

Hemothorax complicating bronchial artery aneurysm

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An elderly patient presented with spontaneous hemothorax. Workup identified a right-sided bronchial aneurysm as the source, which was successfully embolized. Bronchial aneurysms can be managed by interventional techniques, although the choice of approach depends upon the clinical and anatomical settings.

Key Words: *Aneurysm; Bronchial artery; Embolization; Hemothorax*

Bronchial artery aneurysms, whether mediastinal or intraparenchymal, are uncommon and usually associated with chronic inflammatory lung disease or systemic vascular conditions. They may mimic esophageal tumours or thoracic aneurysms, or present with hemorrhage, primarily in the form of hemoptysis. Occasionally, they may present as a hemomediastinum and, rarely, a hemothorax. Endovascular approaches offer a less invasive method with potentially lower morbidity compared with thoracotomy.

CASE PRESENTATION

A 78-year-old woman presented to an outside institution with myalgia and weakness. Her past medical history was significant for tuberculosis decades earlier. An elevated creatinine phosphokinase and erythrocyte sedimentation rate suggested the diagnosis of polymyositis, and she was started on a course of steroids with symptomatic improvement. However, a chest radiograph revealed pleural thickening and a screening computed tomogram demonstrated a moderate pleural effusion of blood density and a mass consistent with a right-sided bronchial artery aneurysm (1.6 cm in diameter). This was coincident with a drop in hematocrit from 32% to 23%, and a pleural tap that was reported to be bloody. The patient was transferred to the University of Washington Medical Center, where, on arrival, she was stable. A review of the films noted apical scarring in addition to the aforementioned findings. Thoracic angiography was performed, revealing feeding vessels arising from the arch of the aorta and the right second intercostal artery (Figure 1). No other collateral vessels feeding the aneurysm were found. Having selected the arch vessel with a 5 Fr vertebral artery catheter, the aneurysm was crossed with a 3 Fr microcatheter, through which two 2×3 coils were deployed into the second intercostal artery, and two more in the arch vessel, thus excluding the aneurysm (Figures 2 and 3).

Anévrisme de l'artère bronchique compliqué d'un hémotorax

Un patient âgé a été amené pour hémotorax spontané. Les examens et analyses ont permis d'identifier un anévrisme bronchique droit comme source du problème, lequel a été embolisé avec succès. Les anévrismes bronchiques peuvent être traités par technique d'intervention, bien que le choix de l'approche dépende du contexte clinique et anatomique.

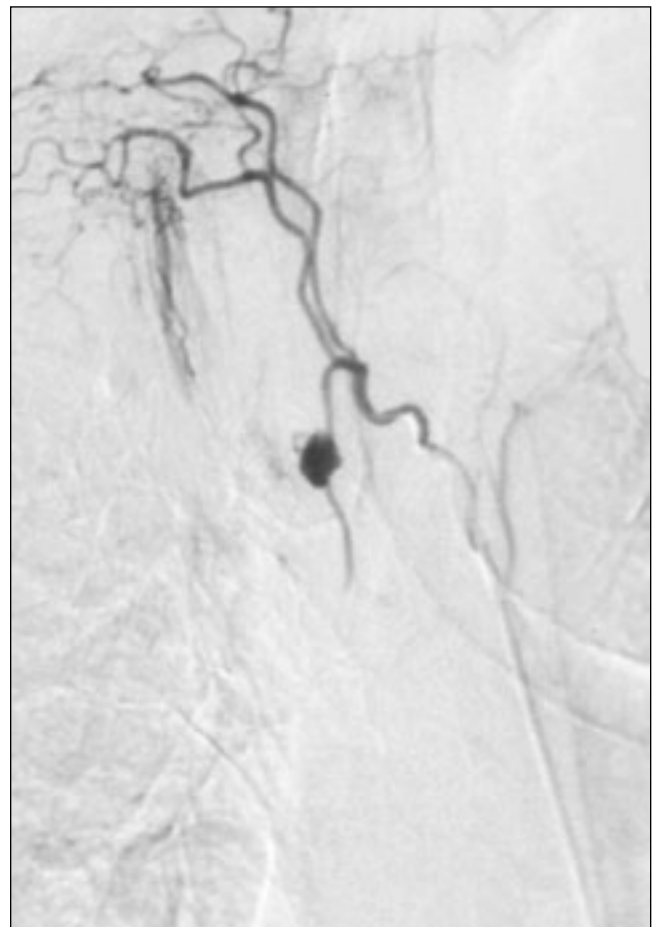


Figure 1) Selective angiogram of right bronchial artery arising from the arch of the thoracic aorta of a 78-year-old woman with hemothorax

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Figure 2) Right bronchial artery and bronchial artery aneurysm crossed with microcatheter

Subsequently, the patient was diagnosed as having temporal arteritis, although the diagnosis of polymyositis could not be confirmed. Steroids were not restarted, and at 11 months follow-up she had no recurrence of bleeding or of the aneurysm.

