ESC European Society of Cardiology

European Heart Journal - Case Reports (2018) **2**, 1–3
doi:10.1093/ehjcr/yty010

Alcohol septal ablation using myocardial contrast echocardiography on a patient with iodine contrast allergy

Sachiyo Ikuta, Shunsuke Kubo, Akimune Kuwayama, and Kazushige Kadota*

Department of Cardiology, Kurashiki Central Hospital, 1-1-1 Miwa, Kurashiki 710-8602, Japan

Received 29 September 2017; accepted 6 January 2018; online publish-ahead-of-print 21 March 2018

A 76-year-old woman was referred to our hospital for the management of symptomatic and drug-refractory hypertrophic obstructive cardiomyopathy. She remained symptomatic despite the daily medical treatment using 20 mg of carvedilol, 120 mg of verapamil, and 300 mg of disopyramide. Transthoracic echocardiography showed left ventricular outflow tract (LVOT) obstruction with a peak systolic pressure gradient of 64 mmHg at rest and moderate to severe mitral regurgitation caused by systolic anterior motion. The septal wall thickness, left ventricular diastolic/systolic diameters, and E/e' was 18 mm, 38/11 mm, and 27, respectively. We decided to perform alcohol septal ablation. During left coronary angiography (*Figure 1A*), she went into anaphylactic shock to an iodinated contrast medium. We therefore changed the treatment method and performed alcohol septal ablation using myocardial contrast echocardiography instead of coronary angiography. Cardiac catheterization revealed the maximum LVOT pressure gradient of 66 mmHg. A guidewire was passed into the first septal branch (SB), which was confirmed by intravascular ultrasound imaging (*Figure 1B*). A 1.5-mm over-the-wire balloon was advanced to the first SB and was inflated. To confirm the target myocardial area in the first SB, myocardial contrast echocardiography was performed by injecting 2.4 μL of Sonazoid® (Daiichi Sankyo, Tokyo, Japan) into the first SB. Transthoracic echocardiography showed the enhancement of the basal septum (*Figure 1C*). Then, 1 mL of ethanol was injected to the first SB, and a part of the septum highlighted by Sonazoid® was ablated (*Figure 1D*). After the first ablation, the LVOT pressure gradient decreased to 19 mmHg. In order to consolidate the results of the procedure and possibly improve its long-term results, we decided to perform the second ablation to further decrease the pressure gradient. A guidewire and a 1.5-mm balloon were advanced to the second SB by using intravascular ultrasound imaging (*Figure 2A* and *B*). After balloon occlusion, Sonazoid® was injected into the second SB (*Figure 2C, green arrows*). Subsequently, ethanol was injected into the second SB (*Figure 2D, green arrowheads*), and the LVOT pressure gradient was decreased to 12 mmHg (*Figure 2E*) with mild to moderate mitral regurgitation. Iodinated contrast media were not required during the procedure, and the patient was uneventfully discharged. She remains free of symptoms at 5 months after follow-up, and the same doses of preprocedural medications were continued.

In the alcohol septal ablation procedure, coronary angiography using an iodinated contrast medium is required to identify SBs and avoid alcohol injection for left anterior descending artery.[3] In this case, use of an iodinated contrast medium was prohibited in the second procedure. Thus, SBs were identified with an intravascular ultrasound guidance and the target myocardium area was confirmed by using myocardial contrast echocardiography because

* Corresponding author. Tel: +81-86-422-0210, Fax: +81-422-9351, Email: si14375@kchnet.or.jp. This case report was reviewed by Sabiha Gati, Francesco Lo Iudice, and Riccardo Liga.

© The Author(s) 2018. Published by Oxford University Press on behalf of the European Society of Cardiology.
This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (http://creativecommons.org/licenses/by-nc/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

