

IMAGE

Coronary Sinus Stenting to Enable Left Ventricular Lead Implantation During Cardiac Resynchronization Therapy: A Case Report

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A 63-year-old female patient with a history of ischemic cardiomyopathy presented to the outpatient cardiology clinic with dyspnea, fatigue, and reduced exercise capacity. Her symptoms were classified as New York Heart Association (NYHA) functional class IV despite optimal medical therapy. A 12-lead electrocardiogram demonstrated sinus rhythm with left bundle branch block (LBBB) and a QRS duration of 158 ms. Transthoracic echocardiography revealed a left ventricular (LV) ejection fraction of 30%, global hypokinesia, and left ventricular chamber dilatation.

We have planned cardiac resynchronization therapy (CRT) implantation. Using left subclavian venous access, right ventricle (RV) lead (Plexa ProMRI S 65, Biotronik) has inserted into the RV apex. Subsequently coronary sinus (CS) delivery system (Selectra Hook-45, Biotronik) was introduced into CS. CS venography revealed a critical stenosis on the posterolateral branch (Figure 1a). A 0.014-inch guidewire inserted into posterolateral branch and then LV lead (Sentus ProMRI OTW QP L-85/49, Biotronik) advanced via inner (Selectra IC-90-59, Biotronik) however the stenosis could not be crossed. Since there was no other suitable target, balloon angioplasty was performed, then 2.5x12 mm DES (PROMUS Premier™ Select, Boston Scientific) was implanted in the posterolateral vein (Figure 1b). After stenting, LV lead implantation was accomplished with a pacing threshold of 1.9 V and impedance of 578 Ω (Figure 1c). Finally, right atrial lead (Solia S 53, Biotronik) has inserted into the right atrial appendage and the procedure was completed successfully without any complication (Supplementary Video). After the procedure, the patient was monitored for 24 hours, and the control ECG showed QRS narrowing to 144 ms. The patient was administered dual antiplatelet therapy (DAPT) one month after the procedure. At the outpatient clinic evaluation one month later, the patient showed symptomatic improvement with functional capacity classified as NYHA class II.

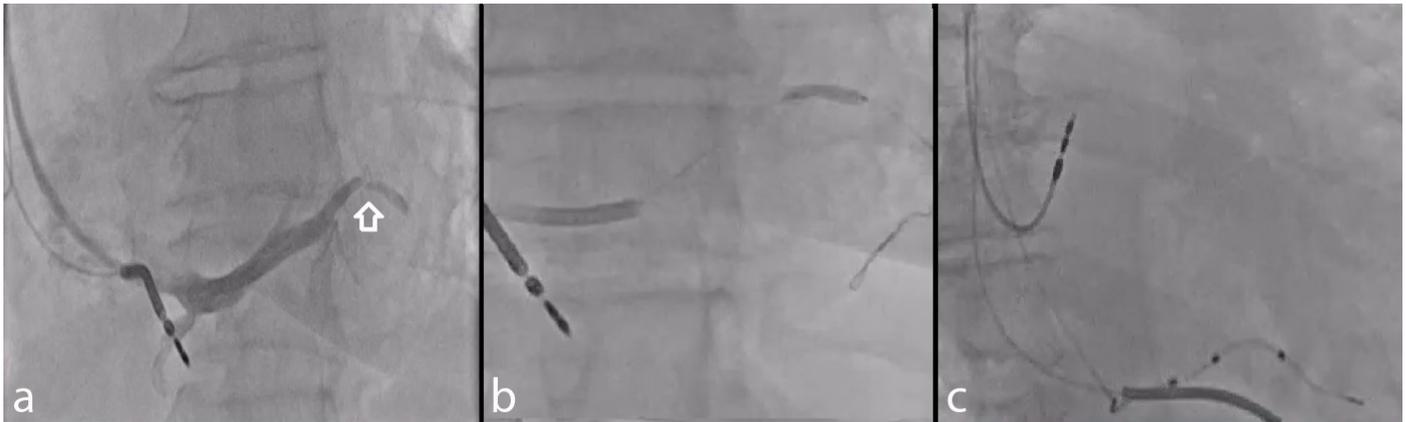


Figure 1. CS venography revealing a critical stenosis (white arrow) in a posterolateral branch (a). 0.014 guidewire inserting into posterolateral branch and stent implantation in the stenosed segment (b). Final position of the LV lead (c).

CRT is a safe and effective treatment option in selected heart failure patients with unresponsive to medical treatment and intraventricular conduction disease. The effectiveness of CRT depends on many factors including etiology, gender, CS anatomy and final LV lead positioning.^{1,2} Anatomical hindrances such as stenosis or tortuosity in the CS network are the main challenges for the operator to achieve and maintain optimal lead position. In these situations, balloon angioplasty or/and stenting of CS branches appear to safe and effective methods for LV lead placement.^{3,4,5} Bare metal stents are generally preferred in CS stenosis; however, we preferred to use DES, considering lesion complexity and some advantages of DES, such as superior radial strength, sustainable lumen patency, and anticipated reduction in stent restenosis and recoil-we preferred to use DES. Besides that, our patient had a low bleeding risk; nonetheless, a longer term of DAPT was not required due to the short stent segment and venous low-flow status. In our case, we have successfully accomplished CRT implantation with DES stenting of the posterolateral branch of CS.

Conduction system pacing (CSP), including His bundle pacing and left bundle branch area pacing, should be considered as an alternative method in such cases. These contemporary strategies provide physiological biventricular activation and achieve resynchronization without relying on the coronary sinus. CSP could be a primary strategy or bailout option when CS anatomy impedes LV lead replacement.⁶

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Informed consent

Written informed consent was obtained from the patient for the publication of the manuscript.

Conflict of Interests

None

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