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A Case Report of Aberrant Bronchial Artery from Common Carotid Artery: A Potential Hazard in Bronchial Artery Embolization[1]

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Embolization of the bronchial artery is a well-established treatment for patients with hemoptysis. To our knowledge, a case involving an aberrant bronchial artery from the common carotid artery has never been reported. The authors describe a case in which an aberrant bronchial artery from the left common carotid artery was a potential hazard during embolization of the bronchial artery.

Index words : Lung, hemorrhage
Arteries, bronchial
Embolism, therapeutic
Angiography

Embolization of the bronchial artery is a well-established treatment for hemoptysis (1-4). For complete embolization as well as to avoid embolization on a non-target organ, precise knowledge of the anatomy of the bronchial artery is important (5-7).

We describe a case in which an aberrant bronchial artery from left common carotid artery, communicating with the left bronchial artery, found during embolization of the bronchial artery, was a potential hazard during this procedure.

Case Report

A 58-year-old man with a previous history of pulmonary tuberculosis was admitted to the emergency room due to massive hemoptysis of about 300cc, which had occured the same day. Chest PA showed streaky density in both upper lobes, and nodular density in the left upper lobe suggested active tuberculosis (Fig. 1). The patient was referred to our department for bronchial embolization. A bronchial angiogram using a Gifu 6.5-Fr right bronchial catheter (GRB; Clinical Supply, Gifu, Japan) showed a hypertrophied left bronchial artery originating from the common trunk with the right bronchial artery (Fig. 2). We decided to perform embolization of the left bronchial artery using a 150-250 μm Contour particleTM, ((PolyVinyl Alcohol (PVA), Interventional Therapeutics Corporation, South San Francisco, CA). After placing the 6.5-Fr right bronchial-type catheter in the left bronchial artery, coaxial catheterization of this artery was achieved by means of a 3-Fr Microferret infusion catheter (Cook, Blooming-ton, Ind., U.S.A.), and the artery was embolized (Fig. 2).

When blood flow had become sluggish after emboization with half a vial of Contour particles (1.0 cc dry volume/vial), the patient started to complain of sudden pain on the left side of the face and in the left ocular region. Simultaneously, we observed embolic particles passing upward to the neck vessels, and so stopped embolization. Subsequent angiography of the left bronchial artery revealed an aberrant artery arising from the left carotid artery and communicating with the proximal portion of the left bronchial artery. Through that artery,

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contrast media moved upward to a tubular structure consistent with the left common carotid artery (Fig. 3).

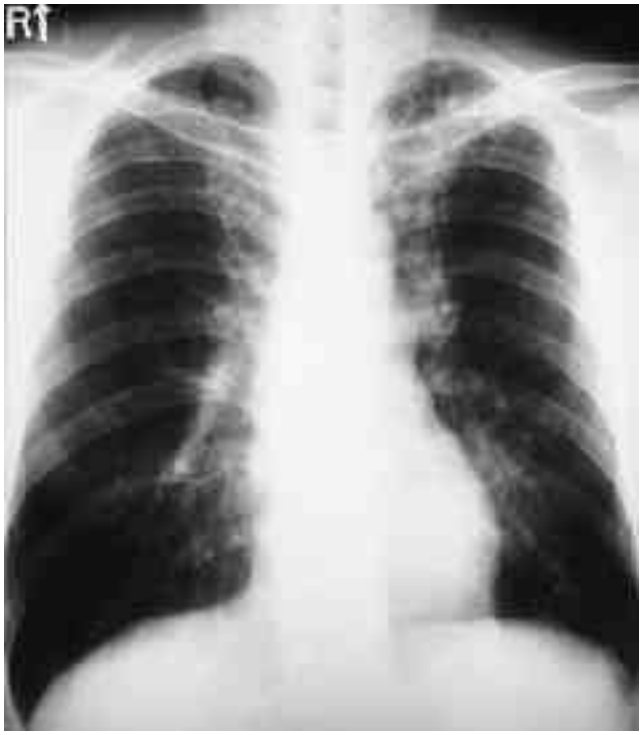
In order to identify the aberrant bronchial artery, arch aortography was performed, but it was difficult to identify the aberrant artery arising from the left common carotid artery and seen during bronchial artery embolization; we believe this was due to flow reversible in this aberrant artery, caused by the embolization procedure. About twenty minutes later, the patient's symptoms disappeared spontaneously.

