Posterolateral STEMI in patient with coronary artery anomaly

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Background

- •Anomalous origin of the left coronary artery from the right sinus of Valsalva (left-ACAOS) is one of the rarest coronary artery anomalies (CAA) with a reported prevalence of 0,02 0,05 %.
- •Based on the anatomical relationship of the anomalous artery to the aorta and pulmonary artery, the traditional classification differentiates between a malignant variant with an inter-arterial course, and low-risk courses such as retro-aortic, pre-pulmonal or transseptal.



Figure 1 : ECG at admission The findings are indicative for inferior wall ST-elevation myocardial infarction. **Case Report.** An 80-year-old male patient with no history of coronary artery disease (CAD) presented with persistent chest pain. The initial electrocardiogram showed ST-segment elevation in leads II, III, aVF and V5-V6 and concomitant ST-segment depression in leads V1 – V3 (*Figure 1*). Cardiac troponin was above 125.000 ng/L at admission.

Acute coronary angiography (CAG) revealed unexpectedly an anatomic anomaly of the coronary artery system (*Figure 2*):

- A single coronary artery originated from one main stem ostium that arose from the right coronary sinus.
- A large-sized right coronary artery (RCA) coursed regularly, but also supplied the inferior parts of the left ventricle).
- The left coronary artery (LCA) arose from the proximal RCA and gave rise to a hypoplastic left anterior descending artery (LAD) and a small circumflex artery (CX).
- In the periphery of the RCA, we found an occlusion of the posterolateral artery (PLA) as well as a high-grade posterior descending artery (PDA) stenosis. Both lesions were successfully treated by angioplasty with stent implantation (Synergy 2,5x16mm and Supraflex 2,25x20mm).

For further clarification of the coronary anatomy, we performed a coronary CT which confirmed the complex CAA with an **inter-arterial course** of the singular coronary artery without involvement of the aortic root.



Figure 2: Coronary angiography The angiogram revealed a CAA with a single coronary artery originating from the right coronary sinus (left-ACAOS).

Discussion. While left-ACAOS with an inter-arterial course is associated with myocardial infarction in young athletes, in older patients it is often found by coincidence on CAG performed to investigate CAD as observed in this case. The cause of the detected peripheral lesions is unlikely due to the described CAA, although there exists in principle the possibility that the change of hemodynamics in anomalous coronary arteries might affect the development of CAD or myocardial infarction.

Conclusion. This case underlines the importance of coronary CT as an imaging tool for the detection of rare coronary anomalies which can help to define the type of left-ACAOS.