

## C A S E R E P O R T

## Everything in the “right” place: multifocal transient ST segment elevation in patient with single coronary artery arising from the right Valsalva sinus

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**Summary.** Single coronary artery (SCA) is a rare coronary anomaly that occurs with an incidence of 0.024%. We report the case of an 83-year-old woman with a Lipton's type 3 SCA, which is the rarest anomaly within this group, occurring only in the 0.004% of general population. The clinical presentation of this patient was chest pain at rest with multifocal transient ST segment elevation as a marker of multifocal ischemia secondary to severe three vessels coronary artery disease (CAD). This patient was proposed for coronary artery bypass grafting (CABG) with an excellent mid-term outcome. ([www.actabiomedica.it](http://www.actabiomedica.it))

**Key words:** coronary anomaly, coronary artery disease, congenital heart disease, ischemic heart disease, cardiac surgery, chest pain

### Case presentation

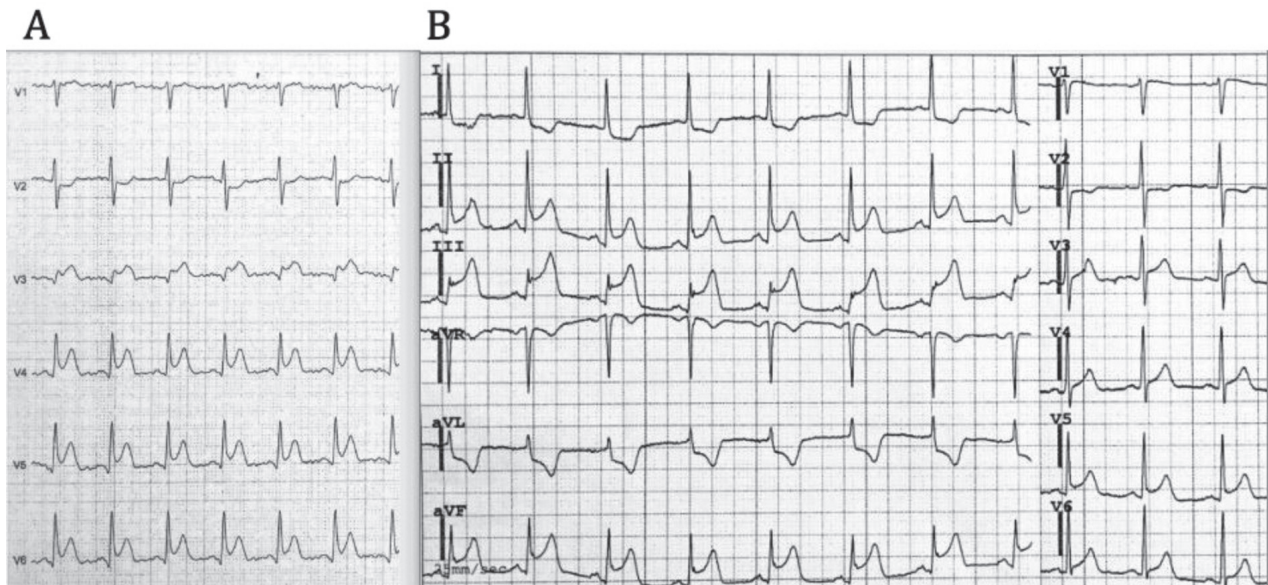
We report the case of an 83 years old woman with hypertension, dyslipidemia and diabetes that had complained chest pain at rest for several months. Her physical examination, electrocardiogram (ECG) and transthoracic echocardiography (TTE) at rest were unremarkable. Stress-echocardiography was scheduled to assess for inducible ischaemia.

On the day of stress echocardiography, a few days after suspension of beta blocker, the patient was symptomatic for typical angina at rest. During chest pain ECG showed ST segment elevation in the anterior leads (figure 1a) with TTE evidence of apical and anterior hypokinesia. Complete regression of symptoms, ECG ST-elevation and segmental kinetic abnormalities were observed with sublingual nitrate and intravenous beta-blocker administration. Troponin dosage was within the limits. Dual antiplatelet therapy was

started in addition to Fondaparinux, statin and intravenous beta blocker that was subsequently switched to oral administration and adequately titrated.

The patient underwent coronary angiography (figure 2), that demonstrated a SCA arising from a single ostium in the right coronary sinus, branching into left anterior descending artery (LAD), left circumflex artery (LCX) and right coronary artery (RCA). The SCA presented significant ostial stenosis (80%) with evidence of some thrombus inside (Ellis type B2); significant stenosis were also present in the proximal segments of LAD, LCX and RCA.

