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Contrast Echocardiography and ST-Segment Elevation

Ecocardiografía de contraste y supradesnivel del segmento ST

To the Editor,

We present the case of a 53-year-old man, diagnosed with an anterior acute myocardial infarction treated with fibrinolysis, with natural killer T cells, presenting reperfusion criteria and a maximum creatine kinase value of 516 IU/L. For the exact

quantification of systolic function, contrast echocardiography was performed by the manual injection of a 0.5 mL bolus of SonoVue[®] in 5 mL of physiological saline over 30 s. Simpson's biplane method was used to measure left ventricular end-diastolic index (LVEDI; 168 mL/m²), left ventricular end-systolic index (LVESI; 115 mL/m²) and left ventricular ejection fraction (32%) (Fig. 1). Coronary angiography showed a 90%-99% lesion in the origin of the left anterior descending artery (LAD). There were no lesions of significance in the circumflex artery and a dominant right coronary artery. The LAD was treated using a Taxus[®] stent.

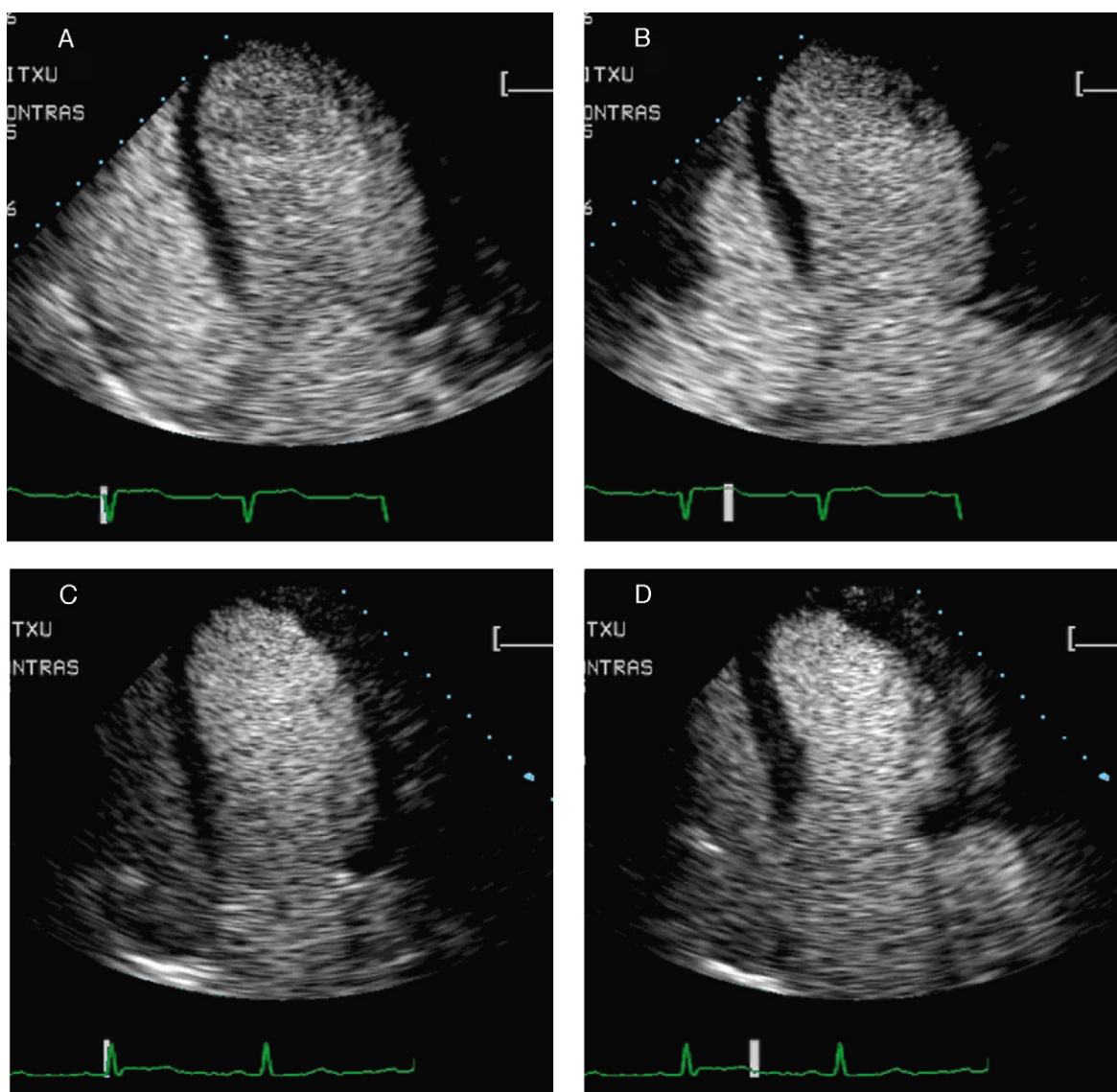


Figure 1. Left ventriculography in end-diastole and end-systole in the apical 4-chamber view during the hospital phase of acute myocardial infarction (A and B) and instants before the anaphylactic reaction (C and D).

