Letter to Editor

Ligation is Not Enough to Secure the Aortic End of the Anomalous Systemic Artery

Dear Editor,

Anomalous systemic arterial supply to normal basal segments of the left lower lobe is a rare congenital anomaly.[1] In patients with this anomaly, although the bronchial anatomy is normal, the basal segments receive systemic arterial blood supply from the aorta. Although surgery is the conventional treatment option for this condition,[2] detailed techniques and perioperative managements were rarely addressed. We report two consecutive cases of this anomaly treated with the same operative method, but ending with the different outcomes.

Case 1

A 23-year-old non-smoking man was referred to our hospital because of recurrent hemoptysis that he began experiencing 2 years ago without any particular cause. Computed tomography (CT) scan revealed a few asymmetrical dilated vessels in the left lower lobe and the CT angiogram demonstrated an enlarged tortuous artery arising from the descending aorta and perfusing the left basal segments. He underwent a video-assisted thoracoscopy assisted operation to eliminate the symptoms. After dissection, the anomalous vessel was doubly ligated with No. 1 silk suture at the proximal end. A transfixation suture ligation was made between the two ligatures before division and then, the left lower lobe was removed. After the operation, the patient was transferred to intensive care unit ward. Two hours later, the massive blood, suddenly drained out (about 3000 ml) from the chest tube and the blood pressure dropped sharply to zero within several minutes. Emergency operation was performed promptly, revealing the ruptured aortic stump of the divided aberrant vessel. Although repair was accomplished with a continuous No. 4-0 Prolene suture, the patient died from the shock and the cardiac arrest unfortunately.

Case 2

An 18-year-old nonsmoking man was referred to our hospital because of two episodes of hemoptysis within 1 month. The CT angiogram also confirmed an aberrant vessel rising from the descending aorta above the diaphragm, irrigating the left lower lobe [Figure 1]. Intraoperative exploration findings mimicked that was seen in case 1 [Figure 2] and the same surgical method was performed: Aberrant artery division plus left lower lobectomy; however, with more cautions to the vessel handling. A 3-0 Prolene purse-string suture was placed on the aorta wall where anomalous vessel arose. Systolic arterial blood pressure (SBP) was set to 80 mmHg temporarily with intravenous nitroglycerin. Then, the vessel was divided, the proximal end was oversewn with 3-0 Prolene and the purse-string tied up. In the first post-operative 24 h,

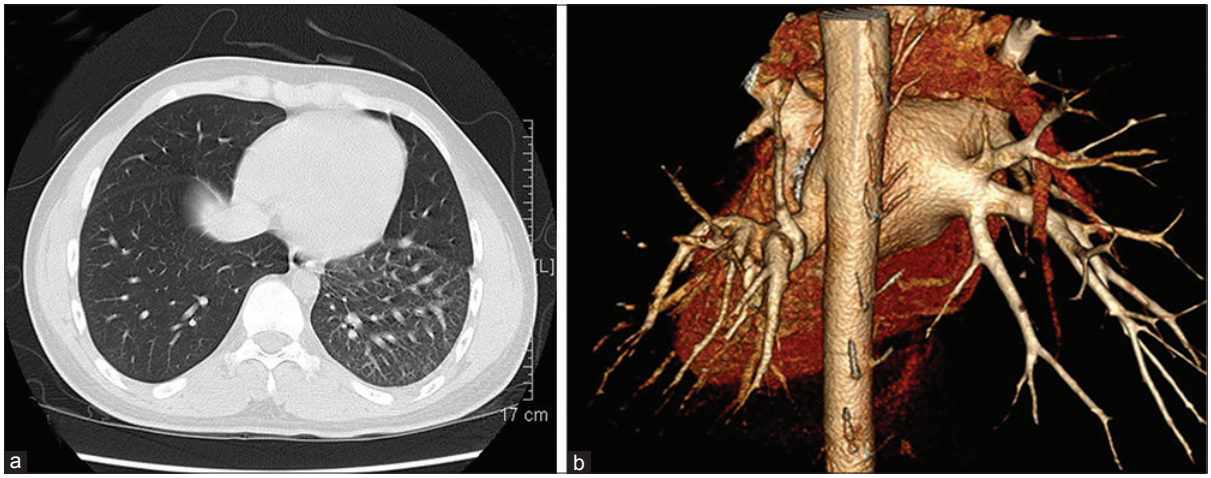

Figure 1: Axial CT through lower lobes of lungs in lung window. (a) Diffuse dilatation of intrapulmonary peripheral vasculature, areas of ground-glass opacity and mild decrease in volume were noted in the involved basal segments. (b) Three-dimensional reconstruction from the CT angiogram showing the anomalous systemic artery arising from the thoracic aorta, supplying basal segments of the left lower lobe

