

AN ANOMALOUS LEFT ANTERIOR DESCENDING ARTERY

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Abstract

Coronary artery fistulas can go undetected as they tend to remain clinically silent. Larger fistulas can end up with sudden death, ischemia, endocarditis or CCF. However, these are detected incidentally during non-invasive or invasive diagnostic testing for unrelated symptoms. This report describes such a case in a 56 year old male while undergoing a coronary angiogram following an anteroseptal infarction three weeks prior to the procedure. The fistula arose from the proximal left LAD and was seen in all views. It is important for cardiologists to remember about the possibility of such uncommon possibilities.

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Introduction

A 56 years old male patient underwent elective coronary arteriography at Ibrahim Cardiac Hospital & Research Institute, Dhaka. He had the history of anteroseptal infarction 3 weeks prior to the procedure. He was a smoker, diabetic for 8 years (treated with insulin) and hypertensive for 20 years. He did not have any dyslipidaemia or any family history of premature coronary artery disease. On examination, his pulse rate was 74 / min, normal in volume and regular in character. His systolic / diastolic blood pressures were recorded at 120 / 80 mm of Hg, respectively. Heart sounds were normal with no added sound. On auscultation, both lungs were clear. All routine pre-cath investigations were within normal limits. Resting ECG showed sinus rhythm with Q in V1 to V4 and T-wave inversion in I, avL, V5 and in V6. Echocardiography showed moderately hypokinetic anteroseptal wall with left ventricular ejection fraction (LVEF) of 45%.

Coronary Angiogram Report: His coronary angiography revealed normal left main stem (LMS). The first and second diagonal had mild disease, otherwise there was no critical lesion. The unusual findings in this case was a fistula arising from proximal left anterior descending artery (LAD) prior to the lesion

that communicated with the left atrium. This fistula was seen in all views.

Discussion

This case was diagnosed as a case of single vessel disease (SVD). He had the fistula repaired by ligation along with a percutaneous transluminal angioplasty (PTA) to left circumflex artery (LCx). Antibiotic prophylaxis for endocarditis is recommended for coronary artery fistula. Coronary artery fistulas may also be treated with percutaneous transcatheter occlusion using a detachable balloon, detachable coils, double umbrella devices and microparticles of polyvinyl alcohol foam or they can be treated surgically with a simple ligation. Ligation is performed preferably at the point of entry of the coronary artery to the cardiac chambers. When this is not possible ligation is performed internally.

Coronary artery anomalies may involve abnormalities of origin and or course as structure of the epicardial coronary arteries. Anomalous origin include the origin of left main, left anterior descending, left circumflex or right coronary arteries from the pulmonary trunk. Anomalous origin and course are also of many types.

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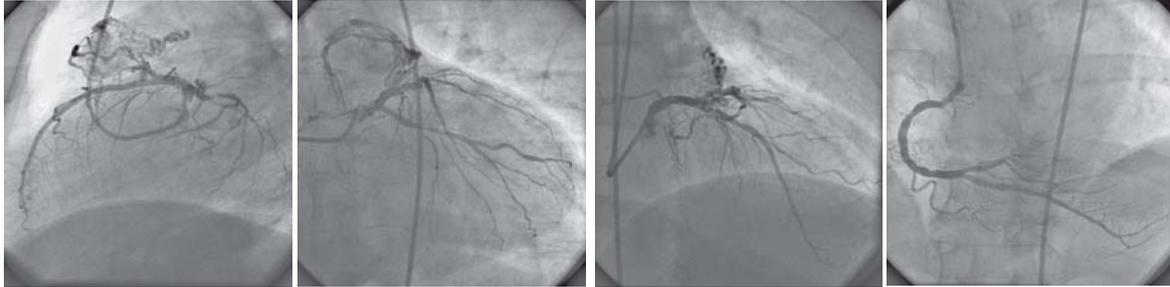


Fig-1. *Fistula arising from proximal left anterior descending artery (LAD) prior to the lesion that communicated with the left atrium*

Fig-2. *Fistula seen in Postero-Anterior caudal view.*

Fig-3. *Left circumflex artery was non-dominant and represent by the principal OM, that has a 80% discrete concentric lesion in the proximal part.*

Fig-4. *The right coronary artery (RCA) was dominant free of any significant disease.*

One common type in left main coronary artery originating from the proximal right coronary artery or vice versa, the anomalous artery may take 1 of the 4 aberrant pathways to reach its proper vascular territory. Anomalous course and termination include myocardial bridges and fistulas. Fistulas develop when one of the major epicardial coronary arteries terminate abnormally into one of the cardiac chambers. These fistulas can originate from the left, right or both coronary artery systems. Most fistulas drain into the right heart. The coronary pulmonary AV fistulas are very rare and incidence of bilateral coronary pulmonary AV fistula from same coronary artery are extremely rare. Abnormal coronary structure includes congenital coronary stenosis, congenital coronary atresia and hypoplastic coronary arteries.

Most coronary artery anomalies are clinically silent and do not affect the quality of life or life span of the affected individuals. These are usually discovered incidentally during non invasive or invasive diagnostic testing for unrelated symptoms. Large coronary artery fistulas may be associated with sudden death, myocardial ischemia, bacterial endocarditis or congestive heart failure. The exact incidence of these clinical events is not known. In large fistulas, sudden death has been attributed due to impairment of diastolic coronary artery flow. Large fistulas may reduce myocardial perfusion and thus cause ischemia. Large coronary artery fistulas may result in right or left sided cardiac volume overload with or without symptoms of congestive heart failure. The haemodynamic effects of coronary artery fistulas depend on their site of drainage, diameter and length.

Drainage into the right heart produces right to left shunt with dilation of the right heart chambers and increase in pulmonary resistance. Drainage into the left heart produces left ventricular volume overload that may clinically mimic insufficiency. Coronary artery fistulas may result in an increased risk of infective endocarditis or endarteritis depending on the location of the fistula.

Physical findings are generally absent in most congenital coronary artery anomalies. Signs that may be present in a large coronary artery fistula are tachypnoea and respiratory distress, continuous precordial murmur, systolic murmurs of mitral regurgitation, S3 or S4 gallop rhythms, cardiomegaly, hepatomegaly, edema, peripheral failure to thrive in infants etc.

The exact pathogenic mechanisms for development of coronary fistulas are not well understood. According to extensive embryologic studies, formation of a normal coronary arterial system depends on multiple morphologic features, including formation of cardiac sinusoids, development of coronary buds on embryologic aorto-pulmonary trunk, and selective connection between the two systems. Any malformation within these systems may lead to development of coronary artery anomalies i.e. coronary fistulas. Some congenital heart diseases are found in association with coronary artery fistulas. Pulmonary valve atresia with intact ventricular septum may be associated with solitary coronary artery or coronary artery fistula draining into the right ventricle. Tetralogy of Fallot (TOF) may be associated with ectopic coronary artery origin or coronary artery fistula draining into the pulmonary trunk.

Coronary artery fistulas are usually detected as an incidental finding while doing other tests, like coronary angiogram. However, trans-esophageal echocardiogram (TEE), electron beam computed tomography (CT), MRI (Magnetic Resonance Imaging), MRA (Magnetic Resonance Angiogram) can visualize the course of the fistula. Now a days CT coronary angiogram has been proven as a very sensitive modality of detecting the fistulas. Definitive diagnosis requires selective arterial angiography via catheterization.

Coronary artery fistulas can cause sudden cardiac death, myocardial ischemia, congestive heart failure and bacterial endocarditis. Hence it is clinically important to know about this abnormality and cardiologists should remember its possibility however uncommon it might be.

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