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CASE REPORT

RARE CO-EXISTENCE OF CORONARY ANOMALIES: ANOMALY OF ORIGIN AND DISTRIBUTION WITH INTRINSIC CORONARY ARTERY ANOMALY

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ABSTRACT

We describe a 63 year old Romanian female patient admitted to our institution with complaints of typical angina and a diagnosis of non ST-elevation myocardial infarction. Coronary arteriography unveiled anomalous origin of a left circumflex coronary artery from the right coronary sinus of Valsalva near the right coronary ostium and a hyperdominant left anterior descending coronary artery giving off a posterior descending coronary artery with small distal-posterolateral left ventricular branch. The co-existence of a left circumflex coronary artery originating ectopically from the right sinus of Valsalva together with a posterior descending coronary artery originating from the distal end of the anterior descending artery is important to keep in mind especially by those doing coronary angiography in the cardiac catheterization laboratory.

Key words: *Coronary anomaly, coronary angiography, myocardial infarction, percutaneous coronary intervention*

INTRODUCTION

Coronary artery anomalies occur in 0.2 to 1.5% of coronary angiograms(1,2). The aberrant origin of left circumflex (LCx) coronary artery from the right sinus of Valsalva is a relatively common and well known anatomical variation while the occurrence of hyper dominant left anterior descending artery (LAD) giving the posterior descending artery (PDA) as its terminal branch is a rare coronary anomaly.

The co-existence of the LCx coronary artery originating from the right sinus of Valsalva together with a posterior descending coronary artery originating from the distal end of the Anterior descending artery (ie a hyper dominant LAD) is, to our best knowledge, unreported previously. The recognition of this particular anomaly is clinically important especially in patients presenting with both anterior wall and inferior wall myocardial ischemia signs on non-invasive evaluation and subsequent anticipation of this rare possibility when doing invasive procedures. For a proper patient management, anatomical knowledge is also important for some surgical procedures too as described in earlier works (3,5). We describe here the clinical presentation and angiographic findings of a patient with dual coronary congenital anomalies and had undergone DDD Pace Maker implantation for symptomatic sinus bradycardia.

CASE PRESENTATION

We present a case of a 63 year-old Romanian female patient known to have hypertension, peripheral arterial disease, ischemic stroke as well as chronic autoimmune thyroiditis on treatment with Nebivolol, thyroxine, clopidogrel and nitroglycerin for the past two years and a recent pacemaker implantation for symptomatic sinus bradycardia. She was admitted to our institution with typical angina of more than an hour. She had a blood pressure of 145/85mmHg, normal heart sounds a systolic murmur of grade II/VI and normal peripheral arterial pulse. Electrocardiography showed normal sinus rhythm with symmetric T-wave inversions in leads I, AVL, V2-V6, and cardiac enzymes were elevated. Doppler Echocardiography showed left ventricular hypertrophy with hypokinesia in the inferoseptal and apical left ventricle. Serum creatinine and blood urea nitrogen were normal, hemoglobin was 9.8gm/dl, and MCV was 78fL. Lipid profile showed normal results and thyroid stimulating hormone (TSH) was slightly lower while free T4 was slightly elevated.

Coronary angiography with contrast injection in to the right coronary sinus of Valsalva revealed non dominant right coronary with a left circumflex coronary artery originating from the right sinus of Valsalva in proximity with the right coronary artery ostium. The right coronary artery was stenosed by

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30% at its proximal segment (Fig. 1A) while there was no significant stenosis of the anomalous left circumflex coronary artery (Fig. 1B). Cannulation of the left coronary sinus revealed a long left main and then left anterior descending coronary artery continuing to the posterior interventricular septum giving a posterior descending artery and a smaller posterolateral left ventricular branch (Fig. 2A). the proximal LAD was stenosed by 20% (Fig 2B) and the PDA had a 70% distal stenosis (Fig 2C).

A diagnosis of non-ST elevation myocardial infarction (NSTEMI); was made and the patient hospitalized for five days and discharged improved on pantoprazole 20mg/day, thyroxine 75 microgram/day, Ramipril 2.5 mg/day, ASA 81mg/day, Plavix 75mg/day, atorvastatin 20mg/day, and transdermal nitroglycerin patch.

