Coronary sinus reducer implantation in patients with refractory angina: first experience in Poland

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Refractory angina has become an important clinical condition, as it affects up to 15% of patients with severe ischemic heart disease.[1] Moreover, up to 25% of patients complain of severe residual angina 1 year after successful revascularization procedures.[2] Until recently, classical anti-ischemic drugs were the only available treatment option for this growing population. Lately, several novel therapeutic options such as external counterpulsation, spinal cord modulation, and coronary sinus reducer (CSR) implantation emerged for patients with refractory angina persisting despite optimal revascularization and pharmacological treatment.

A CSR is an hourglass-shaped device (FIGURE 1A) implanted percutaneously in the coronary sinus (CS), causing a focal narrowing. This results in increased coronary venous pressure and redistribution of blood flow from the subepicardium to the ischemic subendocardium, thus reducing ischemia and relieving anginal symptoms.[3] The safety and efficacy of CSRs in limiting symptoms of angina were shown in a cornerstone COSIRA (Efficacy of a Device to Narrow the Coronary Sinus in Refractory Angina) trial and numerous registries.[4,5]

Here, we report the results of the 2 first CSR implantation procedures performed in Poland. The first patient was a 67-year-old man who underwent coronary artery bypass grafting in 2005 and multiple percutaneous coronary interventions afterwards. The latest coronary angiography results demonstrated extensive disease in native coronaries, 2 occluded grafts (to obtuse marginal and intermediate arteries), and patent grafts to the right coronary artery (RCA) and the left anterior descending artery. Despite extensive pharmacological treatment, the patient suffered from refractory angina in Canadian Cardiovascular Society (CCS) class III. The second patient was a 68-year-old man after coronary artery bypass grafting performed in 2007, with all grafts patent (left anterior descending artery, RCA, and obtuse marginal artery) and the occluded left main and RCA. Due to residual angina in CCS class III, he underwent multiple attempts of percutaneous coronary intervention to the left main, all of which were unsuccessful. Both patients had evidence of reversible ischemia on imaging and were deemed ineligible for further revascularization attempts by the local Heart Team.

Both procedures were performed in a similar fashion by WK and WZ, under external proctoring. Vascular access was obtained via the right jugular vein under ultrasound guidance. A 6F diagnostic catheter (Judkins left 1) was used to measure right atrial pressure, then selectively engage the CS, and perform its angiography (FIGURE 1B). Afterwards, the catheter was changed to a 9F guiding catheter over a stiff wire. This enabled CSR positioning in the targeted implantation site proximally in the CS. After catheter retraction, the device was deployed by low-pressure (2–4 atm) balloon implantation (FIGURE 1C). After balloon deflation and retraction, follow-up angiography was performed to exclude possible complications (CS dissection or perforation) (FIGURE 1D). In both cases, procedures were free of complications and the patients were discharged home after follow-up echocardiography on the next day. Dual antiplatelet therapy was prescribed for 6 months (as recommended in the COSIRA trial). The patients underwent a telephone (due to pandemic restrictions) follow-up after 3 months. Both of them reported improvement in physical activity and reduction of

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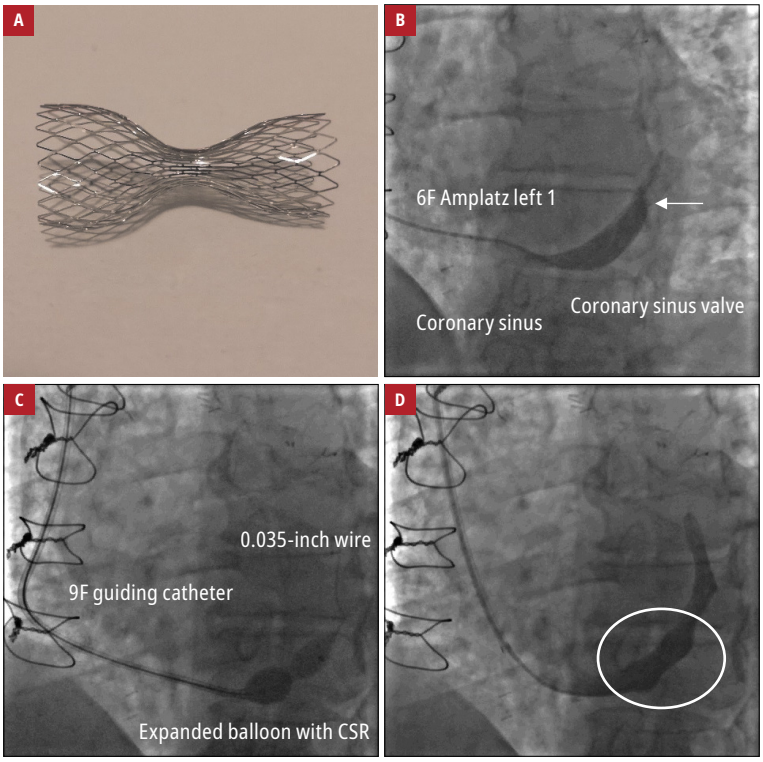

FIGURE 1 **A** – coronary sinus reducer (CSR); **B** – coronary sinus angiography visualizing the coronary sinus valve (arrow); **C** – CSR implantation; **D** – final angiography showing the CSR in the target location (circle)

symptoms (CCS class I). These observations were confirmed by a significant increase in the Seattle Angina Questionnaire results (from 51 to 88 points and from 58 to 78 points).

In summary, early evidence and limited experience show that CSR implantation is a safe procedure and may be a valid treatment option for patients with refractory angina.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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