

Case Report

Mobile Masses in the Aortic Arch in a Patient with Acute Embolic Event

LOUKIANOS S. RALLIDIS¹, COSTAS PAPADOPOULOS¹, PANAYOTES C. MICHAIL²,
IOANNIS PARASKEVAIDIS¹, MARIA ANASTASIOU-NANA¹

¹Second Department of Cardiology, Attikon Hospital, School of Medicine, University of Athens, ²Cardiac Surgery Department, Athens Medical Center, Athens, Greece

Key words: Aortic arch atherothrombi, acute embolic event, echocardiography.

We describe a 45-year-old woman with peripheral embolism in whom echocardiography revealed mobile masses in the aortic arch that were characterized as atherothrombi. The masses were resected surgically 2 months later, since treatment with antiplatelets, anticoagulants and statins failed to resolve them.

Complex aortic arch atheromatosis (plaque thickness ≥ 4 mm or plaque with mobile elements) is a potential source of emboli that has become increasingly common nowadays due to the advent and widespread use of echocardiography.^{1,2} We report the case of a 45-year-old woman with peripheral embolism in whom an echocardiographic study revealed mobile masses in the aortic arch.

Case presentation

A 45-year-old woman presented with acute ischemia of the left upper extremity, which was attributed to embolism of the left brachial artery. She had a history of smoking and hypercholesterolemia and had also suffered a myocardial infarction 5 years before. The coronary angiogram at that time revealed atheromatous plaque but without significant stenoses in the coronary arteries. The patient had been well until the present hospitalization.

She underwent embolectomy with restoration of the circulation in the left brachial artery. Postoperatively, she developed fever and bleeding at the site of embolectomy. A part of the brachial artery was resected and a cephalic vein graft was

used for the anastomosis. However, the patient's clinical condition rapidly deteriorated and 15 days after her original admission she was transferred to the intensive care unit (ICU) with the diagnosis of septic shock.

The culture of the resected graft revealed *St. aureus* and she was treated with antimicrobial treatment (vancomycin and cloxacillin) and inotropes. Transthoracic (TTE) and transesophageal (TEE) echocardiograms were recorded, mainly to rule out vegetations. Two-dimensional (2D) (Figure 1A) and real-time 3-dimensional (3D) TTE (Figure 1B) revealed two pedunculated echogenic mobile masses in the aortic arch. Figure 2 shows in detail the more distally located mobile mass, visualized by real-time 3D TEE. The most probable diagnosis was mobile atherothrombi. Laboratory tests for thrombophilic disorders were normal and she was put on anticoagulants, in addition to the antiplatelets and statins that she was already receiving.

The patient's clinical condition improved and she was discharged after 13 days. A follow-up echocardiogram, 2 months later, showed no change in the size of the masses and she had an uneventful surgical

Manuscript received:
March 3, 2010;
Accepted:
June 7, 2010.