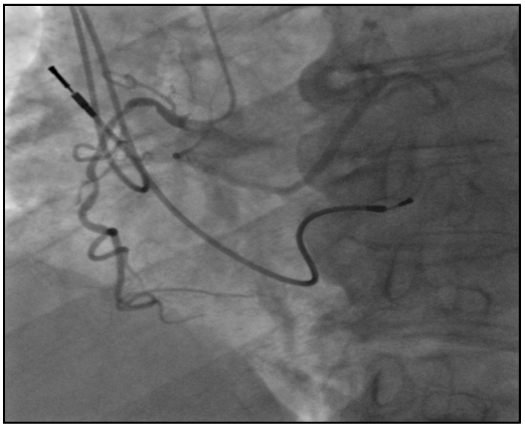

Fig. 1A: Right coronary artery showing 30% stenosis at its proximal segment

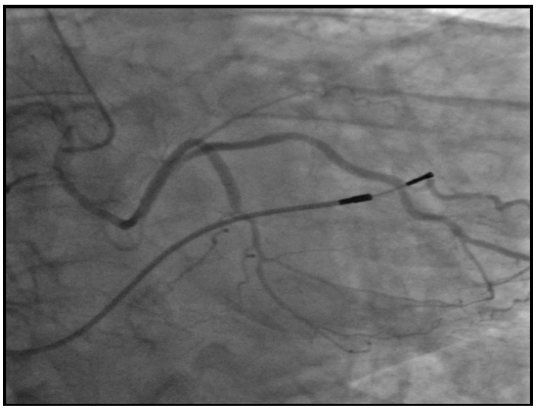

Fig. 1B: Cannulation of the left circumflex artery (LCx) arising from the right coronary sinus of Valsalva. It was with repeated attempts that isolated cannulation of the LCx was made.

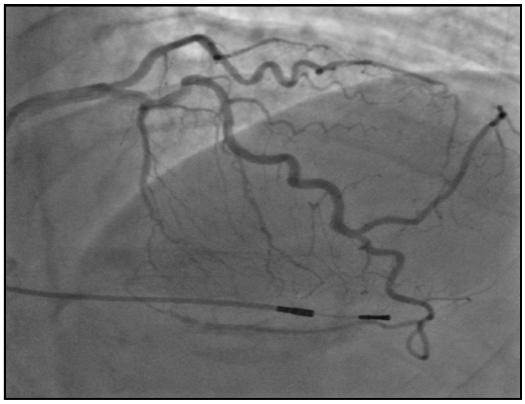

Fig. 2A

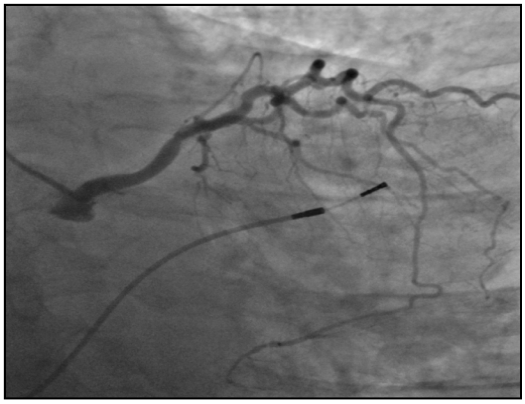

Fig. 2B

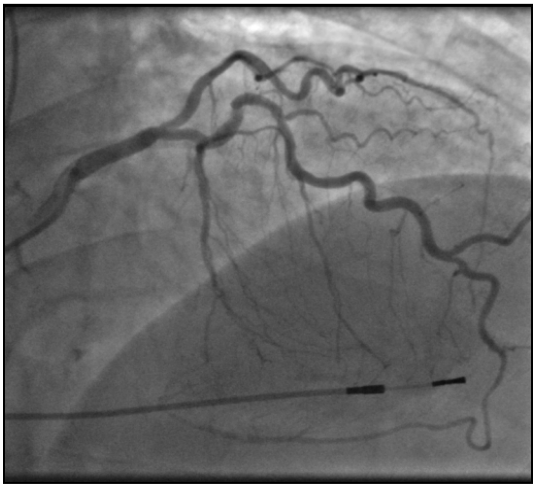

Fig. 2C

DISCUSSION

Previous work has described that in order to ensure appropriate management of patients; coronary artery anomalies require accurate recognition (1,2). Paolo Angelini et al. have described the various coronary artery anomalies and anatomically, they classified coronary artery anomalies into four major groups as:

1) Anomalies of origination and course,
2) Anomalies of intrinsic coronary artery anatomy,
3). Anomalies of coronary termination, and
4) Anomalies of collateral vessels (4).

Clinically, the anomalies may be classified as benign or malignant based on their potential to cause myocardial ischemia. In our case, we identified the coexistence of two distinct anomalies: anomaly of origin and distribution with an anomaly of intrinsic coronary artery. In our patient, both congenital anomalies were concomitantly present, a previously unreported association or coexistence.

An ectopic origin of the left circumflex coronary artery is a well-recognized variant, which is considered the most common coronary anomaly and can be found in approximately 0.4% - 0.7% of patients. The anomalous LCx most commonly arises from a separate ostium with in the right sinus, as is the case with our patient or as a proximal branch of the Right Coronary Artery. There are few case reports on anomalous left circumflex leading to sudden death, myocardial infarction and angina pectoris in the absence of atherosclerotic lesions described more than 20 years ago (8) and, more recently, there has been reports that the ectopic LCx being the culprit atherosclerotic lesion in acute coronary syndromes (5,7).

The PDA which normally arises from the right coronary artery could rarely arise from the LAD, and vice versa on rare occasions as reported by Cingoz F, et al. (12). Javangula K, et al. described the first patient in world literature with LAD continuing as PDA across the left ventricular apex in the presence of a normally situated right coronary ostium with an atretic small right coronary artery and coexistent aortic stenosis (13).

To our best knowledge, there is no case report in the English and Italian literature on patients with co-existence of coronary anomalies described in this case report. The importance of having a high clinical suspicion of the co-existence of this type of rare coronary anomaly cannot be overemphasized.

Informed Consent of a patient: Written informed consent was obtained from the patient to publish this case report.

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