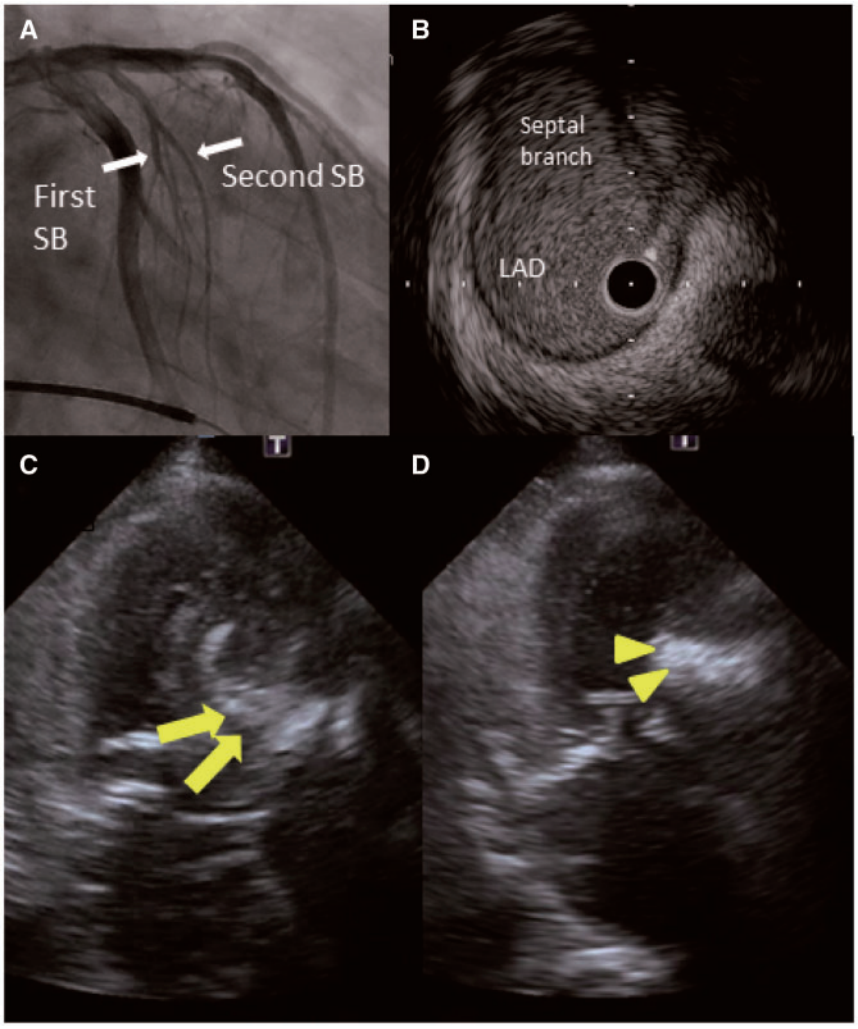

Figure 1 Left coronary angiography at the time of anaphylactic shock identified two septal branches (first and second septal branches) as target arteries for alcohol septal ablation (white arrows) (*A*). Intravascular ultrasound imaging was used to confirm the locations of the septal branches (*B*). Transthoracic echocardiography revealed a highlighted basal septum after intracoronary injection of Sonazoid® into the first septal branch (yellow arrows) (*C*). Ethanol was injected into the first septal branch, and a part of the septum highlighted by Sonazoid® injection was ablated (yellow arrow heads) (*D*). SB, septal branch; LAD, left anterior descending.

intra-procedural myocardial contrast echocardiography has been shown to be helpful for target vessel selection.[2] Our case indicates that alcohol septal ablation can be performed successfully with combined use of intravascular ultrasound and myocardial contrast echocardiography without iodinated contrast medium in patients with a proven anatomy of the left coronary artery. The current European Society of Cardiology guideline describes the utility of myocardial contrast echocardiography prior to alcohol injection in combination with coronary angiography and transthoracic echocardiography.[4] The complexity of alcohol septal ablation requires a multi-disciplinary approach between imaging team and interventionist given the considerable variation in vessel size, coronary morphology, and supplying territory.

Consent: The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

Conflict of interest: none declared.

