

## Alcohol Septal Ablation for Hypertrophic Obstructive Cardiomyopathy: Take Care With the Collaterals

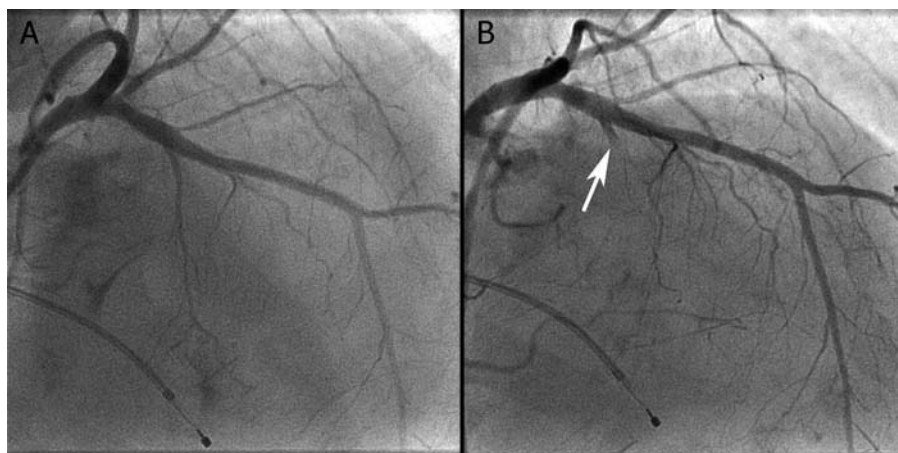
### To the Editor:

Percutaneous septal ablation (PSA) is an effective technique for treating selected patients with hypertrophic obstructive cardiomyopathy (HOCM).<sup>1</sup> The selective injection of alcohol in a septal branch produces localized necrosis in the basal ventricular septum, reducing the subaortic gradient, which improves symptoms in most cases. One of the most unfortunate complications with this technique is alcohol leaking into another area, which could cause a myocardial infarction with very serious consequences. This complication can arise due to incomplete occlusion of the septal branch with a balloon that is too small, or by the balloon rupture, sending alcohol toward the anterior descending artery (LAD).<sup>2</sup> In addition, the septal branch can irrigate myocardial areas other than the basal ventricular septum, and because of this it is important to use contrast echocardiography to observe the location of the area to be necrosed.<sup>1</sup> Another potential and lesser-known effect of alcohol passing to other areas is collateral recruitment from septal branches, as this case illustrates.

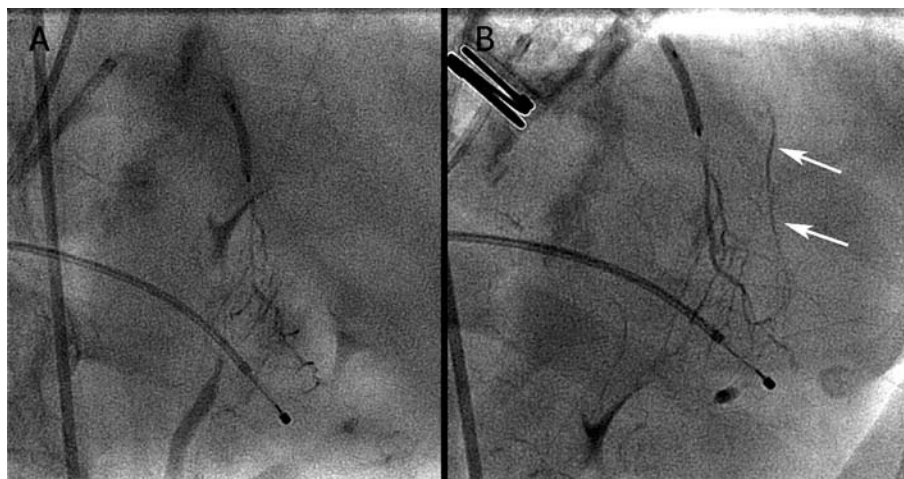
Patient aged 69 years, diagnosed with HOCM and being treated with beta-blockers, who was admitted in due to clinical worsening with dyspnoea and angina with small efforts. The echocardiogram showed a baseline subaortic gradient of 110 mm Hg and severe mitral insufficiency due to systolic anterior