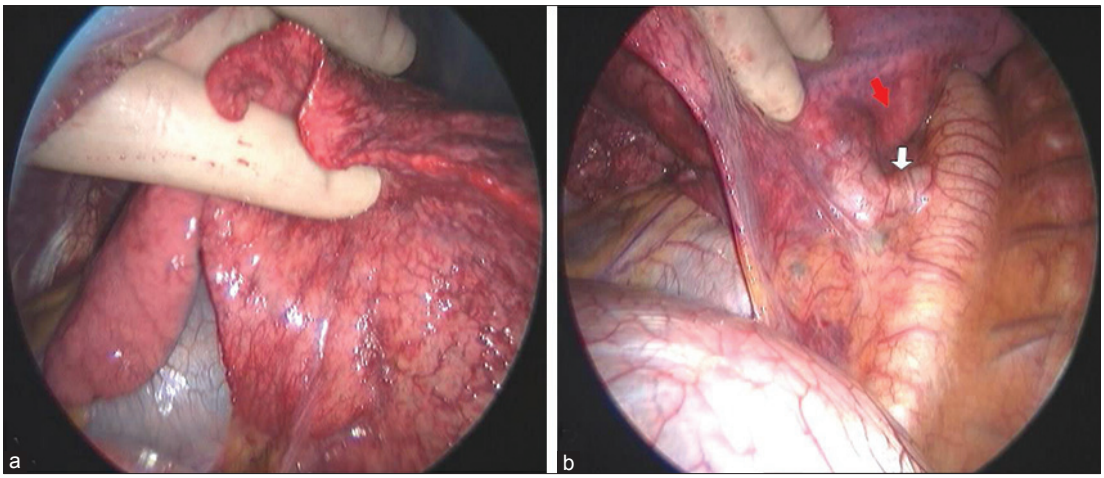

Figure 2: (a) Telangiectasia on the visceral surface of basal segments. (b) The anomalous artery (white arrow) arose beneath inferior pulmonary vein (red arrow) from the anterolateral aspect of the descending aorta, forming an aneurism before entering the left lower lobe

sedative was given to keep the patient calm and the SBP was kept within 90-110 mmHg. The patient's post-operative recovery was uneventful, and he was discharged on the 6th post-operative day. The patient has been followed uneventfully for 7 months and the complaints of hemoptysis and general fatigue disappeared.

Anomalous systemic arterial (ASA) supply to apparently normal lung without sequestration is the rarest form of congenital abnormality of the pulmonary blood supply.[1] The basal segments of the left lower lobe are more frequently involved and the most common pattern of anomalous systemic artery to the lung arises from the descending thoracic aorta.[1,3] CT of the thorax is the most useful test in evaluation of suspected cases as it consistently demonstrates the key characteristics of ASA, both a normal bronchus branching pattern and the aberrant system-originating arteries to the lungs.[4] Conventional aortography is usually unnecessary for proper diagnosis of this anomaly.[5,6]

Although transcatheter embolization of the aberrant vessel is an optional treatment, surgery remains the best for ASA patients.[7,8] Post-operative massive hemorrhage from the aorta is devastating; however, scant archive underlined the importance of vessel handling techniques[9] and perioperative managements. The aberrant arteries in this disease are distinct from bronchial arteries, histologically having an elastic-type (so-called pulmonary type) arterial wall.[2,4] However, the pressure imposed on the misplaced "pulmonary artery" is much higher than pulmonary pressure. In the first case, even triple ligation could not prevent the accidental vessel stump laceration. In case 2, we ligated, divided the vessel under controlled hypotension and purse-sutured the stump carefully and furthermore post-operative sedation and the blood pressure control was warranted. That might be the key points for the patient's uneventful recovery.

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