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Clinical Image

Right Coronary Occlusion with Collateral Channel from the Bronchial Artery and its Potential Implications -

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CLINICAL IMAGE

A 73-year-old man was admitted to our hospital complaining of gross hematuria together with blood clot for 5 days. His previous medical history included hypertension, cardio myocardial infarction and subtotal gastrectomy. He described his acute ischemic attack of cardio myocardial infarction 6 years before and then received intravenous thrombolysis using urokinase for two-week duration at his local hospital. Afterwards the patient recovered to normal, and had been oral aspirin 100mg daily. Laboratory investigations including routine blood test, coagulation studies, myocardial enzymes and basic metabolic panels revealed no abnormalities. Electrocardiography revealed old inferior myocardial infarction. Coronary computed tomographic angiography indicated a relatively short coronary total occlusion with a collateral vessel from a high-takeoff thin artery with tortuous course suggestive of bronchial artery (Figure A-C). There was moderate stenosis of the proximal segment of the left anterior descending artery (Figure D). The patient refused further invasive coronary angiography and additional management owing to lacking any impact on his routine life. There was no abnormal findings of urinary system detected on abdominal CT evaluation except for prostatic hypertrophy. After aspirin was discontinued, his hematuria

was totally resolved one week later.

Coronary-to-bronchial anastomosis is a rare condition, which may be present from congenital anomaly or acquired occurrence [1,2]. Coronary angiography and contrast-enhanced multidetectors CT with retrospective electrocardiographic gating may help clinicians detect coronary-to-bronchial anastomosis, which defines the originating artery, arterial course of the communications and other associated results [3]. When coronary-to-bronchial artery anastomosis is found, ischemic conditions in either the lung or the heart are likely. Frequently, this communication may be associated with coronary steal, however, well-developed collateral circulation similar to coronary artery bypass graft is seldomly reported in the setting of coronary artery occlusion.

As known, bronchial arterial hypoxia in chronic pulmonary disease often induces collateral connections from the coronary artery [1]. On the roof of the left atrium lacking pericardial covering, the coronary and bronchial arteries are not separated, leading to coronary-to-bronchial artery communication. Meanwhile, the feeding arteries of the coronary-to-bronchial artery anastomosis are observed exclusively in the sinoatrial nodal artery of the Right Coronary Artery (RCA) or the left atrial artery of the Left Circumflex Artery (LCA) to variable bronchial arteries. Coronary total occlusion of the proximal RCA or LCA may result in collateral circulations from the bronchial artery to prevent myocardium against ischemia-reperfusion injury, which is similar to coronary artery bypass, as described in our patient.

This case helps us a better understanding for the collateral channels of coronary-to-bronchial artery. Firstly, visualization of the distal lumen is essential for treating total occlusion of coronary artery. The distal end may be visualized via bronchial injection when contralateral injection in coronary system is unavailable. Secondly, bronchial artery embolization is a well-known treatment for those patients with massive hemoptysis, but there is a risk of myocardial infarction during this procedure once the presence of undetected coronary-to-bronchial artery anomalous connection [4]. Thirdly, recurrent hemoptysis occurs despite successful embolization of possible systemic arteries, a coronary angiography should be performed, especially in patients with reduced cardiopulmonary reserve and longstanding cardiopulmonary disease [5].

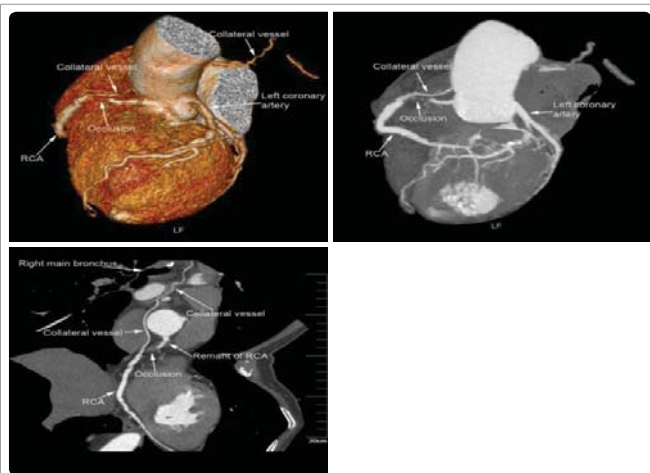


Figure A-C: Coronary CT angiography indicated a relatively short coronary total occlusion with a collateral vessel from a high-takeoff thin artery with tortuous course suggestive of bronchial artery.

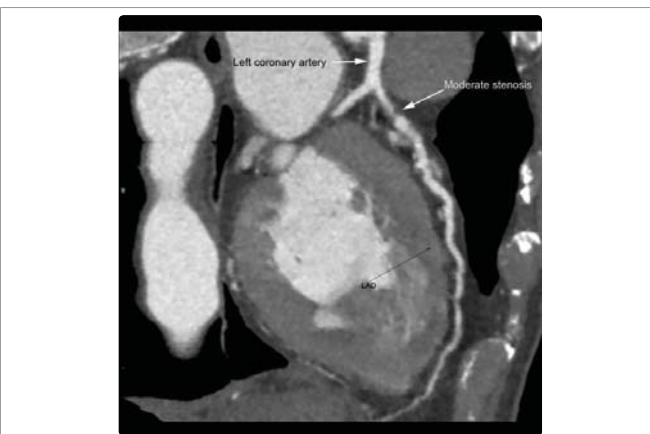


Figure D: Proximal segment of the left anterior descending artery.

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