Where is the culprit?

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Right answer: A. Acute occlusion of the anomalous branch of the circumflex coronary artery (CX)

At the first view, no significant abnormality of the left coronary system could be discerned in the left anterior oblique caudal projection (Video 1). However, if carefully examined, it could be noticed in the right anterior oblique caudal projection that there is indeed no visible artery in the left atrioventricular groove and the posterolateral wall (Fig. 3A, Video 2). There could be three possibilities for this occurrence. The first possibility, proximal CX occlusion, is less likely because of the absence of a blunt stump and retrograde filling. The second possibility, a large left ventricular posterolateral branch of the RCA supplying this area, is also not the cause (Fig. 2c, Video 3). A coronary artery arising anomalously should be considered as the third possibility at this stage. Consistent with this, a slight manipulation of the catheter just near the ostium of the RCA revealed the posterolateral branch of the CX arising anomalously, coursing in the right atrioventricular groove, passing the crux, and continuing in the left atrioventricular groove. It was occluded distally (Fig. 3B, Video 4). In brief, while the anterolateral branch of the CX arises from the left main stem, the posterolateral branch of the CX arises anomalously from the right coronary sinus. A drug eluting stent was implanted and normal coronary flow was achieved (Fig. 3C, Fig. 4, Video 5). Meanwhile, it was also recognized that placing the V1 and V2 leads in the second rather than in the fourth intercostal space was the simple cause of poor R-wave progression with minimal ST-segment elevation in leads V1 to V3 that could be misinterpreted as an anteroseptal myocardial infarction.

Choice B. The phenomenon of coronary slow flow in the RCA would not be a likely cause because the dominant RCA supplies the inferior and inferoseptal walls and not the inferolateral wall in this patient (Fig. 2c, Video 3).

Choice C. Although isolated acute right ventricular myocardial infarction may present as ST elevation in leads V1-V3, coronary angiography did not demonstrate an occluded right ventricular branch of the RCA.

Choice D. If a transient thrombus formation in the LAD had been occurred, it would not have resulted in inferolateral wall motion abnormality.

Choice E. The diagnosis of Takotsubo cardiomyopathy requires wall motion abnormalities extending beyond a single epicardial vascular distribution.

Home messages

Clinical, laboratory, and imaging data must always be compatible with each other. The absence of a visible artery in a territory should alert the interventional cardiologist that either the artery is occluded, is congenitally rudimentary, or is arising anomalously.

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Video 4. Coronary angiogram of the anomalous posterolateral branch of the circumflex coronary artery in the left anterior oblique projection before stenting.

Video 5. Coronary angiogram of the anomalous posterolateral branch of the circumflex coronary artery in the left anterior oblique projection after stenting.

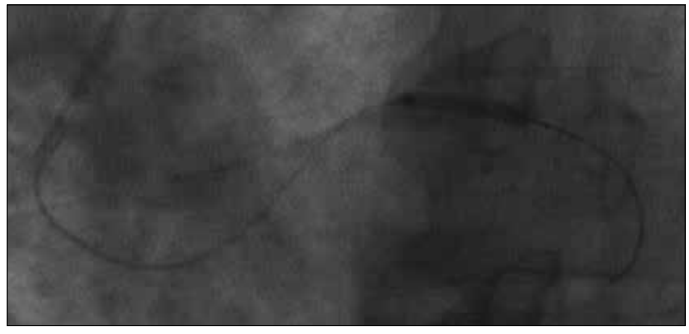

Figure 4. A 2.5×16 mm drug-eluting stent (PROMUS Element™ Plus, Boston Scientific) was successfully implanted at 12 atm

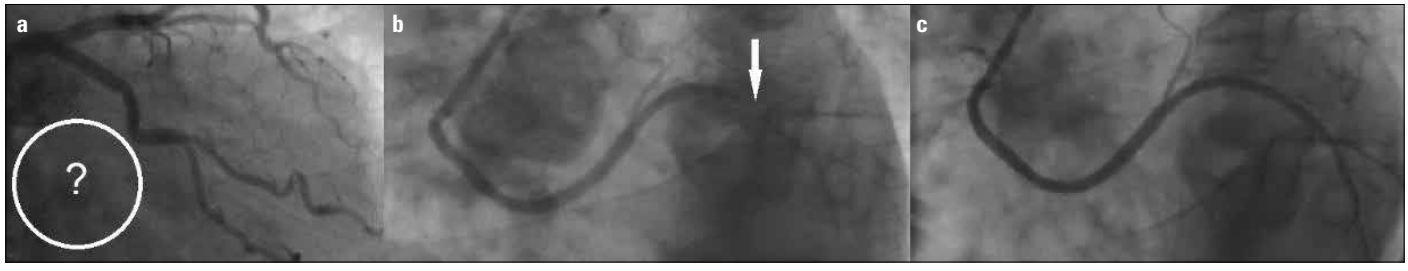

Figure 3. a-c. Circle with a question mark indicates the absence of a visible artery in the posterolateral wall (a). Coronary angiogram of the occluded (arrow) anomalous posterolateral branch of the CX in the left anterior oblique projection before (b) and after stenting (c).