

Aortic plaque defined by contrast transthoracic echocardiography

Abstract

The authors explore the use of third generation echo contrast to define plaque in the ascending aorta and exclude more invasive procedures.

Keywords: aortic aneurysm, aortic plaque, aortic dissection, contrast echocardiography, right sternal edge.

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Background

Third generation echo contrast (Definity Perflutren Lipid Microsphere¹ Lantheus Billerica MA, USA) has proven to be a useful diagnostic tool in multiple clinical settings, in particular for left ventricular opacification.^{2,3} Its use has also been documented in the setting of aortic dissection.⁴ Here we present a case where contrast was used to exclude type-A aortic dissection, as well as define plaque in the ascending aorta.

Report

A 78-year-old gentleman was referred for transthoracic echocardiography as part of the work-up for the surgical intervention of an aortic aneurysm. The aneurysm was an incidental finding diagnosed during a CT scan for bronchiectasis. LV opacification using Definity contrast was used to exclude any regional wall motion abnormalities.

The contrast was administered as an intravenous bolus. Although the right sternal edge imaging window was adequate, contrast was also used to more confidently exclude type-A dissection. Contrast imaging demonstrated full thickness flow through the ascending aorta and defined the luminal diameter (68 mm). Eccentric plaque that was not visualised on angiography or traditional B-mode imaging was also clearly highlighted.

Discussion

Aortic aneurysms may be influenced by a number of factors including atherosclerosis, hypertension, inflammation, infection and injury. They are of clinical significance due to their propensity to rupture. An aortic dissection is a life-threatening condition requiring prompt diagnosis and treatment.⁵ Transthoracic echocardiography (TTE) has traditionally only been used in a limited capacity in this setting, due to its relatively poor sensitivity and specificity for detecting aortic dissection. Transoesophageal echo (TOE) is the

preferred bedside technique with a sensitivity of 97.3% and specificity of 94.2%.⁶ The advent of contrast in TTE has been shown to significantly improve the diagnosis of type-A aortic dissection, yielding similar accuracy to that achieved with conventional TOE.⁶ As centres become more confident with this technique, we are likely to witness a shift towards contrast TTE being used as frontline imaging for suspected type-A aortic dissection.

Aortic plaque is a clinically significant pathology that has been associated with otherwise unexplained embolic events. Risk factors for developing aortic plaque are similar to those associated with coronary artery disease.⁷ The imaging modality of choice to assess this lesion is TOE. Kalaris *et al.* reported a 7% incidence of aortic plaque in a study of 556 consecutive patients undergoing TOE.⁸ Vascular sonographers have reported the usefulness of echo contrast in detecting carotid atherosclerotic plaque,⁹ although its use in detecting plaque in the ascending aorta is not well documented.

This case highlights the potential benefits of third generation contrast to more accurately assess aortic pathology, including the ability to detect the presence of plaque. Currently the contrast agent is approved for “*improvement of left ventricular endocardial border delineation and assessment of regional wall motion at both rest and stress.*”¹ Further studies into the efficacy of contrast in the assessment of aortic pathology need to be conducted. These studies will likely expand the clinical indications for the use of third generation contrast.

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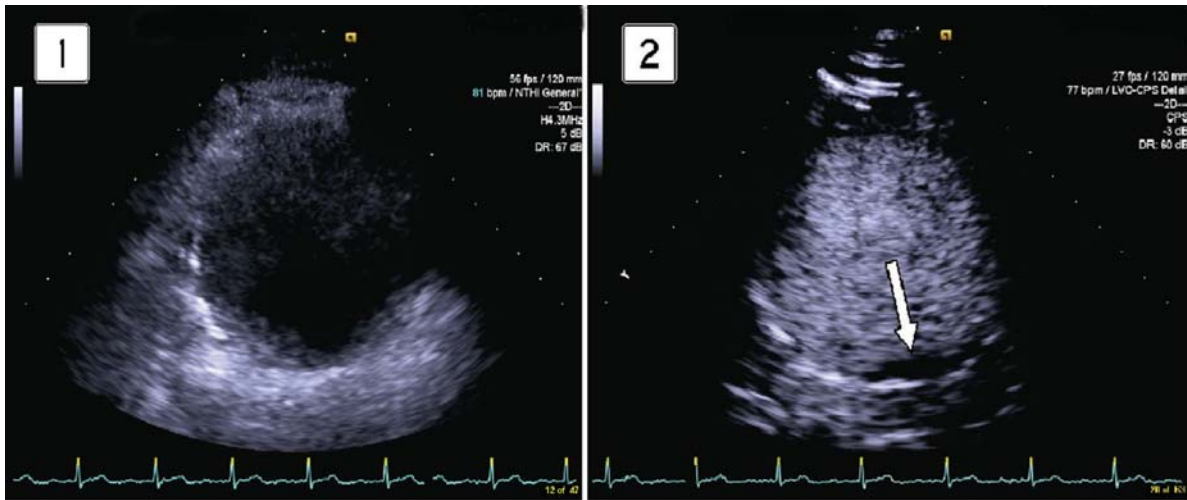


Figure 1: (1) 2D echo image of dilated ascending aorta from right sternal edge. (2) Contrast image of ascending aorta from right sternal edge. Plaque is demonstrated at 5-to-6 o'clock in the image.

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