

Case report

Endovascular embolization prior to surgical resection of symptomatic intralobar pulmonary sequestration in an adult

Jernej Avsenik^a, Tomaž Štupnik^b, Peter Popovič^{a,*}^a Clinical Institute of Radiology, University Medical Centre Ljubljana, Zaloska 7, 1000 Ljubljana, Slovenia^b Department of Thoracic Surgery, University Medical Centre Ljubljana, Zaloska 7, 1000 Ljubljana, Slovenia

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ABSTRACT

Intralobar pulmonary sequestration is a rare congenital malformation, conventionally managed by surgical resection. Recently, the endovascular embolization has been proposed for the definite treatment of this disease. Additionally, preoperative embolization of aberrant arteries to minimize the risk of serious intraoperative haemorrhage has also been described. We report the case of 43-year old female patient who presented with cough and haemoptysis, and was successfully treated with endovascular embolization followed by a Video-assisted thoracoscopic wedge resection.

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1. Introduction

Intralobar pulmonary sequestration (ILS) is a rare malformation characterised by non-functioning lung tissue, separated from the tracheobronchial tree. ILSs receive a systemic artery supply from the descending thoracic aorta, abdominal aorta, the celiac trunk or from intercostal arteries [1]. Diagnosing ILS is based on imaging and identifying the systemic arterial supply. Haemoptysis and/or recurrent infections are present in two-thirds of patients [2,3]. The classical therapeutic approach is surgical resection in which the abnormal lung tissue is removed thus giving no opportunity for complications like ischemic infarction or abscess formation [4,5]. However, inadvertent injury of the aberrant artery can cause a severe and potentially life threatening haemorrhage during pulmonary resection. To overcome this problem, preoperative embolization of aberrant systemic arteries with metallic coils or vascular plugs, followed by surgical resection, has recently been proposed [6]. Additionally, the endovascular embolization as a definite therapy of ILS has also been described [7–9]. We present a case of an adult with ILS in whom endovascular embolization using a combination of metallic coils and vascular plugs was performed to allow a safe surgical resection.

Abbreviations: ILS, intralobar pulmonary sequestration; CTA, computed tomography angiography; MRI, magnetic resonance imaging; VATS, video-assisted thoracoscopic surgery; AVP, Amplatzer Vascular Plug.

* Corresponding author at: University Medical Centre Ljubljana, Clinical Institute of Radiology, Zaloska cesta 7, Ljubljana 1000, Slovenia.

E-mail addresses: peter.popovic@kclj.si, ppopovic856@gmail.com (P. Popovič).

2. Case report

43-year old female with history of asthma and recurrent respiratory infections presented with cough and massive haemoptysis. Physical findings, laboratory results and chest radiography were normal. To exclude pulmonary embolism, multidetector computed tomography angiography (CTA) was performed, revealing an area of consolidation with cystic components in posterior basal segment of the left lung. Two nutrient arteries were seen arising from the left side of the descending thoracic aorta, following a transverse course toward the abnormal lung parenchyma, with venous drainage via the inferior pulmonary vein (Fig. 1a). Despite the antibiotic and antitussive therapy, the patient eventually got worse and was transferred to thoracic surgery department. In collaboration with interventional radiologist, the endovascular treatment of ILS was proposed to control the bleeding. After local anaesthesia, a short 5 F introducer sheath (Terumo Europe N.V., Belgium) was put in place via the right transfemoral route. Prior to embolization, aortography confirmed the presence of the two nutrient arteries, which were selectively catheterized with a 5 F catheter (Sidewinder[®], Terumo Europe N.V., Belgium) (Fig. 1c and d). The 0.035 stiff straight 260 cm long guidewire was left in the nutrient arteries and the short 5 F introducer sheath was replaced with a long (55 cm) 7 F introducer sheath (Cordis Corp., Miami, FL, USA). A 2.4 F microcatheter (Progreat[®], Terumo Europe N.V., Belgium) was then superselectively positioned throughout 5 F Sidewinder catheter in the feeding arteries before embolization with coils. The small distal branch of the upper vessel was embolized with 2 × 3 mm pushable coils (VortX-18 fibered platinum coil, Boston Scientific, Cork, Ireland) and in the proximal part of the artery,

