



Research Brief

Percutaneous coronary intervention of anomalous left circumflex coronary artery - A case series

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ABSTRACT

We report a case series of 14 cases (mean age 54.14 ± 14.75 years) of successful percutaneous coronary intervention of anomalous left circumflex artery. While the intermediate-term follow-up (mean 36.0 ± 20.58 months) was uneventful in 12 patients, one died of a non-cardiac cause, while other lost to follow-up.

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Anomalous origin of the left circumflex artery (ALCx) from the right sinus is the commonest congenital coronary anomaly.¹ Percutaneous coronary intervention (PCI) of ALCx is technically challenging because of difficulty in selective cannulation and lack of coaxial engagement.²

We retrospectively reviewed 14 patients (mean age 54.14 ± 14.75 years) of ALCx PCI over the last 7-years. The origin of ALCx was divided into 3 types²: Type I ($n = 6$) is separate ostial origin of right coronary artery (RCA) and ALCx, type II ($n = 5$) is common ostial origin, and type III ($n = 3$) is when ALCx arises from the proximal RCA. A Judkins Right (JR) ($n = 11$) or Amplatz Right-1 (AR-1) ($n = 3$) coronary guide catheters were used during PCI. One patient required a change of guide catheter from JR to AR1, as the earlier one was not able to cannulate the ALCx. Initial wiring of RCA (two-wire strategy; $n = 9$) helped in anchoring and stabilizing the guide catheter in right coronary sinus so that another wire with curved tip could cross the non-cannulated ALCx. It also helped in precise placement of ostial ALCx stent and to bailout from any significant plaque/carina shift to RCA. Two angiographic views - LAO 40° with cranial 20° and caudal 20° could clearly delineate the ostium of both RCA and ALCx for selective wiring of the later one. The target lesion was of type B and type C in 50% cases, each. The site of the lesion was ostial in 3 (Fig. 1A and F), proximal/retro-aortic in 5

(Fig. 1B, G, 1E, 1J), distal LCx in 5 (Fig. 1C and H) and obtuse marginal in 1 patient (Fig. 1D and I). Eight patients underwent PCI via femoral access and 6 via radial access. A total of 16 stents (15- drug-eluting stents, 1-bare metal stent) were deployed with a mean stent diameter of 2.95 ± 0.33 mm and a length of 26.93 ± 7.92 mm. The average fluoroscopy time was 13.05 min. One patient died of non-cardiac cause at 5-year follow-up and another lost to follow-up after 3-months of intervention. The remaining 12 patients were asymptomatic at mean follow-up 36.0 ± 20.58 months.

Out of the 8100 angiograms performed over the last 7-years, 37 (0.45%) patients had ALCx from the right sinus. Of these, 16 patients had normal coronaries, while 21 (56.7%) had significant obstructive coronary artery disease (CAD). Fourteen cases underwent PCI of ALCx, 5 had coronary bypass surgery for three-vessel disease, and 2 cases had PCI of left anterior descending with normal non-obstructive ALCx.

The angiographic prevalence of ALCx is similar to the existing literature.¹ Contrary to some studies,^{2,3} we did not find ALCx predisposition to atherosclerosis. Although JR or AR-1 guide catheters are frequently used, Amplatz Left and Multipurpose catheters have also been used during PCI.² A two-wire strategy is helpful in guide anchoring/stabilization and also prevent ostial RCA injury. Although femoral access ($n = 8$) could provide good support for various catheter exchange across ALCx, double-wire technique⁴ with radial access can be equally effective. The published literature about ALCx PCI is limited to case reports and a few case series of 12 cases by West NE et al² and 11 cases by Morgan et al.⁵ Although PCI of ALCx is challenging, appropriate angiographic

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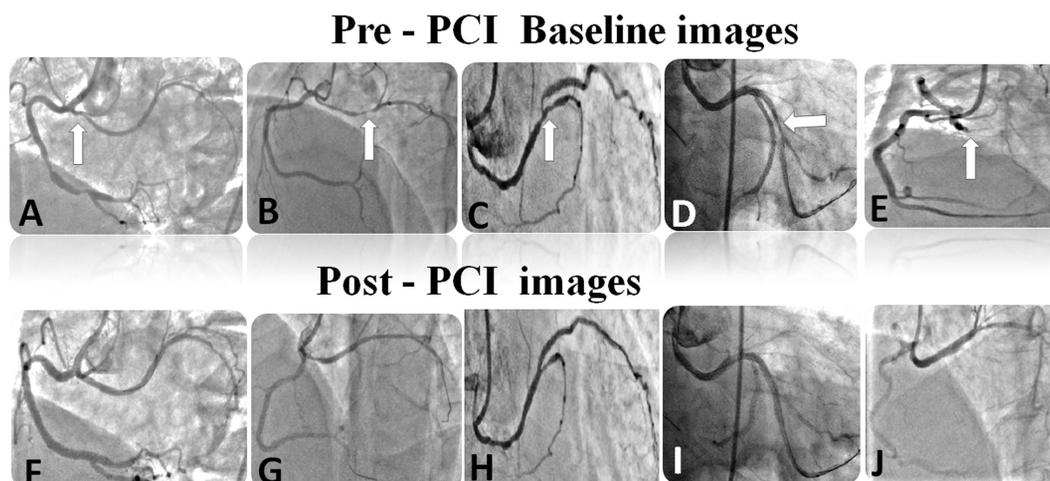


Fig. 1. Coronary angiograms showing baseline (upper row) and post-percutaneous coronary intervention (PCI) images (Lower row) of anomalous left circumflex (ALCx) arising from right coronary sinus. **A and F:** PCI (F) of type III ALCx having an ostial stenotic lesion (A). **B and G:** PCI (G) of type II ALCx having a stenotic lesion at retro-aortic segment (B). **C and H:** PCI (H) of type I ALCx having a stenotic lesion at the distal LCx segment (C). **D and I:** PCI (I) of type I ALCx having a stenotic lesion of obtuse marginal (D). **E and J:** PCI (J) of type II ALCx type having thrombotic occlusion, in a case of single coronary (E). All 3 arteries are arising from the right coronary sinus (E).

views, use of correct hardware, and operator skills could provide a high procedural success rate and favorable clinical outcomes.

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Declaration of Competing Interest

All authors have none to declare.

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