

Diagnosis of Incidental Coronary-to-Bronchial Artery Fistula with CT Angiography: A Case Report

CT 혈관조영술에서 우연히 발견된 관상동맥기관지 동맥루의 진단: 1예 보고

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We report the case of a 64-year-old man with coronary-to-bronchial artery fistula (CBF) that was detected incidentally; the patient presented with the clinical manifestations of aortic dissection. Coronary CT angiography demonstrated tortuous vessels originating from the left circumflex coronary artery that were in communication with the bronchial arteries. CBF is a rare coronary artery anomaly and CBFs are asymptomatic in most cases. Familiarity with CT findings of CBF may help diagnose the incidental finding of CBF through the use of CT angiography undertaken for a different diagnostic purpose.

Index terms

Coronary-to-Bronchial Artery Fistula
Cardiac
CT Angiography

INTRODUCTION

Coronary-to-bronchial artery fistula (CBF) is a rare anomaly of the coronary artery. Most CBFs are clinically silent and are generally diagnosed incidentally during coronary angiography. In the largest coronary cineangiography series conducted to date by Matsunaga et al. (1), the CBF were observed in 16 of the 2922 consecutive patients who underwent selective coronary cineangiography during a 10 year at one institution. Although cardiac catheterization is considered the best method for identifying these types of vessel communications, the recently development of multi-detector computed tomography (MDCT) systems could be used to detect CBF (2, 3). In this report, we present a case of CBF in a 64-year-old man with clinical manifestation of aortic dissection that was detected by aortic CT angiography and diagnosed by coronary CT angiography.

CASE REPORT

A 64-year-old man presented with acute onset epigastric

pain. On examination, his blood pressure was 180/100 mm Hg with a heart rate of 95 beats/min. Blood test findings, including cardiac enzymes, such as, creatine kinase MB (CK-MB), troponin I, and d-dimer, were all within the normal range. Aortic CT angiography (CTA; 320-row MDCT; Aquilion ONE, Toshiba Medical Systems, Otawara, Japan) was performed to rule out aortic dissection. We injected intravenously 100 mL of nonionic contrast material (Xenetix[®]; iobitridol 350 mgI/mL; Guerbet, Roissy, France) at 4 mL/s into patients and a CT scan was started using automatic bolus triggering in the ascending aorta (the triggering level was 300 HU) in the craniocaudal direction. Aortic CTA revealed a diffusely dilated aorta with intimal dissection from the just distal portion of the left subclavian arterial origin to both common iliac arteries (Fig. 1A). In addition, tortuous vascular structures were identified along the pericardial reflections (transverse sinus, oblique sinus, and atrioventricular groove) and left bronchovascular bundles (Fig. 1B), and seemed to be a continuation of the coronary arteries. Furthermore, in the lung window setting chest CT, cystic bronchiectasis was well demonstrated in the left lower lobe (Fig. 1C).

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Subsequent coronary CT angiography (CCTA) was performed to determine the origins of the anomalous tortuous vessels using the same CT scanner. Nonionic contrast material (70 mL) was injected at 4 mL/sec followed by 30 mL of contrast-saline mixture (2 : 8 diluted), and a CT scan was started using automatic bolus triggering in the ascending aorta at a triggering level of 100 HU with a 5 sec delay. CCTA images were obtained by prospective data acquisition at 70-80% of the R-R interval using the following scan parameters: tube voltage 100 kV, tube current 520 mA, and gantry rotation time 350 msec. CCTA demonstrated that the dilated anomalous vessels originated from the left circumflex coronary artery and coursed along the left side of the left atrium, which communicated with the bronchial circulation (Fig. 1D-G). Since there were no symptoms associated with coronary artery steal phenomenon (i.e. ischemic symptoms, such as chest pain or tightness) and no evidence of hemorrhage, the patient did not undergo conventional coronary angiography for treatment. No clinical events occurred during 3 months of follow-up.

DISCUSSION

The prevalence of coronary artery anomalies has been estimated to be 1.3% in patients that undergo coronary arteriography, and coronary fistulas account for 13% of these anomalies (4). However, CBF is encountered very rarely, and most reports have been of isolated cases (2, 5). In a recent study, the incidence of CBF was estimated to be 0.61% among those undergoing CCTA (5). CBFs are believed to be congenital anastomosis between the coronary arteries and bronchial arteries. Some underlying pulmonary diseases, such as bronchiectasis or chronic pulmonary inflammation can cause anastomoses to dilate (2). It has been suggested that CBFs are present in all patients from birth and normally remain closed, but that a sizable CBF may result from considerable and persistent disturbance of the pressure equilibrium (3, 6). CBFs usually originate from the left circumflex artery via a left atrial branch (in 75% to 81%) (1, 3). In our case, we believe that the CBF was caused by bronchiectasis with parenchymal destruction of the left lung. Although cardiac catheterization