Due to the severity and multifocality of the atherosclerotic lesions of the patient's SCA, involving ostium and proximal segments of the three coronary arteries, CABG was scheduled, suspending Ticagrelor and starting continuous infusion of Tirofiban. During the following days of hospitalisation the patient remained asymptomatic for angina and breathlessness. On the day

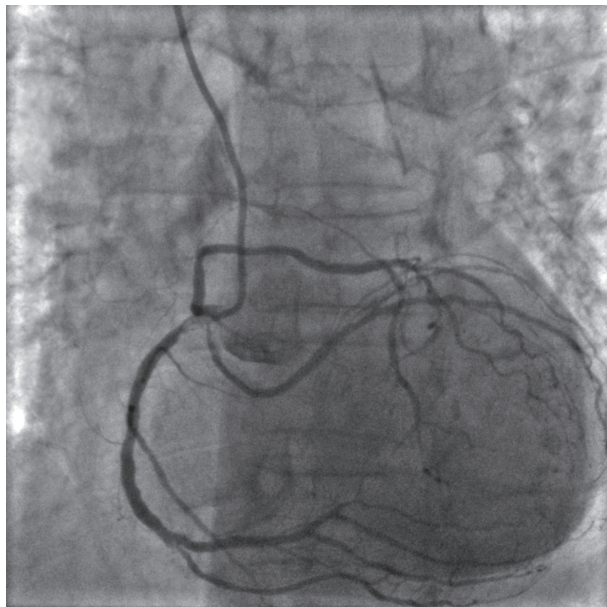


**Figure 1.** Electrocardiogram of the patient at rest on the first day of clinical observation demonstrating a transient ST segment elevation in the anterior leads (1a) and on the day of surgical intervention with a transient ST segment elevation in the inferior leads (1b)

of the intervention, Tirofiban infusion had been suspended six hours before. Subsequently, she complained the onset of nausea and chest pain with ECG evidence

of ST segment elevation in inferior leads (Figure 1b). Therefore, timing of the intervention was speeded up and the patient underwent emergent CABG.

Triple venous coronary artery bypass graft was carried out in absence of peri-procedural complications and with an excellent short-term in-hospital outcome. At 6 months follow-up the patient is fine, without symptoms and in hemodynamic stability.



**Figure 2.** Coronary arteries angiography demonstrating a SCA arising from the right coronary sinus branching into LAD, LCX and RCA with a severe three vessels disease with a prevalent proximal atherosclerosis

## Discussion

In 1979 Lipton et al. sub-grouped SCA into three categories (1). Type 1: a single vessel that follows the course of a normal left coronary artery (LCA) or RCA; type 2: LCA arises from the proximal portion of RCA or vice-versa; type 3: one single trunk originating from the right sinus of Valsalva from which LAD, LCX and RCA arise separately.

Our patient had a type 3 SCA which is the rarest anomaly in this group occurring only in the 0.004% of the general population and the clinical presentation was very unusual.

Indeed clinical presentation of coronary arteries anomalies is usually quite different and a wide spec-

trum of severity can be covered: it is often a casual finding in totally asymptomatic patients, or it can show up with stable angina, chest pain at rest (2), with syncope or sudden cardiac death (SCD); the latter is the most feared clinical expression of SCA and it is usually associated with the anomalous origin of the coronary artery from the opposite side of the aorta (ACAOS), involving left anomalous coronary artery arising from the opposite sinus (L-ACAOS) in 57% of cases and right anomalous coronary artery ACAOS (R-ACAOS) in 25% of cases (3-5).

This types of anomaly have been evaluated with IVUS imaging, demonstrating an intramural proximal intussusception of the ectopic artery at the aortic-root wall (3).

Clinical management of SCA is not well established but much depends on the clinical presentation of the patient. There is no standard treatment for isolated SCA without atherosclerotic coronary artery disease, even if much attention must be given to young athletes with this anomaly above all in ACAOS cases that are more often related to SCD. In stable conditions screening tests should be performed in the suspicion of a coronary artery anomaly, in particular in young people; several imaging techniques could be used, above all cardiac magnetic resonance (CMR); in comparison transesophageal echocardiography (TOE) is more invasive and less accurate, whereas cardiac tomography (CT) results in more precise imaging but the need of ionizing radiation is unacceptable in children and young people.

In our patient SCA was associated with severe coronary atherosclerosis of the ostium and proximal segments with simultaneous multifocal plaque destabilisation, thus leading to significant ischemic symptoms with evidence of multi-leads transient ST segment elevation.

Due to the complexity and severity of the pathology and the multifocal atherosclerotic lesions of the patient's SCA, surgical treatment was chosen with a very good outcome for the patient.

**Conflict of interest:** Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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