DISCUSSION

Bronchial artery aneurysms may present as asymptomatic masses, but are more commonly diagnosed after complications occur (1). Not uncommonly, patients have a history of chronic inflammatory disease, ranging from arteritis to chronic bronchitis (1). This suggests that the etiology may be chronic inflammation surrounding, or directly involving, the artery (2). Asymptomatic lesions may present as esophageal masses, with or without compression, thus prompting workup for malignancy or leiomyoma (3,4). They can also mimic the radiographical appearance of aortic aneurysms (5). Size does not predict the risk of complications because lesions as large as 8 cm to 10 cm in diameter can present with radiographical findings only, while those as small as 2 cm have presented with life-threatening bleeding (3,6,7). The most common hemorrhagic presentation is hemoptysis, followed by hematemesis, depending on whether the aneurysm extends parenchymally or posteriorly (5,8,9). Massive hemomediastinum is less common and hemothorax is the least common mode of presentation (6,7). The primary diagnostic modes are computed tomographic angiography, intra-arterial angiography and, occasionally,



Figure 3) Repeat selective angiogram of the right bronchial artery after coil embolization of both the second intercostal and supreme intercostal arteries supplying the bronchial aneurysm. Occlusion of the aneurysm is demonstrated

magnetic resonance imaging in confusing cases (1). Because the majority of reports describe complications arising from bronchial artery aneurysms, there is a sense that even asymptomatic lesions should be treated (1). There are three treatment options. Open ligation, with or without cardiopulmonary bypass, has been used particularly in unstable patients with massive hemomediastinum and in shock (7,8). Ligation of the artery could also presumably be considered in patients where the aneurysm is accessible by thoracotomy, and where less invasive methods have failed and/or there are other indications for thoracotomy. Endovascular stent grafts of the thoracic aorta, with or without concomitant embolization, have also been described, particularly in cases where the bronchial artery arises from the underside of the distal arch (5,10). This approach may be needed because it may not be possible to cannulate the vessel and, in the distal arch, it may be possible to avoid completely crossing the origin of the left subclavian artery. Embolization offers an attractive, minimally invasive approach that can be performed in emergent settings (1). Recognizing variations in bronchial arterial anatomy is critical under any circumstances and, in this regard, it was intriguing that, as in our case, an origin arose from the underside of the arch (5,11). Although most reports describe the use of coils, biological glue has also been successfully used (6). The success and complication rate of embolization, specifically in the setting of a bronchial artery aneurysm, is difficult to assess given the

paucity of data; however, in general, some observations based on bronchial embolizations are possible. To be able to perform the procedure, it must be possible to maintain the catheter position in the artery, to determine that spinal collaterals do not arise from the target vessel, or if they do, to be able to pass well distally to the origin of the spinal collaterals (2). Failure rates of 20% to 30% have been described, particularly if collateral vessels fail to be identified (2). Of particular note, patients who have chronic pleural thickening (as in our case) consistent with chronic inflammation (as in the majority of patients who have bronchial artery aneurysms) are at particular risk for systemic collateralization and the subclavian, vertebral and mammary arteries should be studied to rule out other feeding branches.

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CONCLUSIONS

Bronchial artery aneurysms appear to arise from chronic inflammatory conditions. Although the data are biased, it appears that they eventually become symptomatic. We believe that a reasonable approach is to begin with embolization. If this is not possible or if there is recurrence, repeat attempts can be performed, paying attention to find any missed collaterals. However, if possible, endografting the section of the aorta from which the feeding vessel arises is an acceptable next step. Both of these options are possible in the emergent setting, but in patients in frank shock with massive bleeding, or who have failed noninvasive approaches or who have another indication for thoracotomy, operative ligation is appropriate.



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