Successful Coronary Vein Lead Implantation by Intravascular Ultrasound Guidance in a Patient with Life-Threatening Contrast Medium Anaphylaxis

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Introduction: A 51 years old male with dilated phase of hypertrophic cardiomyopathy was referred for severe heart failure management. Cardiac resynchronization therapy (CRT) was indicated due to 132ms of QRS duration, 25% of left ventricular ejection fraction and NYHA class III heart failure symptom. However, the patient had a past history of life-threatening contrast medium anaphylaxis with urticarial rash and erosion on skin and oral mucous during contrast-enhanced computed tomography. Therefore, the use of contrast agent was considered as contraindication, and then, we planned a coronary vein (CV) lead implantation under the guidance of intravascular ultrasound (IVUS), described as follows.

Methods: (1) A guiding catheter cannulation into the main CV was performed by intracardiac electrogram guidance with a 6Fr decapolar electrode catheter (Inquiry, Abbott, IL, USA). (2) A 0.014-inch guide wire was advanced into the anterior intervenetricular vein, and an IVUS catheter (EAGLE EYE, Volcano, San Diego, CA, USA) was deployed over the wire. The IVUS imaging revealed an antero-lateral CV branch (AL), and the location of the bifurcation was also confirmed on the fluoroscopic image. (3) The guide wire was successfully advanced into the AL branch, and reached to the main CV via a postero-lateral branch (PL). Although two CV branches (AL and PL) were confirmed, AL seemed too small for CV lead placement. (4) After the guide wire advancement into the PL, the IVUS revealed approximately 34.5 mm length and 2.0-3.8 mm diameter of the PL (Figure). (5) A decapolar electrode catheter was placed using inner catheter into the PL, and acceptable pacing threshold without phrenic nerve stimulation was obtained within the PL. The intracardiac electrogram revealed reasonable electrical activation latency with 106 ms of Q-LV interval. (6) Finally, a quadripolar CV lead (4674, AcuityX4 spiral S, Boston, Minneapolis, MN, USA) was successfully placed at the latest activation site.

Result: Two months after the successful CRT implantation, echocardiography showed a decreased left ventricular end-systolic volume greater than 15%, as a definition of mechanical CRT responder.

Conclusion: A CV lead implantation by IVUS guidance can be a useful solution for patients with contrast medium anaphylaxis.