

Case report

Primary percutaneous coronary intervention in patient with dual left anterior descending artery

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ABSTRACT

The anatomy of the coronary arteries is well known, but there is a wide variety in their origin and distribution. The dual left anterior descending artery is defined as the presence of two left anterior descending arteries within the anterior interventricular sulcus and is classified into four types. It is a benign anatomical variant that should be recognized, especially before interventional procedures. We report a patient with type I dual left anterior descending artery, with acute anterior wall ST elevation myocardial infarction, referred for primary percutaneous coronary intervention.

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Intervenção coronária percutânea primária em paciente com artéria descendente anterior dupla

RESUMO

A anatomia das artérias coronárias é bem conhecida, mas há grande variedade em sua origem e distribuição. A artéria descendente anterior dupla é definida como a presença de duas artérias descendentes anteriores dentro do sulco interventricular anterior, sendo classificada em quatro tipos. É uma variante anatômica benigna que deve ser reconhecida, especialmente antes de procedimentos intervencionistas. Relatamos o caso de um paciente com artéria descendente anterior dupla tipo I, com apresentação clínica de infarto agudo do miocárdio com supradesnivelamento de segmento ST em parede anterior, encaminhado para a realização de intervenção coronária percutânea primária.

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Introduction

Left anterior descending artery (LAD) is an artery with a more consistent pattern in its course and distribution in coronary circulation and, usually, originates in the left main coronary artery, runs through the anterior interventricular sulcus and issues septal and diagonal branches, which ensure irrigation of anterior, septal and lateral walls of left ventricle.

The anomalies of coronary origin and course are widely described and classified in the literature. However, cases of dual LAD are rarely described, in which a short segment ends at the upper portion of the anterior interventricular sulcus and a long-branch segment reaches the apex.

The correct angiographic recognition of anatomical variations is very important during revascularization procedures, whether by percutaneous or surgical route, especially in cases of primary percutaneous coronary intervention (PCI).

Case report

This is a male patient, aged 71 years, transferred from the Basic Health Unit to cardiologic emergency unit of Santa Casa de Ribeirão Preto, due to chest pain with 8 hours' duration and an electrocardiogram with an extensive anterior ST-segment elevation. At admission, the patient was in Killip I functional class, the blood pressure

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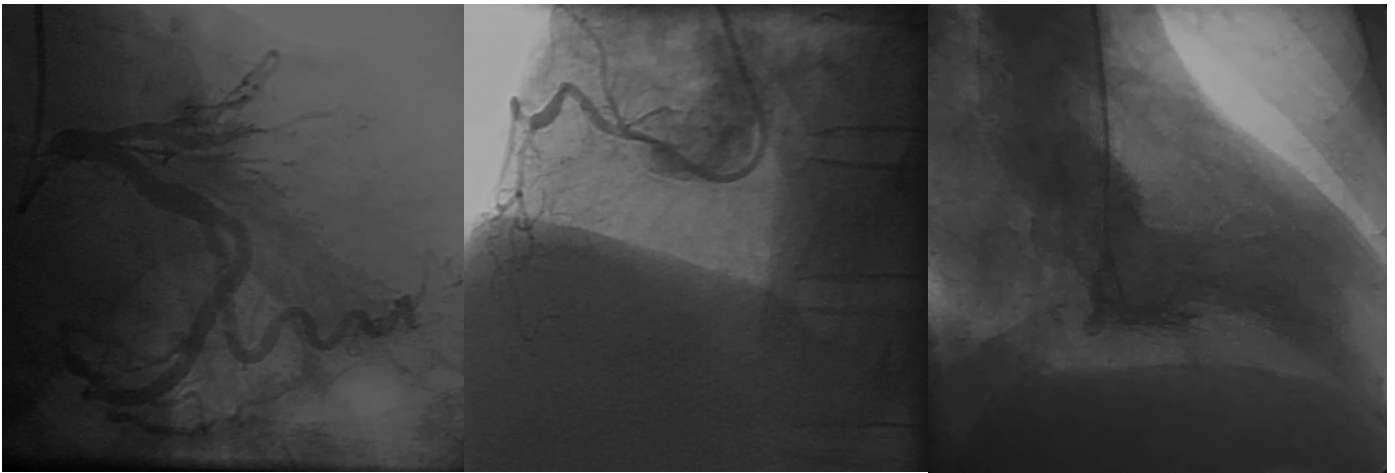


Figure 1. Left coronary angiography and ventriculography. Occlusion of left anterior descending artery. Not dominant right coronary. Left ventricle displays anteroapical akinesis.

was 170 × 90 mmHg, heart rate 94 bpm, peripheral oxygen saturation 96%, and receiving oxygen through a nasal cannula at 2 L/min. The heart and lung auscultations were normal.

With the clinical diagnosis of Killip's class I ST-segment elevation myocardial infarction, pharmacological measures have been implemented (acetylsalicylic acid - ASA 200 mg, clopidogrel 600 mg, and intravenous nitroglycerin), and the patient was referred to primary PCI.

Coronary angiography was performed by brachial artery puncture with a 6 F sheath, due to excessive tortuosity, spasm and no guide wire progression by radial approach. The examination showed proximal occlusion of LAD; absence of obstructive lesions in left circumflex and right coronary arteries; and left ventricular anteroapical akinesis (Fig. 1).

The patient underwent primary PCI, with administration of 100 IU/kg of unfractionated heparin and passage of a 0.014-inch intermediate Choice™ guide wire (Boston Scientific Corporation, Natick, USA). Then, pre-dilation with a 2.5 × 10 mm Pantera Lux™ semi-compliant balloon catheter (Biotronik, Bulach, Switzerland) up to 8 atm was performed, followed by implantation of a 2.75 × 15 mm Multilink™ stent (Abbott Vascular, Santa Clara, USA) up to 14 atm. A control coronary angiography showed dissection of distal border of stent, which was treated with implantation of a new 2.5 × 18 mm Multilink™ stent (up to 12 atm), with good angiographic result and TIMI 3 distal runoff (Fig. 2).

As the patient remained with residual pain and with persistence of ST-segment elevation after leaving the catheterization laboratory, coronary angiography was revised. An anatomical variant was hypothesized, considering that the treated LAD did not reach the apex; thus, the patient was restudied by femoral approach, with imaging findings suggestive of contrast retention at the first diagonal branch.

A new procedure was performed by right femoral route with a 6-F sheath; 100 IU/kg of unfractionated heparin was administered. The previously implanted stents were patent; we opted for the passage of a 0.014-inch Galeo™ guide-wire (Biotronik, Berlin, Germany) at the occlusion point with pre-dilation with a 2.0 × 10 mm Pantera™ semi-compliant balloon catheter (Biotronik, Berlin, Germany) up to 6 atm. On that occasion, a new LAD bed was visualized, with occlusion at the proximal segment. A 2.5 × 38 mm Multilink™ stent was implanted at 12 atm in the middle segment, and a 2.57 × 23 mm Multilink™ stent was implanted at 12 atm in the proximal segment, with overlapping of its borders. The final angiographic result was satisfactory, with a TIMI 3 distal runoff (Fig. 3).

A final control angiogram showed presence of a type I dual LAD (Spindola-Franco), with a short branch that issued septal branches and a long-branch branch that issued diagonal and distal septal branches (Fig. 4).



Figure 2. Primary percutaneous coronary intervention in the left anterior descending artery with implantation of two stents. Note the small artery which issues septal branches, but without reaching the apex.

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