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Lung: Case Report

Transthoracic Removal of Pulmonary Artery Foreign Body by Percutaneous Balloon Occlusion

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Removal of a foreign body in the pulmonary circulation is typically attempted by an endovascular approach as the first attempt. The pulmonary artery must be occluded either manually or with cardiopulmonary bypass during the procedure. Here, we report a case of video-assisted thoracic surgery to remove a foreign body from the right pulmonary artery under percutaneous balloon artery occlusion.

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For difficult cases, a foreign body in the right pulmonary artery can be retrieved with video-assisted thoracic surgery (VATS) under percutaneous balloon artery occlusion. Intravenous catheterization is often the first attempt to remove a foreign body in the pulmonary circulation. In cases of anticipated difficulty with an endovascular approach, operation must be conducted to retrieve the foreign body. During the operation, the pulmonary circulation must be temporarily suspended either by manually closing off the pulmonary artery or with cardiopulmonary bypass. We here report the removal of a foreign body in the right pulmonary artery with VATS under percutaneous balloon artery occlusion.

A 67-year-old woman underwent lumbar spinal canal decompression. During the operation, an interbody fusion cage (20 × 11 × 9 mm; Figure A) was accidentally dislodged into the inferior vena cava. Intraoperative fluoroscopy showed migration of the foreign body to the right pulmonary artery, but there were no signs indicative of pulmonary embolism. The operation was completed as planned. Computed tomography of the chest confirmed the fusion cage in the middle trunk of the right pulmonary artery as well as some thrombosis proximal to the foreign body (Figure B). Retrieval of the foreign body was postponed until 8 days later because of the use of anticoagulants and high risk of bleeding.

Owing to the size and shape of the fusion cage, we anticipated technical difficulty and did not attempt to remove it with intravenous catheterization. Instead, we designed a plan to remove the fusion cage with VATS under percutaneous balloon artery occlusion. Briefly, VATS was conducted under general anesthesia with double-lumen endotracheal intubation. The operation port was in the seventh intercostal space at the midaxillary line, and the observation port was in the fifth intercostal space at the midaxillary line. A balloon catheter was placed in the main trunk of the right pulmonary artery under the guidance of digital subtraction angiography. After the fusion cage was visualized with fluoroscopy, the balloon was inflated. The region of the right pulmonary vein was exposed with relative ease because of the deep lung fissure in this patient. A longitudinal incision was made to the pulmonary artery, and a neural probe was used to remove the fusion cage and to extract the thromboemboli. After the pulmonary artery incision was closed with 4-0 Prolene suture, the balloon was deflated and retrieved (Video). Fluoroscopy revealed complete patency of the pulmonary artery, and the incision was closed. The operation lasted for 190 minutes, and total occlusion time was approximately 20 minutes. The patient received routine anticoagulation therapy for 2 days and was discharged 1 week later. At the 1-month follow-up, computed tomography angiography showed no pulmonary artery stenosis or thrombosis.

COMMENT

In most cases, a foreign body in the pulmonary circulation can be successfully retrieved by a nonsurgical endovascular approach.[1] Because of its position and short course, the pulmonary artery must be occluded manually under thoracotomy in cases that require

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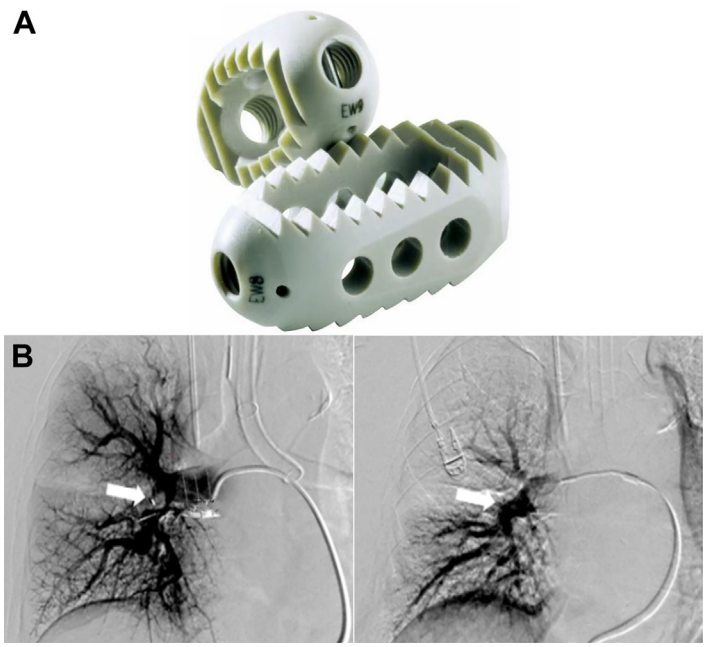

FIGURE (A) Foreign body. (B) Angiography images (left) before and (right) after operation. The white arrow on the left indicates the location of the foreign body in the pulmonary artery, while the right indicates the recovery of blood supply in the pulmonary artery after the foreign body is removed.

operation (eg, a large or heavy foreign body with smooth surface). Cardiopulmonary bypass is an alternative but is associated with a variety of complications.[1]

This report describes successful removal of a foreign body from the pulmonary circulation with VATS under percutaneous balloon occlusion of the pulmonary artery. The advantages of this approach include less traumatic injury vs thoracotomy, avoiding the complications associated with cardiopulmonary bypass, and prevention of possible migration of the foreign body during the operation.

The Video can be viewed in the online version of this article [https://doi.org/10.1016/j.atssr.2023.02.015] on http://www.annalsthoracicsurgery.org.

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DISCLOSURES

The authors have no conflicts of interest to disclose.

PATIENT CONSENT

This study was approved by the Ethic Review Board of The Second People's Hospital, Shenzhen. Written informed consent to publish this manuscript was obtained from the patients.

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