Case report - Cardiac general

Floating intra-aortic thrombus presenting as distal arterial embolism

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Received 26 February 2009; received in revised form 19 April 2009; accepted 20 April 2009

Abstract

Floating thrombi in the aorta are a rare finding in the absence of any coagulation abnormality. They often represent a surgical emergency. Our case refers to a 45-year-old woman who presented with acute ischemia of the upper extremity. This was a result of peripheral embolism originating in a floating thrombus in the ascending aorta. A free-floating lesion held by a pedicle from the lateral ascending aortic wall was demonstrated using computed tomography and magnetic resonance scans. There was no pre-existing clotting abnormality.

Conservative treatment with oral anticoagulation was not successful in removing the lesion. Therefore, a surgical approach was selected through a median sternotomy and cardiopulmonary bypass. Under temporary hypothermic circulatory arrest, the ascending aorta was opened. The lesion was removed along with a rim of aortic wall, circulation was re-established and the aorta was reconnected with use of a synthetic interposition graft. Postoperative course was uneventful. The patient was discharged on oral anticoagulation. Histopathology confirmed the lesion as thrombus. Only a few cases of intra-aortic thrombus without any coagulation abnormality basis are described in literature. Occasionally, they present as distal embolism. Treatment should be surgical excision on cardiopulmonary bypass, a procedure performed safely with excellent outcome.

Keywords: Ascending aorta; Embolism; Thrombosis; Cardiopulmonary bypass

1. Introduction

Floating thrombi in the ascending aorta are a rare finding especially in the absence of any co-existing coagulation abnormality. They can represent a surgical emergency when they produce peripheral emboli. We present a case of intra-aortic floating thrombus which caused distal embolic phenomena.

2. Clinical summary

A 45-year-old woman was initially admitted after a right cerebral hemisphere transient ischemic attack. Symptoms also included experiencing intermittent numbness and discolouration in her right index finger for the past few months. Clinical examination showed ischemic appearance of the distal right index finger and absence of ipsilateral radial artery pulse.

She was a moderate smoker and had a history of medically well-controlled hypertension. She did not take any contraceptive or hormone based medication. Electrocardiogram, chest radiography and laboratory tests including immunological and coagulation studies (complete thrombophilia profile) were normal.

Magnetic resonance (MR) angiography was performed and showed an occlusion of the right brachial artery as well as a filling defect in the ascending aorta. A mass measuring 1.4 × 1.1 × 1.5 cm was seen attached by a small pedicle to the posterior wall of the ascending aorta just proximally to the aortic arch (Fig. 1). Transthoracic echocardiography confirmed the presence of the mass and suggested that it could be a possible thrombus.

Right upper extremity ischemia was resolved eventually. The patient was initially anticoagulated with heparin and then was discharged on warfarin.

She was followed-up with computed tomography and transoesophageal echocardiography which showed persistence of the filling defect and of the mass despite therapeutic anticoagulation levels. Moreover, a new projection pushing inferiorly into the lumen was discovered. To exclude a mitotic lesion and prevent further distal embolism, decision was made to remove the thrombus surgically.

The operation was conducted using cardiopulmonary bypass with cannulation of the right atrium and arterial return to the right common femoral artery. The patient was cooled to 18 °C. Crystalloid cardioplegia was administered into the aortic root. It was decided not to apply an aortic clamp in order to avoid fragmentation of the lesion. Following circulatory arrest a longitudinal aortotomy was performed. A pedunculated free-floating mass sized 26 × 12 × 5 mm was localized in the posterior wall of the ascending aorta (Fig. 2). The surrounding aortic intima had normal appearance without any obvious atherosclerotic disease. The aortic valve was tricuspid with no calcification. The mass was excised along with a ring of...
ascending aorta measuring 2 cm on each side of the lesion. Frozen section showed an eosinophilic mass with no element of malignancy. The distal ascending aorta was clamped and circulation re-established. The ascending aorta defect was replaced with a Dacron® 26 mm interposition graft. The patient was disconnected easily from cardiopulmonary bypass. In-hospital stay was 5 days postoperatively. The patient was discharged home on anticoagulation (warfarin for 1 year).

Histopathology reported the mass as a cellular thrombus related to an aortic wall with only focal intimal thickening. Follow-up a year after the procedure did not show recurrence of the thrombus locally or any other thromboembolic event.

3. Discussion

Systemic embolization of cardiac origin may include atrial fibrillation, endocarditis, left ventricle aneurysm or prosthetic valves. Non-cardiac causes can be a great vessel aneurysm, a partially ruptured atherosclerotic plaque or paradoxical emboli. Thrombus formation is also considered to be closely related to hypercoagulable state either due to genetic factors, other disease or medication side effect.

Floating thrombi of the ascending aorta not related to atherosclerotic disease and not caused by a state of abnormal coagulation are extremely rare [1]. Usually, they are diagnosed as a result of an embolic event.

In our case, investigations did not reveal any pre-existing hypercoagulation tendency. There was no family history, no procoagulant medication and the patient was not a smoker.

The normal histological profile of the aorta also contributes to the hypothesis that the thrombus formation was due to an unknown mechanism. We believe that this is the main interesting feature in our present case. Literature shows that in the very few similar cases no clotting abnormalities were found despite extensive investigation [2]. There has been speculation in other studies regarding the role of possible interaction between locally produced and released tissue plasminogen activator with anti t-PA agents. It has been reported that this might present even an explanation for aortocoronary graft occlusion [3, 4].

It seems that though most such patients are treated with adequate anticoagulation, this has not a significant effect to the formed thrombus. It has been suggested that it might even be responsible for fragmentation and further embolisation.

Therefore, most authors suggest that definite treatment involves operative excision of the mass during cardiopulmonary bypass, occasionally including hypothermic circulatory arrest, depending on the position of the thrombus [1, 5]. This seems to be a relatively safe procedure as it has been also shown in our case.

References


