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Echocardiographic assessment of right ventricular outflow tract obstruction in hypertrophic cardiomyopathy - efficacy of dual chamber pacing in reducing of gradient.

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Topic(s):
Imaging: Myocardial Disease

Citation:
Hypertrophy of the right ventricle (RV) in the course of hypertrophic cardiomyopathy (HCM) is found in 30-60% of cases, with the possibility of a right ventricular outflow tract obstruction (RVOTO), obstruction in the apex or the middle part of the right ventricle.

A patient, aged 41, admitted due to limitation of exercise tolerance, effort dyspnea, presyncope. In an echocardiogram, interventricular septum (IVS) hypertrophy was observed up to 2.0 cm; normal size of the heart cavities; normal left ventricular systolic function (EF-70%). A color doppler mapping detected the zone of flow acceleraction and turbulent flow in right ventricular outflow tract (RVOT), next a spectral doppler examination showed the RVOT obstruction with a maximal gradient of 64 mmHg. Because of the suboptimal echocardiographic imaging, a heart CT scan was performed, revealing the features of left ventricular hypertrophy, most severe at the base and the medium part of IVS (up to 25 mm). Asymmetric hypertrophy of the middle portion of the right ventricle and right ventricular outflow tract obstruction was also observed. A hemodynamic study confirmed the presence of gradient in RVOT, up to 40 mmHg. Holter electrocardiogram recorded an episode of non-sustained ventricular tachycardia. Taking into account the clinical picture, the family history of the disease, and calculated HCM Risk SCD (7.55%), the decision was made to implant a dual chamber cardioverter defibrillator. The defibrillator electrode was fixed at the apex of the right ventricle. A short AV delay was programmed for prevalent right ventricular stimulation (AV delay 100 ms), resulting in 99.6% ventricular stimulation. The control echocardiogram showed a reduction in the maximum gradient in RVOT to 24 mmHg. In addition, the patient was treated with a beta-blocker.

To sum up, in the case of HCM we should always examine the RV with color and spectral doppler to exclude potential narrowing in RV.

Constant AV sequential stimulation with a short AV delay is a recognized method that can be considered in symptomatic adult HCM patients with a left ventricular outflow tract obstruction. In the case described here, the above mentioned method proved effective in the significant reduction of the gradient in the right ventricular outflow tract.
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To sum up, in the case of HCM we should always examine the RV with color and spectral doppler to exclude potential narrowing in RV. Constant AV sequential stimulation with a short AV delay is a recognized method that can be considered in symptomatic adult HCM patients with a left ventricular outflow tract obstruction. In the case described here, the above mentioned method proved effective in the significant reduction of the gradient in the right ventricular outflow tract.