant Disease: A literature review and case presentation. *Vascular and Endovascular Surgery*, 53(2), 139–144. <https://doi.org/10.1177/1538574418813623>
- 5- Non-atherosclerotic aorto-arterial thrombosis: A study of 30 cases at autopsy. (2001, March 1). PubMed. <https://pubmed.ncbi.nlm.nih.gov/11590283/>
- 6- Hart, A., & Lee, E. Y. (2020). Multidetector Computed Tomography of Pediatric Vascular Imaging with Advanced Postprocessing Techniques. *Advances in Clinical Radiology*, 2, 191–211. <https://doi.org/10.1016/j.yacr.2020.06.003>
- 7- Patrício, C., Silva, M. M., Silva, P. E., Oliveira, J., & Bagulho, L. (2018). Massive organ embolization from primary aortic thrombosis. *Revista Portuguesa De Cardiologia (English Edition)*, 37(5), 447.e1–447.e6. <https://doi.org/10.1016/j.repc.2017.02.019>
- 8- Abdi, N. M., Shieb, M., & Shafiei, M. (2023). Idiopathic Extensive Abdominal Aortic Thrombosis with Extension to the Celiac Trunk and Mesenteric Arteries in a Previously Healthy Female. *Dubai Medical Journal*, 6(3), 169–174. <https://doi.org/10.1159/000525558>