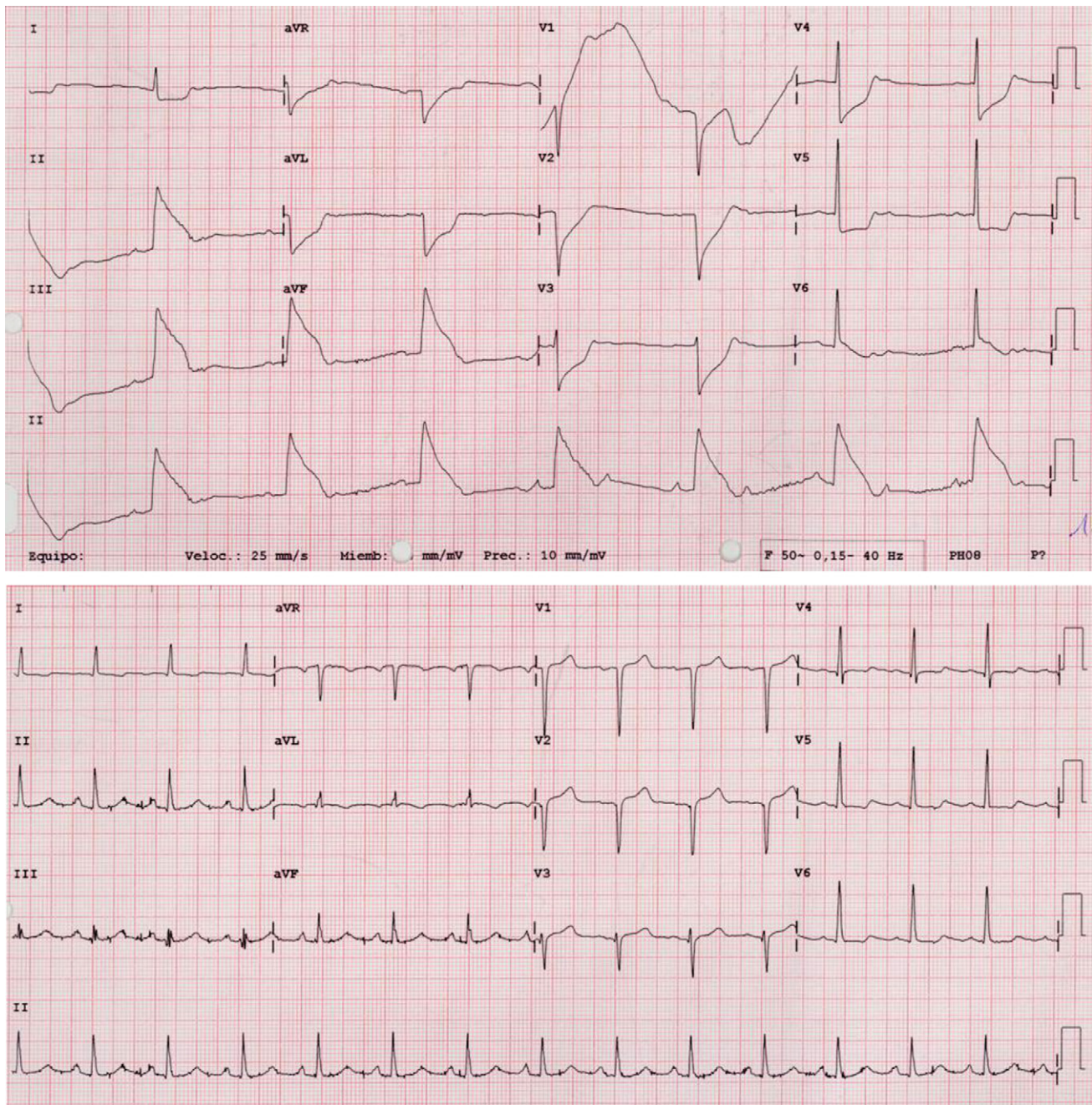


Figure 2. Electrocardiogram during the adverse reaction (upper) and after 20 min (lower).