Discussion

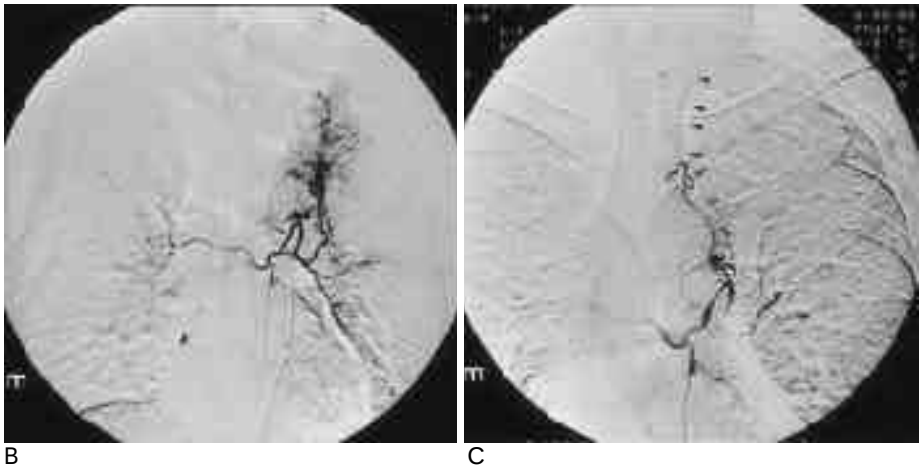
Bronchial artery embolization has become an established technique in the management of massive or recurrent hemoptysis. It has been shown that safe and rapid control of hemoptysis can usually be achieved by therapeutic embolization of the bronchial arteries when the source is systemic blood supply to the lungs (2, 8, 9).

The origin of the bronchial artery is quite variable. Approximately 70 % arise from the descending thoracic aorta at the level of T5-T6; they occasionally arise from the aortic arch and rarely from branches of the subclavian artery. Anatomic channels between bronchial and other mediastinal arteries are normally present, and in pathologic conditions, they can become enlarged. These nonbronchial collateral arteries can cause hemoptysis, and when injection of the bronchial artery fails to demonstrate a likely source of hemorrhage, this possibility must be addressed. The intercostal, inferior phrenic, internal mammary, and thyrocervical arteries, as well as other subclavian branches, are commonly involved.

During embolization of the bronchial artery, the retrograde flow of embolic materials in the aorta may lead to complications. In additions, the passage of embolic agents through aberrant branches such as the radiculospinal arteries or collaterals communicating with adjacent arteries (e.g. the coronary arterial system or large arteriovenous fistulae) may cause non-target organ embolization (10-14). Infarction of the spinal cord is the most serous reported complication in selective bronchial arterial embolization, and occurs because radiculospinal arteries may arise from bronchial arteries (15). Collateral



A



B C

Fig. 1. A 58-year-old man with massive hemoptysis.
A. Chest radiograph shows nodular and patchy increased opacities in left upper lung zone and streaky densities in right upper lung zone suggesting pulmonary tuberculosis.
B. Bronchial artery angiogram demonstrates the hypertrophic left bronchial artery originating at T5-6 level (arrows) which shows common trunk with right bronchial artery.
C. On left bronchial arteriogram performed during bronchial artery embolization, aberrant bronchial artery (arrows) communicating proximal portion of left bronchial artery is seen. Tubular faint contrast filling (arrowheads) is seen through this artery due to opacification of left common carotid artery.

circulation from the coronary to the bronchial arterial system is well known. Tiny anastomoses with little or no hemodynamic significance, presumably congenital in origin, have been shown in normal subjects. These anastomoses can be widen and become functional when there is a pressure gradient between bronchial and coronary circulation, as in occlusive coronary disease. There have been documented cases of bronchial to coronary artery anastomosis following or prior to embolization of the bronchial artery.

In this case, the aberrant left bronchial artery arising from the left common carotid artery was linked by a communicating channel to the left bronchial artery. Before embolization of the bronchial artery, visualization of the aberrant bronchial artery after selective left bronchial arteriography was not possible. During left bronchial artery embolization, as distal flow disappeared, retrograde filling of the aberrant bronchial artery was demonstrated. As in our case, the aberrant bronchial artery arising from the carotid artery, with a communicating channel to the bronchial arteries, can cause non-target organ embolization during bronchial embolization. If embolization particles pass through the aberrant bronchial artery to the carotid artery, embolic strokes may occur.

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총경동맥에서 기시하는 이소성 기관지 동맥 : 1예 보고[1]

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이준우 · 천정은 · 김현범 · 정진욱 · 박재형

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한 일 학 회

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사전등록비 : 없음

6월 9일(금)

13:00- 등 록
14:00-18:00 일반연제 발표
15:00-17:00 Korean-Japanese Society of Uroradiology Meeting
Special Lectures & Panel Discussion
See attached meeting schedule

6월 10일(토)

8:00-10:00 일반연제 발표
10:00-12:00 특강 (Imaging and Intervention of GI System)
Ⅰ. Taro Takahara, M.D.(Kyorin University School of Medicine)
" MR Imaging of Bowel Obstruction "
Ⅱ. Hae Giu Lee, M.D.(Chatholic University Medical College)
" Imaging Diagnosis of Infectious Bowel Disease "
Ⅲ. Hiromu Mori, M.D. (Oita Medical School)
" Imaging of Pancreatic Veins for Preoperative Staging of Pancreatic Carcinomas "
Ⅳ. Jae Hyung Park, M.D. (Seoul National University College of Medicine)
" Vascular Intervention of the Liver, Except HCC "
13:30-18:30 미니관광
성읍 민속마을 -> 여미지 식물원

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