

Paraneoplastic Floating Thrombus of the Abdominal Aorta: A Rare Cause of Peripheral Arterial Embolism

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Abstract: Thrombus in the aorta is frequently associated with aortic atherosclerosis in patients with cardiovascular risk factors. However, a thrombus in the aorta not related to aneurysm or atherosclerosis is a rare clinical entity with a limited number of cases reported. The treatment remains an object of controversy. Herein, we report the case of a 55-year-old woman who presented with an acute intestinal occlusion due to a small bowel tumor which revealed to be malign in the anatomopathology exam. The patient underwent surgery with a tumor resection and a double stoma. The surgical outcomes were characterized with a left lower limb critical ischemia. A computed tomography scan angiography showed a floating thrombus of the sub renal abdominal aorta. Thus, an embolectomy was performed and an anticoagulating treatment introduced, with a great outcome. While conservative medical treatment certainly represents a cornerstone of primary approach in asymptomatic patients, management becomes demanding in presence of symptoms or distal embolism. A few cases have shown that a conservative approach with anticoagulants represents a viable option. However Moris *et al.* suggested that the strategy should be chosen based on peculiar characteristics of thrombus like its location, mobility, morphology, persistence of symptoms under anticoagulants and high risk of recurrence.

Keywords: Thrombus; aorta ; embolism ; anticoagulation ; embolectomy.

INTRODUCTION

Distal arterial embolism is a relatively common problem that carries increased morbidity and, potentially, mortality [1]. Over 80% of all peripheral and visceral emboli originate from disturbances of cardiac function itself such as atrial fibrillation, myocardial infarction, endocarditis and prosthetic heart valves [2]. Non-cardiac causes include aortic pathologies such as aneurysmal lesions, dissections, penetrating ulcers or traumatic lesions [3]. In non-aneurysmal and non-atherosclerotic vessels this condition becomes extremely rare, while it represents a source of potential cerebral and peripheral embolic events [4]. Floating thrombus is defined as non-adherent part of the thrombus floating within the aortic lumen [5]. It represents 0.1% of all systemic embolism causes. A thoraco-abdominal and pelvic computed tomography scan realized as part of the aetiological assessment is useful to search for an eventual neoplastic aetiology. The optimal management of these patients is still controversial and depends on the location and morphology of the thrombus, the symptoms and the general condition of the patient [2].

CASE PRESENTATION

A 55-year-old woman, with no alterable cardiovascular risk factors, was hospital admitted owing to an acute intestinal occlusion. An abdominal and pelvic CT angiography realised to search for an aetiology revealed an occlusive ileal tumor that was treated by a surgical resection with a double stoma. The anatomopathological exam of the operative piece revealed a malignant tumor. The surgical outcomes were characterized by a left lower limb acute ischemia. A CT angiography was urgently realised, showing a floating thrombus in the sub-renal aorta with 2.5 centimeters length and 1.7 centimeters width, with no signs of aortic dissection or intramural hematoma. Further investigation by means of a transthoracic echocardiography showed no embolic cardiac cause. According to a high embolism risk of the floating thrombus, which already occurred to this patient, conservative medical treatment by heparinization immediately appeared inappropriate and the patient was scheduled for emergency surgical thrombus removal, by bi femoral embolectomies. The outcomes was complications free at three months follow up.

