



## IMAGE IN CARDIOLOGY

# Complications of myocardial infarction: Echocardiography for differential diagnosis of heart murmur<sup>☆</sup>



## Complicações de enfarte do miocárdio: ecocardiograma para diagnóstico diferencial de sopro cardíaco

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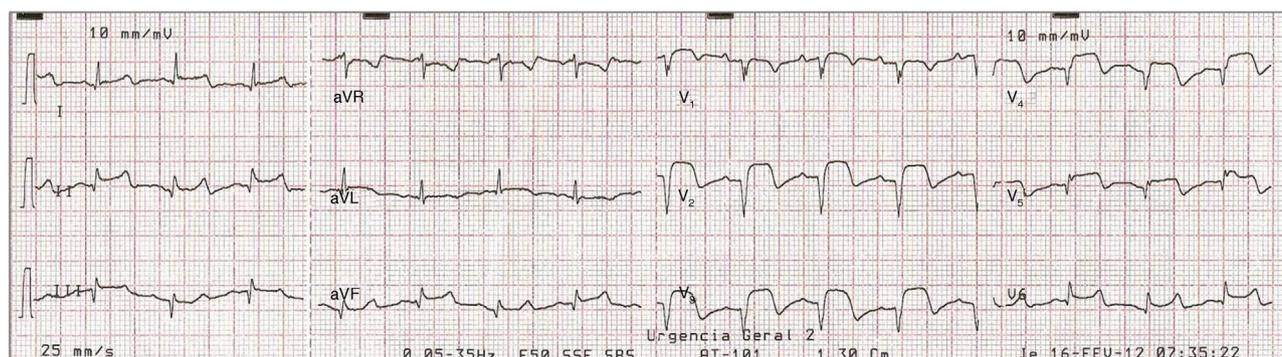
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Received 23 January 2015; accepted 15 June 2015

Available online 30 December 2015

A 74-year-old woman with type 2 diabetes was admitted with malaise and dyspnea for a week. On initial observation she was cooperative; subcrepitant rales were heard in both lung fields and the electrocardiogram showed Q waves

and ST-segment elevation in the precordial leads DII and DIII (Figure 1). She was diagnosed with subacute anterior myocardial infarction in Killip class III and coronary angiography was performed, followed by percutaneous coronary



**Figure 1** 12-lead electrocardiogram showing sinus rhythm, Q waves and ST-segment elevation in the precordial leads DII and DIII.

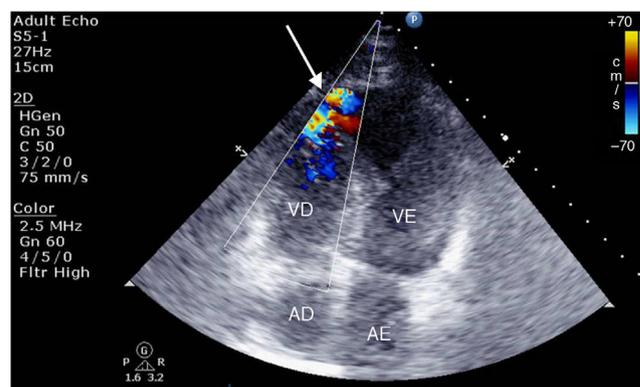
<sup>☆</sup> Please cite this article as: Cruz I, Caldeira D, Stuart B, Cotrim C, João I, Pereira H. Complicações de enfarte do miocárdio: ecocardiograma para diagnóstico diferencial de sopro cardíaco. Rev Port Cardiol. 2015;34:781-783.

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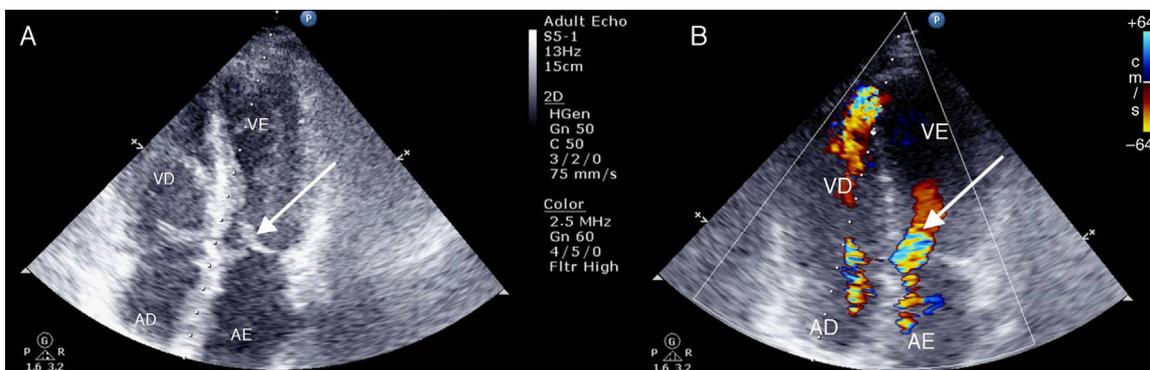
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intervention of the mid anterior descending artery with stent implantation. An intra-aortic balloon pump was placed to maintain hemodynamic stability and dobutamine infusion ( $7 \mu\text{g}/\text{kg}/\text{min}$ ) was begun.

