Case Report

Successful management of huge floating thrombus within aortic arch in a patient with old myocardial infarction

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Summary Few cases of a floating thrombus in an aorta have been reported without any systemic embolic complications. We report an unusual case of a huge floating thrombus (3 cm × 10 cm in size) in the aortic arch. The patient had a history of old myocardial infarction and had undergone successful percutaneous coronary intervention 16 years previously. The aortic thrombus was detected incidentally after echocardiography and computed tomography without any evidence of aortic dissection or distal embolization. The huge thrombus was removed successfully from the aortic arch by urgent surgery.

Introduction

A floating thrombus within the aortic arch is a rare condition that is generally detected after cerebral, visceral, or peripheral emboli [1]. We report a case of incidentally found huge floating thrombus in aortic arch without distal emboli in a patient with old myocardial infarction.

Case report

A 65-year-old man visited the out-patient clinic for a regular check up. Although he had a history of percutaneous coronary intervention due to acute myocardial infarction 16 years previously, he had no experience of angina or
other cardiovascular symptoms during follow-up. He was a 10 pack-year ex-smoker and his lipid profile was poorly controlled. The resting electrocardiogram disclosed normal sinus rhythm without any pathologic findings. The transthoracic echocardiographic (TTE) examination showed preserved systolic function and no valvular abnormality despite old posterior myocardial infarction. In the routine view of suprasternal notch, we found a mass-like lesion and abnormal eccentric color jet in the aortic arch (Fig. 1A). We could hear abnormal bruit along the aortic arch. Subsequently, transesophageal echocardiography (TEE) was performed for evaluation of the thoracic aorta, revealing a large, more than 10 cm sized hypermobile pedunculated cylindrical mass in the aortic arch (Fig. 1B and C). Its margin was smooth, internal contour was homogeneous comparatively. It appeared to attach to the posterior wall of the proximal aortic arch and to extend into the left subclavian artery and the descending aorta. Computer tomography confirmed the presence of the mass seen in TEE (Fig. 1D–F). The entire thoracic aorta had normal dimensions with some visible atheromatous plaques.

He had no subjective symptoms suggesting distal emboli during 16 years of follow-up. We could not find any physical signs that suggested systemic emboli. We checked thrombin, prothrombin, and partial thromboplastin times, as well as antithrombin III, protein C and S antigens, anticardiolipin antibodies, and lupus anticoagulant. There was no evidence of coagulopathies or trauma.

But, he had not taken aspirin and clopidogrel due to intractable gastrointestinal trouble induced by anti-platelet medications.

Because of the high risk for peripheral embolization due to the size and the mobility, we performed urgent surgical excision of the mass. At surgery, the aorta was approached

Figure 1 Transthoracic echocardiographic suprasternal notch view shows mass-like material and eccentric color jet in aortic arch level (A). Transesophageal echocardiographic cross-sectional (B) and longitudinal (C) images show a long, floating thrombus in the aortic arch. The adjacent aortic wall was thickened with diffuse atherosclerosis and focal calcified plaque. Computed tomographic images show a huge floating thrombus in the aortic arch (D–F). Arrow indicates thrombus.

Figure 2 These are gross finding from operation field (A) and excised specimen from aortic arch (B). Glossy red friable mass was 3 cm × 11 cm in size.
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via a median sternotomy and incised longitudinally under total circulatory arrest and retrograde cerebral perfusion. Organized red fresh parietal thrombus was removed manually from the aortic arch. The surface was smooth and friable.

The specimen did not show evidence of malignancy on histopathologic examination. There was a focal aggregation of neutrophils in the tissue and adjacent aortic wall was thickened with calcified plaques (Fig. 2).

The postoperative course was uneventful and the patient was discharged 10 days after the surgery with medication including aspirin. Postoperative TTE showed an intact contour wall in the aortic arch without echogenic mass.

Discussion

Aortic thrombi can occur anywhere in the aorta and are important causes of distal embolization. Formation of friable floating thrombus, especially in the aortic arch, creates a life-threatening risk of stroke, as well as peripheral embolization [2]. Many factors, such as atherosclerosis, dissection, trauma, malignancy, and coagulopathies, have been associated with aortic mural thrombi. Aortitis is a possible cause of aortic thrombus [3].

Generally, thromboembolic events are associated with advanced age, and complex and ulcerated atherosclerotic plaques to which the thrombus is attached. Left subclavian artery seems to be one of the predisposed localizations for thrombus formation, interestingly [4]. In our patient, the origin of the aortic thrombus was an atheromatous lesion in the posterior wall of the aortic arch, and the remaining part of the aortic arch had some atherosclerotic change. There was focal aggregation of neutrophils in the atheromatous lesion, and the base of the thrombus was slightly dimpled with shallow ulceration. Without dissection, trauma, malignancy and coagulopathy, the formation of huge aortic thrombus is a very rare situation. It is possibly a response to focal aortitis. Discontinuation of aspirin due to gastrointestinal trouble and poorly controlled lipid profile may affect the formation of thrombus. But, we do not know exactly the real force and protective mechanisms related to no embolic episode despite huge floating aortic thrombus.

Thrombolysis is a treatment option for aortic thrombus, and heparin and warfarin have led to complete resolution sometimes. In some cases, anticoagulant therapy can be given initially with heparin for several days. If the thrombus shows reduction in size, the heparin therapy is continued until the thrombus resolves. If anticoagulant therapy fails, surgical intervention should be considered. Surgical intervention is preferred to anticoagulant regimen in young patients, in the presence of a large hypermobile thrombus (as in this case report), and in patients with recurrent embolic events [5]. Because a floating and friable thrombus carries an unacceptable risk of partial lysis and distal embolization, surgical excision has an indication for large floating thrombi.

Thromboaspiration is another option for acceptable lesions. Endovascular stent-grafting provides a new minimally invasive therapeutic option in the treatment of symptomatic mobile thoracic aortic thrombus [6]. However, its role in the setting of aortic thrombosis regarding the long-term outcome is not established yet.

We luckily found the floating thrombus incidentally before embolic complication by the routine TTE view of suprasternal notch initially. Therefore the routine check of suprasternal notch view is important particularly in patients with atherosclerosis despite a poor echo window in adults. If some aortic lesion is doubtful, it is helpful to confirm by TEE. Because primary or metastatic tumor such as angiosarcoma or leiomyosarcoma could be found in the aortic arch, it is sometimes necessary to perform a differential diagnostic workup. Prospective studies are required to address the issue of evidence-based guidelines and optimal approaches for the diagnostic, therapeutic, and follow-up management of these patients.

References