Kardiologia Polska 2016; 74, 7: 700; DOI: 10.5603/KP.2016.0103 ISSN 0022–9032

STUDIUM PRZYPADKU / *CLINICAL VIGNETTE*

Endocardial radiofrequency ablation for septal hypertrophy

Ablacja przerośniętej przegrody międzykomorowej prądem o wysokiej częstotliwości

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Endocardial radiofrequency ablation of septal hypertrophy (ERASH) might be a potentially attractive treatment concept of symptomatic hypertrophic obstructive cardiomyopathy (HOCM). However, very few studies have been reported on such treatment. We present the immediate results and 2-year follow-up observation after ERASH. A 47-year-old male HOCM patient, after insertion of dual-chamber implantable cardioverter-defibrillator, with paroxysmal atrial fibrillation, in functional class New York Heart Association (NYHA) III despite optimal medical therapy, was referred for further treatment. Cardiac magnetic resonance revealed 31-mm-thick asymmetric hypertrophy of the basal septal segment (Fig. 1A, B), systolic anterior motion of the mitral valve leaflet with secondary mild mitral regurgitation, and extensive late gadolinium enhancement mostly in the hypertrophied segments. Maximal left ventricular outlet tract obstruction (LVOTO) gradient at rest was 47 mm Hg by continuous wave (CW) Doppler echocardiography and 60 mm Hg at rest in direct invasive measurement, and reached 160 mm Hg after premature ventricular contraction. Suboptimal septal branch anatomy excluded septal alcohol ablation (Fig. 1C, D). As the patient preferred a less invasive approach, ERASH was offered. After transseptal puncture, an ablation catheter was introduced into the left atrium and via mitral annulus into the left ventricle. CARTO-based three-dimensional electro-anatomical mapping of both ventricles was performed. A series of 11 radiofrequency pulses to the septal bulge was delivered from both the left and right ventricles. Direct postprocedural LVOTO gradient decreased to 15 mm Hg. Maximal troponin-I rise was 12 ng/mL (UNL < 0.03 ng/mL). On the seventh postprocedural day reduction of maximal LVOTO gradient to 27 mm Hg was noted by CW Doppler. N-terminal pro-B-type natriuretic peptide (NT-proBNP) decreased from 950 pg/mL to 590 pg/mL. Peak oxygen uptake was 19.7 mL/min/kg (50% of predicted normal value) by cardiopulmonary exercise testing (CPX). At 2-year follow-up the patient remained in functional class NYHA I/II. The maximal CW Doppler LVOTO gradient was 49 mm Hg and during Valsalva rose up to 68 mm Hg. Peak oxygen uptake was 21.4 mL/min/kg (55% of predicted normal value). NT-pro-BNP fluctuated from 1005 pg/mL to 490 pg/mL. However, at 3-year follow-up CW Doppler LVOTO gradient rose to 80 mm Hg at rest. Thus, surgical myectomy together with mitral valve replacement to artificial prosthesis was performed. We failed to show convincing LVOTO gradient reduction in our patient. Despite this, improvement of symptoms was observed and confirmed in objective tests (CPX). Some procedural details should be raised. First, the mean septal thickness in the study by Lawrenz et al. (J Am Coll Cardiol, 2011; 57: 572–576) was 22.5 mm, as opposite to 31 mm in our patient. A thicker septum may limit the ERASH effectiveness. Secondly, the ablation site in that study was either left or right ventricle, and nobody received both ventricle-sided ablation. No differences on LVOTO reduction between left-sided and right-sided ablation were observed and one-side ventricle septum ablation versus both-sides septum ablation was not tested. One may hypothesize that deeper the ablation, higher the risk of conduction system damage. Thus, the aim of our treatment strategy to perform ablation on both ventricle sites was to increase the ablated thickness without deep ablation penetration. ERASH seems to be an attractive catheter-based treatment concept for HOCM patients irrespective of septal vasculature. Although we observed clinical improvement, lack of convincing, long-term LVOTO reduction does not allow us to recommend this treatment approach and warrants further development of dedicated ERASH catheters.

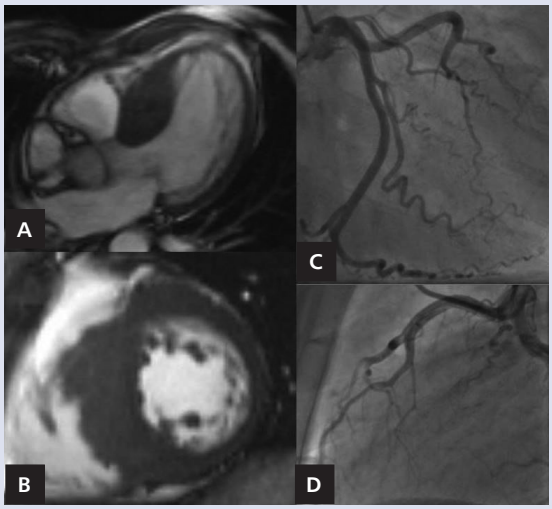

Figure 1. **A**, **B**. Cardiac magnetic resonance showing excessive hypertrophy of the basal septum in long-axis projection and short-axis view, respectively; **C**, **D**. Angiography of the left coronary artery and the left anterior descending coronary artery, respectively

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Conflict of interest: *none declared*