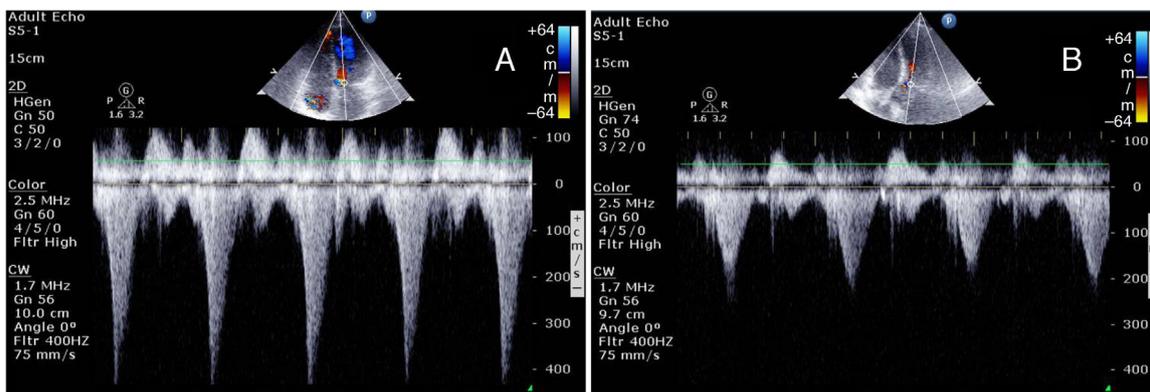
While in the coronary care unit she continued to experience malaise and faintness and her hypotension and oliguria worsened. On cardiac auscultation a grade III/VI holosystolic murmur was detected at the left sternal border, while the echocardiogram revealed akinesia of the apical segments and compensatory hypercontractility of the basal segments, with preserved global left ventricular (LV) systolic function, and a diagnosis was made of non-restrictive interventricular septal rupture (Figure 2). Turbulent flow was seen in the LV outflow tract, with a velocity of  $>4 \text{ m/s}$  and systolic anterior motion (SAM) of the anterior leaflet of the mitral valve (Figure 3). In view of LV outflow tract obstruction associated with hypotension, it was decided to discontinue dobutamine perfusion and to administer intravenous propranolol. This resulted in symptomatic improvement and increased blood pressure, and the echocardiogram showed less turbulent and slower flow and improvement of SAM (Figure 4). It was thus possible to stabilize the patient and



**Figure 2** Transthoracic echocardiogram showing turbulent apical flow (arrow) due to interventricular septal rupture (peak velocities on continuous Doppler  $<3 \text{ m/s}$ ). AD: right atrium; AE: left atrium; VD: right ventricle; VE: left ventricle.



**Figure 3** Transthoracic echocardiogram showing systolic anterior motion of the mitral valve (A, arrow), together with hypercontractility of the basal segments, causing dynamic obstruction of the left ventricular outflow tract, as demonstrated by turbulent flow in the outflow tract (B, arrow).



**Figure 4** Quantification of dynamic gradients in the left ventricular outflow tract before (A) and after (B) discontinuation of dobutamine and administration of intravenous propranolol ( $1 \text{ mg}/\text{kg}$ ). The peak gradient in (A) is  $>64 \text{ mmHg}$  with blood pressure of  $90/60 \text{ mmHg}$ ; in (B) the peak gradient has fallen to  $16 \text{ mmHg}$  and blood pressure has risen to  $110/70 \text{ mmHg}$ .

transfer her to a surgical center, but unfortunately she died of complications in the second week after surgery.

We highlight the importance of thorough assessment of possible complications of myocardial infarction through echocardiography, in order to determine the best therapeutic approach, which in this case was to avoid positive

inotropes and to use intravenous beta-blockers to reduce intraventricular obstruction.

### **Conflicts of interest**

The authors have no conflicts of interest to declare.