

# Transradial Percutaneous Coronary Intervention in a Patient with a Rare Coronary Anomaly: Twin Circumflex Arteries

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Coronary artery anomalies are rare in population and most of them are found incidentally during coronary angiography. Percutaneous treatment of critical lesions on anomalous arteries may lead to difficulties due to their abnormal origin or course. Herein, we report a 65-year-old male patient presented with recent onset chest pain. Electrocardiogram and transthoracic echocardiography were in normal range. Treadmill exercise test revealed ST segment depression in lead V<sub>4</sub>-V<sub>6</sub>. Angiography revealed an unusual coronary anomaly: twin circumflex arteries originating from left main coronary artery and same orifice of right coronary artery, respectively. There was a significant stenosis on the right sided circumflex artery, which was treated percutaneously via transradial access.

**Key Words:** Coronary artery anomalies • Percutaneous coronary intervention • Transradial access • Twin circumflex arteries

## INTRODUCTION

Coronary artery anomalies are uncommon, with an incidence of about 1% as shown in various series.<sup>1,2</sup> One of the most common coronary anomalies is a circumflex (Cx) coronary artery anomalously originating from the right sinus of Valsalva; however double Cx arteries originating from the left and right coronary system is a type of anomaly rarely reported in the literature.<sup>3-8</sup> Herein, we report twin Cx coronary arteries originating from the left main coronary artery (LMCA) and right coronary artery (RCA). We performed percutaneous coronary intervention (PCI) for anomalous artery stenosis via transradial access.

## CASE REPORT

A 65-year-old male patient was admitted to our hospital for evaluation of recent onset typical chest pain. His risk factors for coronary artery disease included hypertension and smoking. His physical examination was unremarkable, and a resting electrocardiogram which was administered was normal as well. Transthoracic echocardiography showed normal left and right ventricular dimensions and functions. The patient underwent a treadmill exercise which was performed according to the Bruce protocol, and showed a downward sloping ST-segment depression by two millimeters in lead V<sub>4</sub>-V<sub>6</sub>. The patient's coronary angiography (CAG) was performed through the right radial artery and revealed a double Cx: one of them (left Cx) originating from LMCA (Figure 1A) and the other (right Cx) taking off from the same orifice of RCA (Figure 1B). There was no critical stenosis observed on the left anterior descending artery, RCA or left CX artery, but 80% stenosis on the proximal portion of the anomalous right Cx artery was detected. Therefore, we planned to do PCI on the lesion at the proximal right Cx.

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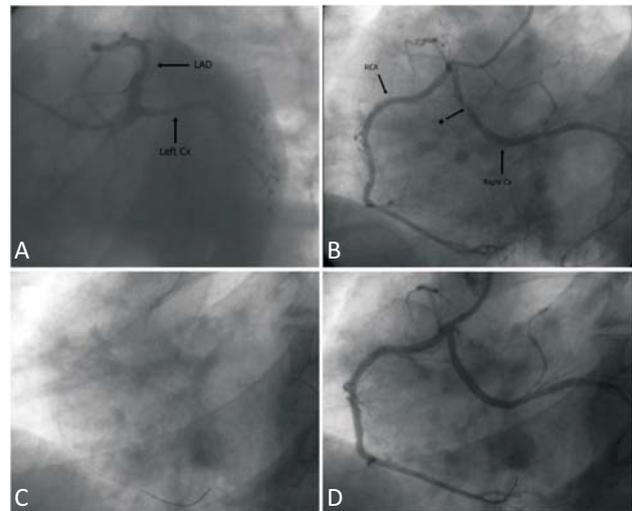
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A 6F Judkins right 4.0 guiding catheter (Launcher, Medtronic, Minneapolis, MN, USA) was used for cannulating the right coronary ostium. First, a 0.014" guide wire (Champion, SP Medical, Karise, Denmark) was inserted into the RCA to provide an improved catheter back-up mechanism. Then, the target lesion was passed using the same kind of second guide wire (Figure 1C). The lesion was successfully treated using a 3.0 × 12 mm bare-metal stent (Integrity, Medtronic, USA) (Figure 1D). Contrast-induced nephropathy was noted two days after the procedure. However, multislice cardiac tomography was deemed inappropriate for this case given the potential associated renal damage that could occur. Thereafter, the patient was discharged five days after the procedure without any complication.

## DISCUSSION

There are only a few cases of twin Cx arteries originating from both the left and right coronary system that have been reported in the literature.<sup>3-8</sup> Cicek et al. reported significant stenoses at both of the twin Cx arteries which led to heart failure,<sup>3</sup> and Karabay et al. reported the kind of anomaly associated with acute myocardial infarction.<sup>4</sup> In the research of Attar et al., they documented a case of twin Cx arteries who presented with coronary artery disease and underwent bypass surgery.<sup>5</sup> Additionally, Van der Velden et al. presented a case with coexistence of coronary fistulae and twin Cx arteries.<sup>6</sup> In that case, a significant stenosis on the anomalous right Cx artery was successfully treated with PCI via the transradial approach.

Coronary artery anomalies most frequently originate from and are involved with the Cx coronary artery. Among these anomalies, one common type routinely manifests as separately originating within the left sinus of Valsalva and the other within the right sinus of Valsalva, or arising from a RCA branch.<sup>9</sup> These anomalies are usually considered benign and clinically asymptomatic.<sup>10</sup> However, some studies have shown anomalous Cx originating from the right sinus of Valsalva was associated with a higher risk of atherosclerosis.<sup>11,12</sup> In addition, myocardial infarction which was associated with anomalous Cx originating from the right sinus of Valsalva and retro-aortic course has



**Figure 1.** Coronary angiography shows: (A) LAD and left Cx arteries in left caudal projection. (B) A severe stenosis (denoted by a star) in the proximal part of the right Cx artery in left oblique projection. (C) Double guide wire technique (one in RCA and the other in right Cx artery) in left oblique projection. (D) An angiographically successful result after implantation of a stent in the anomalous circumflex artery in left oblique projection. Cx, circumflex; LAD, left anterior descending artery; RCA, right coronary artery

been reported in patients undergoing mitral valve surgery.<sup>13</sup>

The transradial approach used for coronary angiography and PCI has been the preferred course of treatment in recent years due to its lower vascular complication rate and reduced limitation of patient activity during hemostasis.<sup>14</sup> Successful transradial PCIs on the stenotic lesion of anomalous coronary arteries have been reported in the literature.<sup>9,15</sup> The origin and course anomalies of coronary arteries may cause technical difficulties in the procedures such as the acute angle of the vessel takeoff and the shape of the ostium.<sup>15</sup> In our case, the guide wire in the RCA provided a better seating and back-up, which made the procedure successful.

## CONCLUSIONS

We encountered an interesting and rare case of twin coronary arteries originating from the left and right sinuses of Valsalva in the case report. Thereafter, a successful PCI via the transradial approach was used to treat the diseased anomalous coronary artery.

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