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## Interventional Radiology

# Balloon occlusion technique with ethylene vinyl alcohol for the treatment of a pediatric pulmonary artery mycotic aneurysm

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## ABSTRACT

Mycotic aneurysms, which may occur anywhere in the body, may be prone to spontaneous rupture. Antibiotic therapy combined with surgical debridement without or with revascularization has been described as potential treatment options. This report describes a combined balloon occlusion technique with the injection of ethylene-vinyl alcohol copolymer for the treatment of a mycotic aneurysm of the pulmonary artery secondary to infective endocarditis. Similar techniques have been described in the cerebral circulation and may obviate concerns for coil erosion, non-target embolization, or superinfection.

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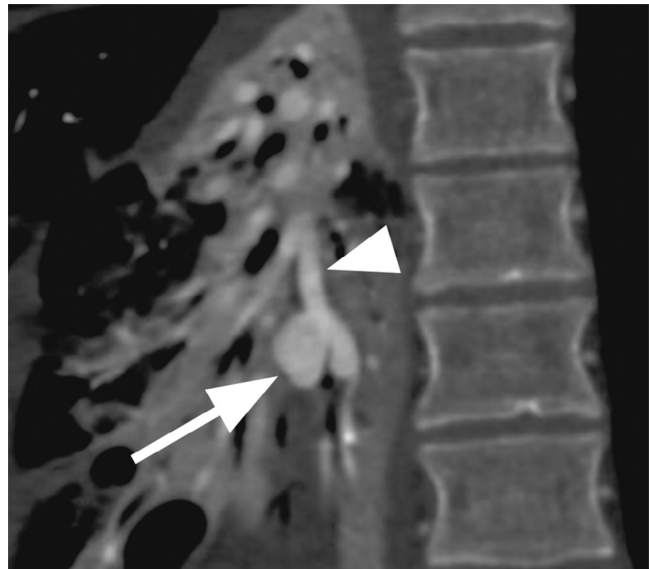
## Introduction

A mycotic aneurysm is an aneurysm resulting from a bacterial infection of the arterial wall. It is a common complication because of hematogenous spread of a bacterial infection and often occurs in the setting of endocarditis [1]. A mycotic aneurysm can occur anywhere in the body; however, the most common locations include the thoracic and abdominal aorta as well as abdominal visceral, intracranial, lower extremity, and pulmonary arteries [1]. Degeneration of the vessel wall secondary to infection results in an unstable aneurysm prone to rupture [1]. Standard treatment of a mycotic aneurysm is antibiotic therapy combined with surgical debridement without or with revascularization [2]. This report describes a pediatric patient with congenital heart disease that developed a mycotic aneurysm of the pulmonary artery secondary to infective endocarditis who was successfully treated with embolization using the balloon occlusion technique with the injection of ethylene-vinyl alcohol copolymer (EVOH) (Onyx, Ev3, Irvine, CA). Institutional review board approval was obtained before preparation of this report.

## Case report

A 13-year-old girl with history of DiGeorge syndrome, prior neonatal truncus arteriosus repair, and severe left pulmonary artery hypoplasia presented with methicillin-sensitive staphylococcal bacteremia secondary to infective endocarditis complicated by septic pulmonary emboli, bilateral pyelonephritis, and septic shock. Because of worsening respiratory failure and pulmonary hemorrhage, the patient was placed on venovenous extracorporeal membrane oxygenation (V-V ECMO). Six days after placement on V-V ECMO, acute hemorrhage was noted around and in the right chest tube and also in the endotracheal tube. Computed tomography angiography showed a patent conduit between the right ventricle and the pulmonary artery, an acute right hemothorax, and a 19-mm bilobed presumed mycotic aneurysm involving the medial basal segment of the right lower lobe pulmonary artery (Fig. 1). In addition, extravasation was noted from an intercostal artery at the site of the right chest tube.

The patient was placed under general anesthesia with additional support from a perfusionist team to manage her ECMO circuit. Left common femoral vein access was obtained antegrade using a micropuncture set, and a 9-French, 70 cm Flexor sheath (Cook Medical; Bloomington, IN) was placed into the inferior vena cava. A 7-French APC catheter (Cook Medical) was used to select the main pulmonary artery. Digital subtraction arteriography revealed a patent pulmonary artery conduit (Fig. 2) and confirmed the presence of a 19-mm bilobed mycotic aneurysm arising from the medial basal segment of the right lower lobe pulmonary artery (Fig. 3). The guiding sheath was advanced further into the right pulmonary artery, and a 5-French, 100 cm vertebral tip catheter (AngioDynamics; Latham, NY) and angled tip Glidewire (Terumo; Tokyo, Japan) were used to cannulate the branch vessel feeding the mycotic



**Fig. 1 – Computed tomography image shows a 19-mm aneurysm (arrow) arising from the medial basal segmental branch of the right pulmonary artery (arrowhead).**

aneurysm. Given the patient's history of endocarditis and acute hemorrhage in the endotracheal tube, the thought was this most likely represented a friable mycotic aneurysm, which would be prone to rupture with any significant manipulation. Based on this, a decision was made to occlude the mycotic aneurysm using the balloon occlusion technique with the injection of EVOH (Onyx). A 150-cm, Scepter C Occlusion Balloon



**Fig. 2 – Digital subtraction pulmonary arteriogram showing the anastomosis (arrow) of the revised right ventricular to pulmonary artery conduit for truncus arteriosus.**

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