The patient was asymptomatic with acetylsalicylic acid, clopidogrel, ramipril, carvedilol and atorvastatin and following examination at 11 weeks a second contrast echocardiography was performed. After the injection of the contrast agent the patient described having a bad taste in his mouth, irritation, discomfort and profuse sweating, and presented hypotension (50-60 mmHg) and bradycardia. Despite treatment with oxygen, atropine, high-dose actocortina and fluid therapy he developed QRS prolongation, ST-segment elevation in the inferior wall and AV block. Blood pressure and electrocardiogram returned to normal values within 20 min (Fig. 2). Immediate coronary angiography verified the absence of significant stenosis in the LAD, circumflex and right coronary arteries. Ventriculography with contrast echocardi-

graphy showed a reduction in ventricular dilatation (LVEDI, 119 mL/m²; LVESI, 61 mL/m²) and ejection fraction (49%) (Fig. 1). Within 6 h of the event, troponin T and creatine kinase values were normal.

The clinical picture, its temporal association with the contrast injection and previous contact were consistent with an anaphylactic reaction to SonoVue®. Pharmacovigilance studies have detected a severe adverse effects rate of 0.014%; 18 of 157 838 events were described as anaphylactic or vasovagal reactions. Three cases of fatal adverse effects have been described, although a cause-and-effect relationship between the deaths and the contrast agent has not been demonstrated.¹ Our group has performed more than 2000 contrast echocardiography studies and we have

observed 1 severe adverse reaction alone, although a 0.9% nonfatal shock rate in 352 consecutive patients during 4 years has been reported.²

Severe myocardial ischemia secondary to an anaphylactic reaction has been observed in patients with coronary arteries without lesions, and has been induced by circumstances as varied as eating shellfish, insect bites or the use of different drugs.³ Electrocardiographic findings (ST-segment depression in lead I together with ST-segment elevation in II, III, VF and ST-segment depression in precordial leads, but with mild elevation in V₆) and the absence of significant lesions in the coronary angiography suggest right coronary spasm before the AV node artery, but after the RV artery as the most probable mechanism of action. However, it cannot be ruled out that critical hypoperfusion due to the severe hypotension that always accompanies an anaphylactic reaction may have also contributed to the event. The main pathogenic mechanism by which anaphylactic reactions are linked to coronary ischemia is via the release and activation of vasoactive substances produced by mast cells in the human heart. Antispasmodic agents were not considered given that contrast agents will never again be used in this patient. The composition of the microbubble shell triggers the anaphylactic reaction rather than the gas core, and this may be the reason why some contrast agents cause more adverse effects than others.

Contrast echocardiography rather than conventional echocardiography is indispensable when quantifying volumes, since it provides the accuracy and reproducibility of cardiac magnetic resonance imaging. Safety studies support their general use, but

only providing staffing and technical requirements are met such that any adverse effect can be dealt with immediately and effectively.⁴

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Percutaneous Coronary Intervention Through an Axillo-Bifemoral Bypass

Intervención coronaria percutánea a través de puente axilobifemoral

To the Editor,

Use of radial access has increased spectacularly. At the time of writing, it is found in 45% of all percutaneous coronary interventions in Spain.¹ However, despite this, femoral access remains the most frequently used site in many catheterization laboratories. This is especially the case in North America and in patients in whom radial access cannot be canalized or when large caliber catheters are needed for complex procedures. We present the case of a patient with peripheral vascular disease and totally unsuitable for radial access who underwent coronary angiography and percutaneous intervention via a right axillo-femoral bypass.

A 61-year-old man with a history of smoking, high blood pressure, and hypercholesterolemia was admitted to a regional hospital with acute non-ST segment elevation coronary syndrome. In 2002, he had an aorto-bifemoral bypass for Leriche syndrome with juxta-renal obstruction of the aorta. Six years later he presented symptoms compatible with graft thrombosis. He was indicated for urgent arteriography and right branch thrombosis was confirmed. The patient received fibrinolysis, which was initially effective. However, when treatment ended he had another thrombotic episode leading to the decision for an urgent axillo-bifemoral bypass intervention that placed an 8 mm polytetrafluoroethylene (PTFE) prosthesis from the right axillary artery to the deep femoral artery. At the time, coronary angiography was

indicated at a regional hospital and the patient's clinical history showed the aorto-bifemoral bypass with no mention of the urgent axillo-femoral bypass. Echocardiography indicated normal ejection fraction. Radial access was attempted on both sides but the radial delivery catheter's hydrophilic guidewire could not advance.



Figure 1. Contrast injection in right axillary artery. The brachial artery can be seen on the left. The axillo-bifemoral graft is in the center of the photograph and the right mammary artery is to the right.