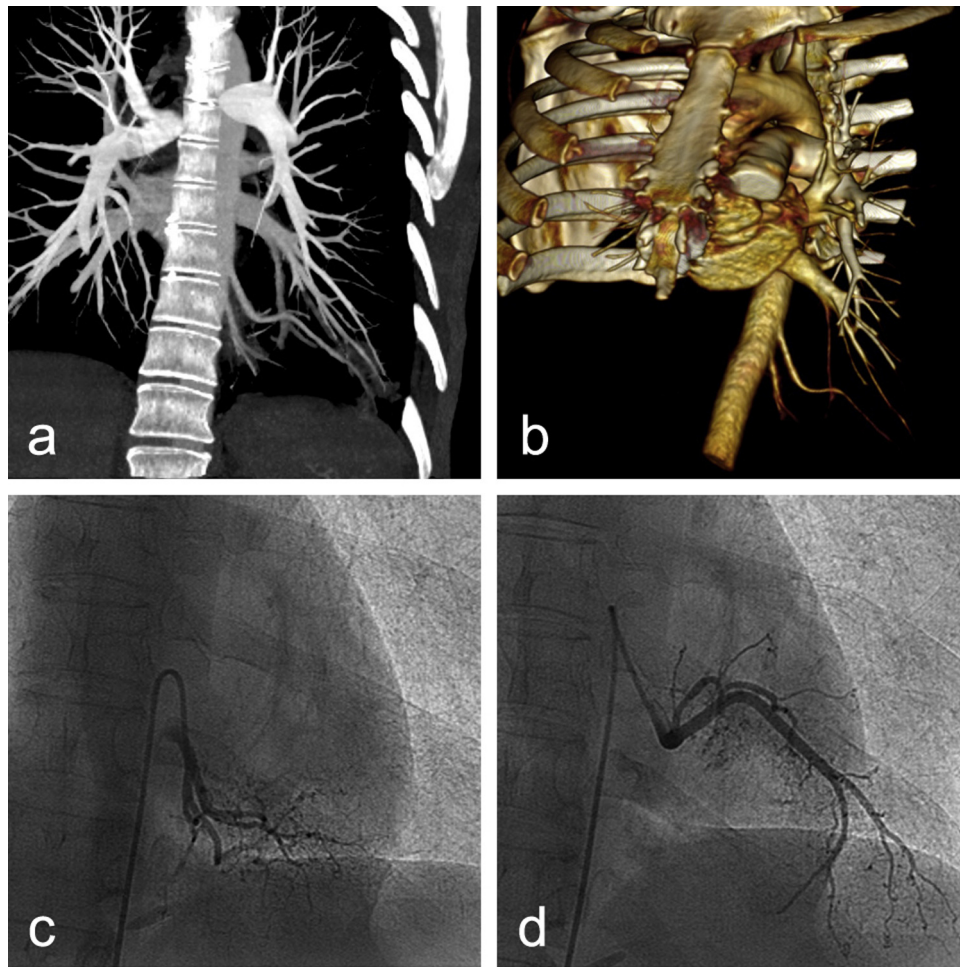


Fig. 1. Two nutrient arteries arising from descending thoracic aorta and transverse laterally toward consolidated lung parenchyma are shown on coronal maximum intensity projection (MIP) reconstruction (a) and on 3D volume rendered image (b); findings are consistent with intralobular pulmonary sequestration. Selective angiography confirmed the diagnosis, showing in detail the lower (c) and upper (d) aberrant artery.

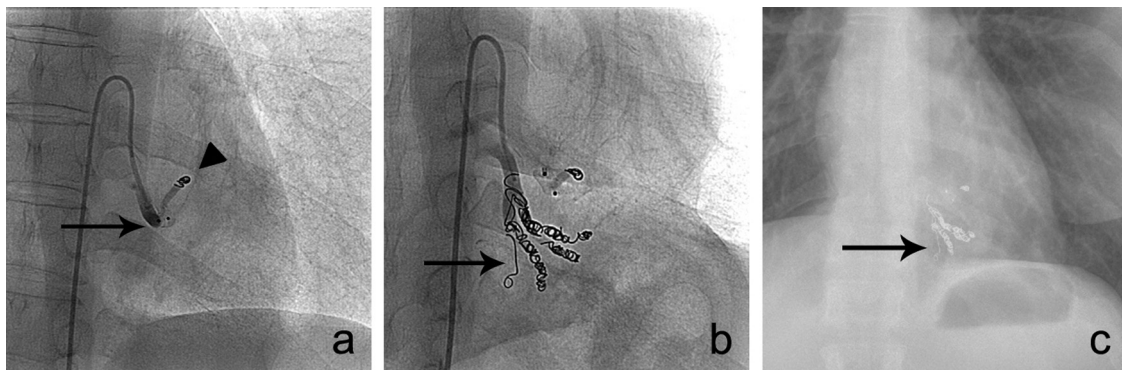


Fig. 2. Postembolization control confirms total occlusion of upper aberrant artery (a) with Amplatzer Vascular Plug (arrow) and coil (arrowhead). Lower artery (b) was successfully embolized with coils (arrows). Control chest radiography 10 days after procedure is normal (c); embolization material is seen in medial aspect of left basal lung (arrow).

the 6 mm Amplatzer Vascular Plug (AVP; AGA Medical, Plymouth, MN, USA) was deployed. We selected AVP approximately 30% larger than the vessel diameter for secure fitting, prevention of device migration, and total occlusion. Selective angiography of the lower artery revealed four distal branches, which were subsequently closed through microcatheter with 2 × 3 mm and 4 mm pushable coils (Vortex-18 fibered platinum coils, Boston Scientific, Cork, Ireland Boston). In the proximal part of the artery, the

6 mm detachable coil was used (Interlock-18, fibered platinum coil, Boston Scientific, Cork, Ireland Boston). The control angiogram confirmed successful occlusion of the aberrant arteries (Fig. 2). No incident or complication occurred during the procedure. During the hospitalization patient was observed in semiintensive care unit and no clinical symptoms were present. Antibiotics were administered during hospitalization to prevent any septic events and non-steroidal anti-inflammatory drugs were used for analgesia. The

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