

Aortic Thrombosis-A Rare Phenomenon, What Could Have Caused it and its Management

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ABSTRACT

Aortic thrombosis is a rare phenomenon. Many reasons could cause it, such as smoking cigarettes, a sedentary lifestyle, diabetes, hypertension, coronary artery diseases, blood disorders such as protein C and S deficiency, factor V Leiden, and a personal history of thromboembolism. In the last 3-4 years, COVID-19 infection has also been related to arterial thrombosis. Immunothrombosis with the activation of the complement system is considered the pathway for thrombosis in COVID-19 infected patients. CTA is now routinely used to detect arterial thrombosis. In many cases, thrombosis may be absent, so TTE or even TEE is used to detect aortic thrombus. Aortic thrombus can be treated medically or surgically, depending on its location and the patient's medical condition. The timing of thrombus detection is crucial, as it plays a vital role in improving the patient's prognosis. Here is a short commentary about the same.

Keywords: Aortic thrombus; Transesophageal echocardiogram; COVID-19; Anti-coagulation

INTRODUCTION

Aortic thrombosis is rare and can be acute or chronic. Acute aortic thrombosis is a rare, life-threatening event that leads to a sudden occlusion of the aorta, which causes high mortality and morbidity despite modern available treatment options (medical and surgical) [1].

Aortic thrombosis can be due to many reasons, such as smoking, a sedentary lifestyle, coronary artery diseases, diabetes, hypertension, and blood disorders. Blood disorders include protein C and S deficiency, factor V Leiden, and previous history of thromboembolism. A case report and study were done in 2020 in the UK; there were several cases of arterial thrombosis related to COVID-19 infection, thus making COVID-19 one of the emerging causes of arterial thrombosis [2].

DESCRIPTION

A study done in 2020 demonstrated that the mechanism of immunothrombosis in COVID-19 infection starts with complement system/pathway activation. This study elaborated on the pathophysiology and mechanism of COVID-19 immunothrombosis. The study demonstrated that complement,

thrombin, and Neutrophil Extracellular Trap (NET) represent promising therapeutic targets. In this study they found that the treatment of neutrophils with COVID-19 platelet-rich plasma generated tissue factor bearing neutrophil extracellular trap that induced thrombotic activity of human aortic endothelial cells [3]. A study done in 2022 in France showed that acute aortic thrombosis is a devastating complication of COVID-19 infection. It also showed that early diagnosis and surgical repair are paramount to limiting poor outcomes in patients with acute aortic thrombosis [4].

With the rapid development of Computed Tomography (CT) technology, excellent spatial and temporal resolution with lower radiation and powerful post-processing techniques are now available, which can demonstrate lesions inside the aortic lumens. CT Angiography (CTA) is now the routine examination of choice for aortic thrombus. However, there are some limitations to CTA. Transesophageal Echocardiography (TEE) is used widely all over the world and can detect the lesion dynamically. Magnetic resonance imaging is also used widely because of its specific advantages. Digital subtraction angiography is an invasive method and is only preserved for interventional therapy [5]. In 2021, a systematic literature review

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in Germany showed that aortic thrombus could be present with no clinical symptoms or as a primary symptom in otherwise asymptomatic COVID-19 patients. In such cases, D-Dimers are a highly sensitive diagnostic tool. If an aortic thrombus could be detected before complications develop, it could save many lives [6].

CONCLUSION

There are different treatment options for acute aortic thrombus, including both surgical and non-surgical. As per the case report published in 2023 in Korea, a patient with aortic thrombus was treated with anticoagulation and, in 3 weeks, reported regression of the thrombus in follow-up CT chest. Anticoagulants could be oral, IV (heparin), or subcutaneous (heparin or enoxaparin). In 2022, a case report with an ascending aorta thrombus was surgically treated with no evidence of recurrence within one year. The treatment strategy for an aortic thrombus should depend on the thrombus's location and the patient's condition, but surgical treatment should be considered where possible to achieve a better prognosis. So, the timing of aortic thrombus detection is crucial in improving a patient's prognosis. Sometimes, an aortic thrombus could be missed with CTA or Transthoracic Echocardiography (TTE). In those cases, TEE plays a significant role.

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