Address:
Costas Papadopoulos

26-28 Kiou St.
113 64, Athens, Greece
e-mail:
papcost@gmail.com

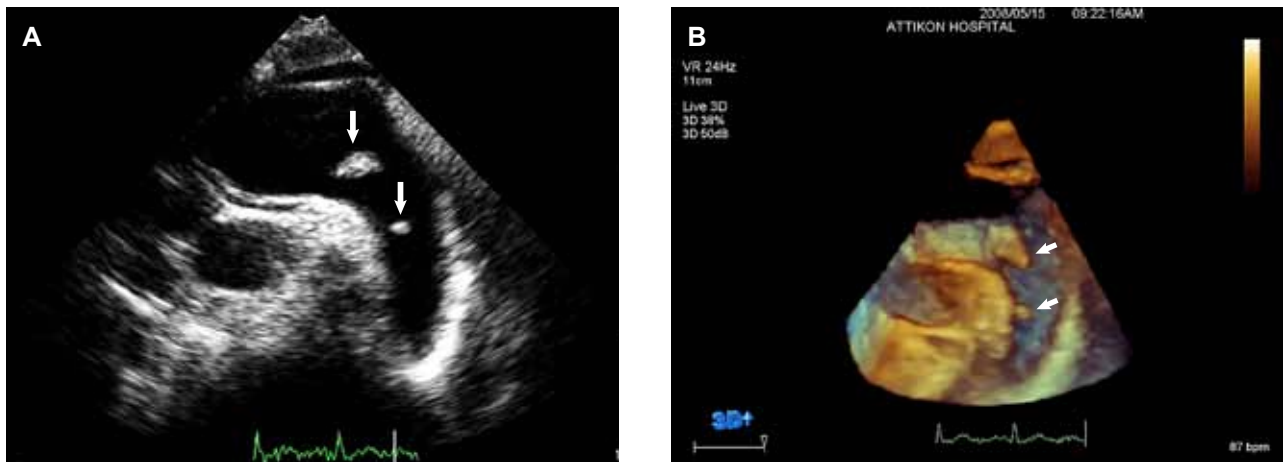


Figure 1. A. Two-dimensional transthoracic echocardiogram (suprasternal view) showing 2 echogenic masses (arrows) protruding into the lumen of the aortic arch, the larger (19 × 10 mm) opposite the origin of the left subclavian artery and the smaller (4 × 7 mm) more distally. B. Real-time 3-dimensional echocardiogram (suprasternal view) showing the 2 masses (arrows) and the relatively wide origin of the larger mass.



Figure 2. Real-time 3-dimensional transesophageal echocardiogram. It nicely shows the distal small echogenic mass (arrow), which has a narrow neck suggesting a high embolic potential. In addition, the surrounding aortic wall is irregular, suggesting an atheromatous aortic wall.

resection of the masses. Histological examination of the masses revealed calcified atherothrombi.

Discussion

Mobile atheromas or atherothrombi in the aortic arch, usually formed on ulcerated plaques, are associated with a 12-fold higher risk for stroke or peripheral embolism.¹ Pathophysiologically, mobile aortic arch atheromas are more likely to act as direct sources of embolism, while the possibility of their being markers of arterial atherosclerotic disease cannot be excluded.

TEE is an accurate, reproducible and widely applicable method for the diagnosis of aortic arch atheromatosis.³ However, the suprasternal view with TTE can also be diagnostic, particularly in cases of large atherothrombotic plaques in the aortic arch.⁴ In our case, the TTE suprasternal view revealed 2 mobile masses located in the aortic arch, but TEE was essential for exploring the rest of the thoracic aorta. In addition, the application of the real-time 3D echocardiogram provided a morphological depiction of the masses and the aortic wall. In particular, the irregular appearance of the aortic wall (Figure 2) suggested that ulcerated atheromatous plaques with the subsequent formation of thrombi may have generated the masses. Future studies will show whether the better imaging of aortic atheromas (size, protrusion, mobility) and aortic wall by real-time 3D echocardiography will provide additional information regarding the embolic potential and the appropriate treatment.

The management of aortic arch atherothrombi remains controversial. At present, the aggressive risk factor management of hypertension and hypercholesterolemia, as well as the use of antiplatelets in all patients with symptomatic aortic atheroma, is a reasonable therapeutic strategy.^{1,2} Anticoagulants should be reserved for mobile atheromas.⁵ Surgical thrombectomy or atherectomy should be applied in patients with a history of embolism and persistent mobile atheromas despite anticoagulation.⁶ In our patient, the administration of anticoagulants, antiplatelets and statins did not resolve the masses; therefore, they were removed surgically.

In conclusion, the presence of mobile aortic atherothrombi seems to carry a high embolic risk. Echocardiographic evaluation of the aortic arch is mandatory in patients with embolism and no obvious source of emboli. Initial assessment can be performed by the suprasternal TTE view, which should be followed by TEE, considered to be the most reliable method for the detection of aortic arch atheromas. The optimal treatment of mobile aortic arch atherothrombi remains to be elucidated.

References

1. Zavala JA, Amarenco P, Davis SM, et al. Aortic arch atheroma. *Int J Stroke*. 2006; 1: 74-80.
2. Macleod MR, Amarenco P, Davis SM, Donnan GA. Atheroma of the aortic arch: an important and poorly recognised factor in the aetiology of stroke. *Lancet Neurol*. 2004; 3: 408-414.
3. Weber A, Jones EF, Zavala JA, Ponnuthurai FA, Donnan GA. Intraobserver and interobserver variability of transesophageal echocardiography in aortic arch atheroma measurement. *J Am Soc Echocardiogr*. 2008; 21: 129-133.
4. Hussein A, Hilal D, Hamoui O, et al. Value of aortic arch analysis during routine transthoracic echocardiography in adults. *Eur J Echocardiogr*. 2009; 10: 625-629.
5. Ferrari E, Vidal R, Chevallier T, Baudouy M. Atherosclerosis of the thoracic aorta and aortic debris as a marker of poor prognosis: benefit of oral anticoagulants. *J Am Coll Cardiol*. 1999; 33: 1317-1322.
6. Choukroun EM, Labrousse LM, Madonna FP, Deville C. Mobile thrombus of the thoracic aorta: diagnosis and treatment in 9 cases. *Ann Vasc Surg*. 2002; 16: 714-722.