displacement. The coronary angiogram ruled out significant coronary lesions (Figure 1A) and showed a well-developed first septal branch, for which reason we scheduled a PSA. After implantation of a temporary pacemaker, the first septal branch was cathetrized and occluded with a coaxial balloon measuring 2×15 mm. The echocardiography showed a baseline gradient of 100 mm Hg, and contrast was injected through the lumen of the coaxial balloon to show the location of the target zone in the basal ventricular septum. Radiology contrast was also injected (Figure 2A), and we observed no reflux toward the LAD. Next, 2 mL of pure alcohol was slowly injected through the inflated balloon, and the gradient was reduced to 20 mmHg, with development of right bundle branch block on the ECG. A contrast injection given 10 min later through the inflated balloon showed that contrast was passing from the first septal branch through collaterals (which had not been visible with the previous injection) and to the second septal branch, which was filled retrogradely toward its origin toward its origin (Figure 2B), although no contrast could be seen reaching the LAD. The procedure was completed following confirmation of complete occlusion of the first septal branch and normal flow in the LAD (Figure 1B). In-hospital evolution was uncomplicated and the patient was asymptomatic 6 months later, with the echocardiogram showing a maximum inducible gradient of 20 mm Hg.

Our case illustrates collateral recruitment in the septal branches during PSA, which could lead alcohol toward the LAD area. Their opening was probably induced by the ischemia caused during occlusion with the balloon and as a direct effect of the alcohol. This phenomenon has been described as



**Figure 1.** A: initial coronariography showing a well-developed first septal branch. B: result following percutaneous septal ablation, with total occlusion of the septal branch (arrow) and a normal flow in the descending anterior artery.



**Figure 2.** A: contrast injection in the first septal branch prior to percutaneous septal ablation. B: new injection following administration of alcohol, by which we observe collateral branches communication the first septal with the second septal (arrows), which is filling up retrogressively.

a cause of apical infarction during PSA<sup>3,4</sup> and could possibly also produce a inferior infarction because of communication between the septal and the descending posterior artery.<sup>5</sup> The study by Delgado et al<sup>6</sup> describes a non-complicated inferior infarction related to this procedure, which could have been related with collaterals of this type. If collateral recruitment is detected, it is important to avoid a second alcohol injection, or use a second balloon to occlude the branch into which the collaterals lead to avoid alcohol reaching the LAD.<sup>7</sup>

Collateral recruitment in the septal branch is a phenomenon that can arise during PSA. We must stress that in the event of using several alcohol injections, it is important to rule out collaterals opening up by first injecting contrast, in order to avoid the complications arising from alcohol passing toward another myocardial area.

Santiago Jiménez Valero, Raúl Moreno,  
Guillermo Galeote, and Ángel Sánchez-Recalde  
Departamento de Hemodinámica y Cardiología Intervencionista.  
Servicio de Cardiología, Hospital La Paz, Madrid, Spain.

## REFERENCES

1. Knight CJ. Alcohol septal ablation for obstructive hypertrophic cardiomyopathy. *Heart*. 2006;92:1339-44.
2. Antolinos MJ, De la Morena G, Gimeno JR, Cerdán MC, Hurtado JA, Valdés M. Rotura de balón y extravasación de alcohol hacia la arteria descendente anterior durante la ablación septal en paciente con miocardiopatía hipertrófica obstructiva. *Rev Esp Cardiol*. 2005;58:872-4.
3. Agarwal SC, Purcell IF, Furniss SS. Apical myocardial injury caused by collateralisation of a septal artery during ethanol septal ablation. *Heart*. 2005;91:e2.
4. Parham WA, Kern MJ. Apical infarct via septal collateralization complicating transluminal alcohol septal ablation for hypertrophic cardiomyopathy. *Catheter Cardiovasc Interv*. 2003;60:208-11.

5. Chowdhary S, Galiwango P, Woo A, Schwartz L. Inferior infarction following alcohol septal ablation: a consequence of "collateral damage"? *Catheter Cardiovasc Interv*. 2007;69:236-42.
6. Delgado V, Sitges M, Andrea R, Rivera S, Masotti M, Francino A, et al. Seguimiento clínico y ecocardiográfico de pacientes con miocardiopatía hipertrófica obstructiva tratados con ablación septal percutánea. *Rev Esp Cardiol*. 2006;59:1123-30.
7. Rigopoulos A, Sepp R, Palinkas A, Ungi I, Kremastinos DT, Seggewiss H. Alcohol septal ablation for hypertrophic obstructive cardiomyopathy: collateral vessel communication between septal branches. *Int J Cardiol*. 2006;113:e67-9.