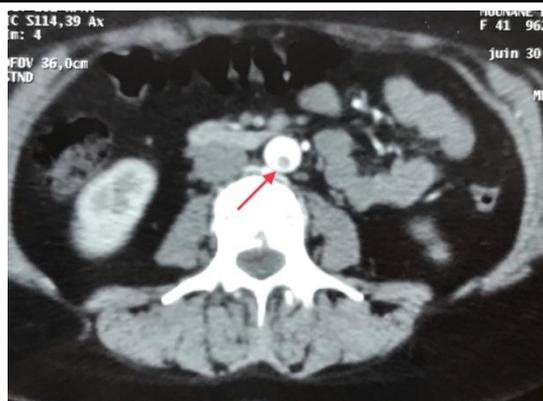


Fig-1 : CT angiography showing a floating thrombus in the sub-renal aorta

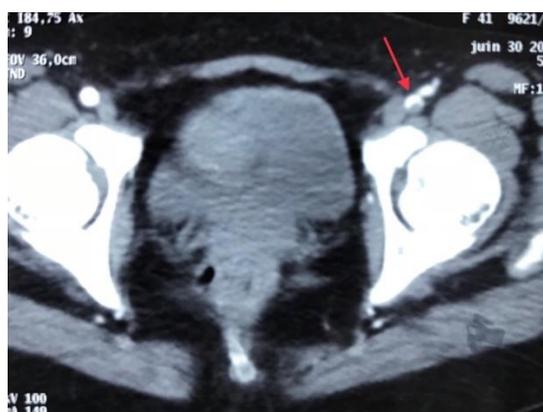


Fig-2: CT angiography showing thrombus embolism into left common femoral artery

DISCUSSION

Thrombus in the non-aneurysmal non-atherosclerotic descending thoracic aorta (NAATDA) is an unusual source of arterial embolism [2]. The incidence of aortic mural thrombus was reported by Machleder *et al.* [6] to be as low as 0.9% (95 cases) in a study of 10,671 autopsies. Only about half of these patients had aneurysmal disease and only 17% of the patients had evidence of peripheral embolism. The true incidence of mural thrombus in NAADTA is unknown but it is possibly much higher than that reported in the literature [2]. The reported cases of mobile thrombus in the thoracic aorta were limited to 100 published cases in a review by Choukroun *et al.* [7]. The thrombus may be found in the ascending aorta, and some cases of a thrombus in the abdominal aorta and the aortic arch were also reported [7, 8]. The aetiology of thrombus formation in a macroscopically normal aorta is not well understood [2]. A correlation with underlying malignant disease, hypercoagulable disorders, primary endothelial disorders or even iatrogenic causes has been suggested [2, 9, 10,11,12-15]. Meanwhile the pathophysiological mechanism of thrombi still remains unclear, as patients frequently do not suffer from coagulopathies, immunological disorders or malignancies [4]. In non-aneurysmatic, non-atherosclerotic vessels and in absence of a clear etiology Behcet's disease can be suggested as a possible cause, particularly among

countries around Mediterranean Sea [4], but this was not our case. The diagnosis is based on the use of advanced imaging including 24-h electrocardiography, TEE, CT angiography or MRA of the thoraco-abdominal aorta and arterial duplex ultrasound of the vessels proximal to the embolic occlusion [2]. In our case the positive and aetiological diagnosis was confirmed by a CT angiography that showed the floating aortic thrombus and revealed the presence of an intestinal tumor, and a TEE eliminated any cardiac cause. The optimal treatment of NAADTAs remain debatable. Several authors [16, 17] have described catheter-guided thrombolysis to treat mural aortic thrombus, a therapy that has later been associated with a significant risk of additional peripheral embolism [2]. In particular, there is the potential danger of lysing pedunculated lesions, releasing the bulk of the thrombus and causing massive embolisation [17]. While conservative medical treatment certainly represents a cornerstone of primary approach in asymptomatic patients, management becomes demanding in presence of symptoms or distal embolism [4]. Embolisms (e.g. cerebral) could significantly limit the surgical options. Moris *et al.* suggested the strategy should be chosen based on peculiar characteristics of thrombus like its location, mobility, morphology, persistence of symptoms under anticoagulants and high risk of recurrence [18]. While the dimensions of the thrombus

are never considered as main criterion, the location of thrombus strongly affects the possible surgical strategies. Choukroun *et al.* [7] suggested that surgical treatment should be reserved for patients not responding with thrombus resolution on follow-up TEE after 2 weeks of therapeutic anticoagulation.

with heparin. Our patient underwent surgery due to the thrombus high mobility and high risk of embolism recurrence. A few cases have shown that a conservative approach with anticoagulants represents a viable option [19, 20]. Other series have demonstrated that therapeutic oral anticoagulation is an efficient and safe option in patients with aortic mural thrombus [8, 21]. However, a careful patient selection is necessary, as cases of persistent or recurrent embolism under coumadin derivatives have been described [22]. The proposed duration of oral anticoagulation varies among authors, ranging in time from complete resolution of the thrombus to lifelong [2]. In a review of patient outcomes in 23 cases, complete thrombus resolution occurred in 74% (n=17) of the cases [7, 21, 23-27].

CONCLUSION

Non aneurysmal and non atherosclerotic aortic floating thrombus represents an underdiagnosed medical entity, which could potentially explain many cases of cryptogenic embolism [2]. An underlying cause should be thoroughly searched for. The treatment remains an object of controversy, but we consider that the surgical treatment should be limited to a thrombus with high risk of embolism and to patient who fail the conservative approach.

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