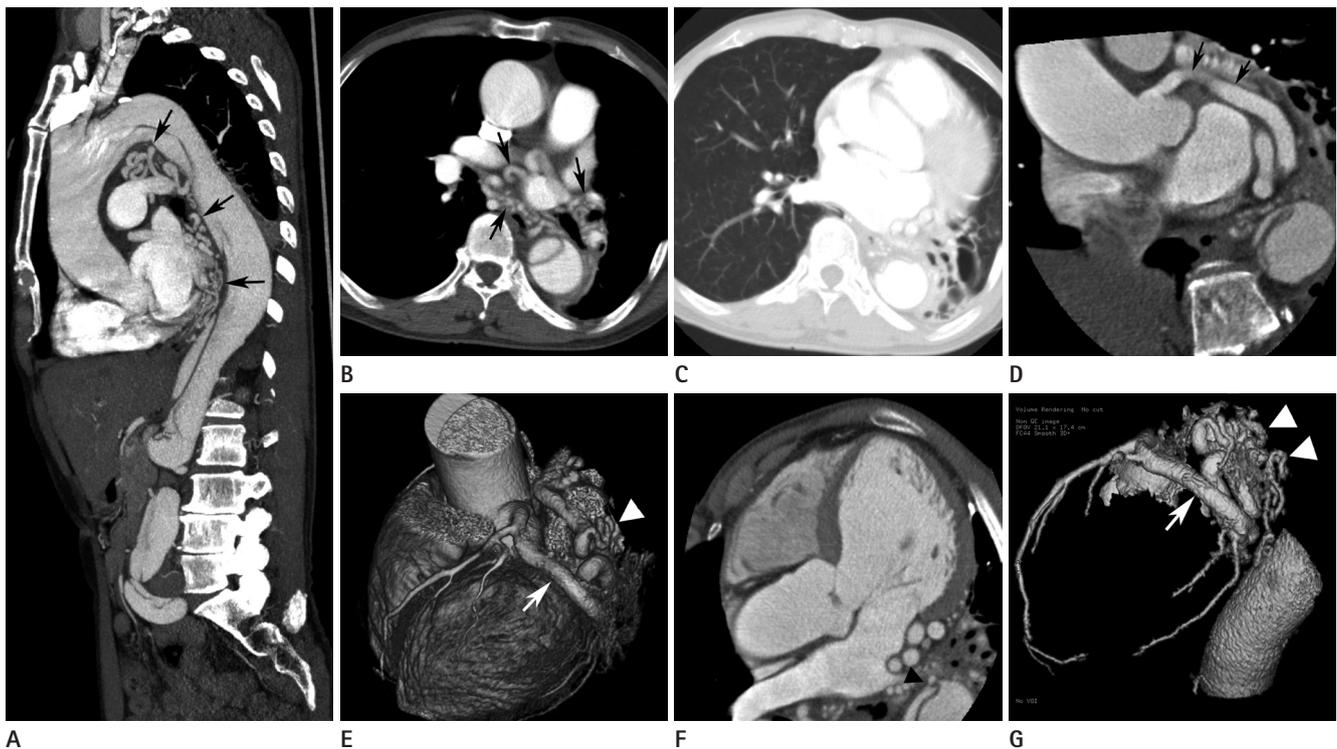


Fig. 1. A 64-year-old man with a coronary-to-bronchial artery fistula and dissecting aortic aneurysm. **A-C.** Aorta CT angiography shows a diffusely dilated aorta with intimal dissection from just the distal portion of left subclavian arterial origin to both common iliac arteries (**A**). Tortuous vascular structures are identified along the pericardial reflections and bronchovascular bundles (arrows in **A, B**). In the lung window setting, cystic bronchiectasis with markedly decreased volume is observed in the left lower lobe (**C**). **D-G.** Coronary CT angiography shows that the tortuously dilated anomalous vessels originate from the left circumflex coronary artery (arrows) and course along the left side of the left atrium to communicate with the bronchial circulation and the thoracic aorta (arrowheads).

is widely regarded to be the best diagnostic method for identifying such communications, it is invasive and has a high degree of risk. On the other hand, CCTA is reliable in identifying and defining anomalous coronary arteries and their courses (2, 3). Furthermore, in our case described, conventional angiography could not have been performed because of extensive aortic dissection. Most patients with CBF are asymptomatic, but cardiovascular symptoms and signs, such as, continuous machinery murmur, angina due to coronary steal phenomenon, congestive heart failure, infective endocarditis, and rupture of an aneurysmal fistula, may develop (3-5). CBFs can also cause hemoptysis (7, 8). Stent grafting and coil embolization are regarded as the best treatment methods for coronary steal phenomenon (5). In cases of severe coronary artery disease, bypass surgery with surgical ligation of the CBF can be an appropriate treatment, and in some cases of recurrent hemoptysis, embolization of the coronary artery may be considered to stop bleeding (7, 8). Our patient did not exhibit any cardiovascular symptoms or hemoptysis and his chief symptoms were associated with aortic dissection. Therefore, our patient did not undergo endovascular treatment.

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강은주 · 이기남 · 김우정 · 이진화 · 오종영

저자들은 대동맥류 박리를 주소로 내원한 64세 남자에서 대동맥 CT상 우연히 발견된 관상동맥기관지 동맥루를 보고하고자 한다. 관상동맥 CT에 좌회전 관상동맥에서 기시하여 기관지 혈관과 연결되는 확장된 혈관들이 확인되었다. 관상동맥기관지 동맥루는 드문 관상동맥 기형이며 대부분 무증상이기 때문에 다른 목적으로 촬영한 CT에서 우연히 발견될 수 있다.

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