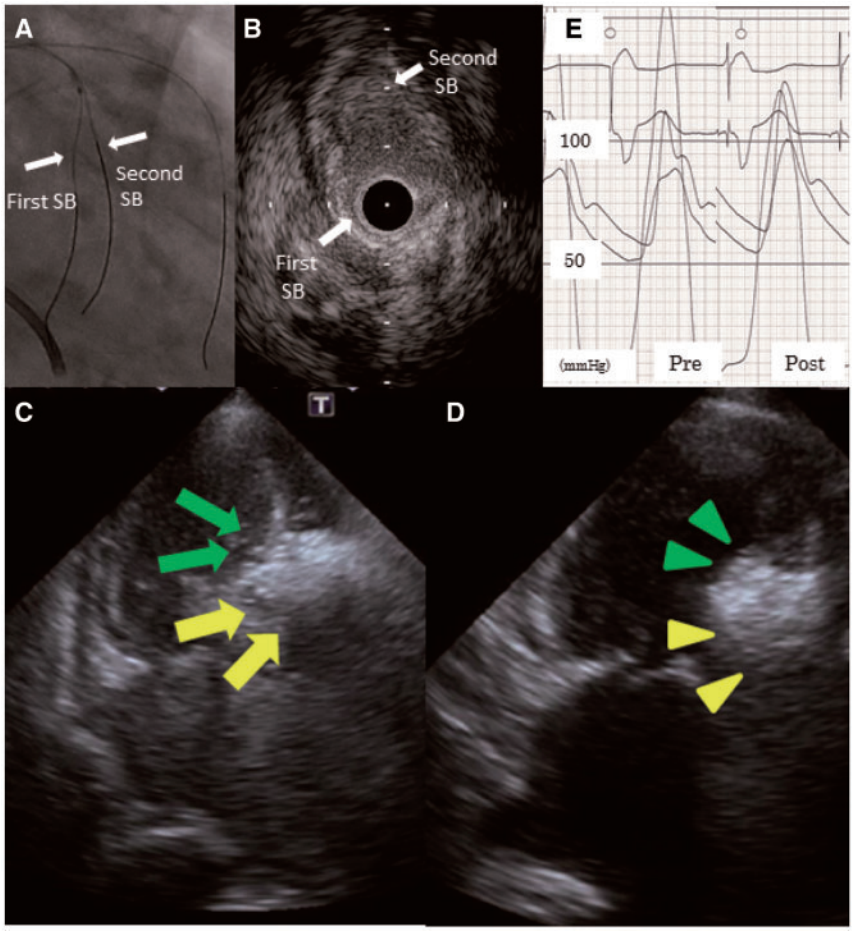

Figure 2 A guidewire and a 1.5-mm balloon were advanced to the second septal branch (*A*). Intravascular ultrasound imaging was used to confirm the location of the second septal branch (*B*). After the injection of Sonazoid® into the second septal branch, the part next to the firstly ablated septum was also highlighted (green allows) (*C*). Septal ablation was performed after the injection of ethanol into the second septal branch (green allow heads) (*D*). The left ventricular outflow tract pressure gradient improved from 66 mmHg to 12 mmHg (*E*). SB, septal branch.

References

1. Faber L, Ziemssen P, Seggewiss H. Targeting percutaneous transluminal septal ablation for hypertrophic obstructive cardiomyopathy by intraprocedural echocardiographic monitoring. *J Am Soc Echocardiogr* 2000;**13**:1074–1079.
2. Faber L, Seggewiss H, Welge D, Fassbender D, Schmidt HK, Gleichmann U, Horstkotte D. Echo-guided percutaneous septal ablation for symptomatic hypertrophic obstructive cardiomyopathy: 7 years of experience. *Eur J Echocardiogr* 2004;**5**:347–355.
3. Ruzyłło W, Chojnowska L, Demkow M, Witkowski A, Kúsmierczyk-Droszcz B, Piotrowski W, Rausinska L, Karcz M, Małecka L, Rydlewska-Sadowska W. Left ventricular outflow tract gradient decrease with non-surgical myocardial reduction improves exercise capacity in patients with hypertrophic obstructive cardiomyopathy. *Eur Heart J* 2000;**21**:770–777.
4. Elliott PM, Anastasakis A, Borger MA, Borggrefe M, Cecchi F, Charron P, Hagege AA, Lafont A, Limongelli G, Mahrholdt H, McKenna WJ, Mogensen J, Nihoyannopoulos P, Nistri S, Pieper PG, Pieske B, Rapezzi C, Rutten FH, Tillmanns C, Watkins H. 2014 ESC Guidelines on diagnosis and management of hypertrophic cardiomyopathy: the Task Force for the Diagnosis and Management of Hypertrophic Cardiomyopathy of the European Society of Cardiology (ESC). *Eur Heart J* 2014;**35**:2733–2779.