A Rare Case of Mycotic Pulmonary Artery Aneurysm Complicated by Infective Endocarditis in Association with Ventricular Septal Defect

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Abstract

We present a case of a 3-year-old child with ventricular septal defect and infective endocarditis with mycotic pulmonary artery aneurysm. The case highlights the role of CT angiography in the diagnosis and characterization of aneurysm and in demonstrating the extent of thrombo-embolic complications in distal pulmonary arteries and lung parenchyma.

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Abstract:

We present a case of a 3-year-old child with ventricular septal defect and infective endocarditis with mycotic pulmonary artery aneurysm. The case highlights the role of CT angiography in the diagnosis and characterization of aneurysm and in demonstrating the extent of thrombo-embolic complications in distal pulmonary arteries and lung parenchyma.

Manuscript:

A 3-year old male child with Ventricular septal defect (VSD), diagnosed at 3 months of age, now presented with respiratory distress, cough, facial puffiness and swelling of bilateral legs. Transthoracic echocardiography demonstrated vegetations on tricuspid and pulmonary valves and the child was diagnosed to have Infective endocarditis (IE) and being treated for the same. Chest radiography performed as a part of imaging workup demonstrated a well- defined, lobulated peri-hilar opacity in the left lung. Computed tomography angiography (CTA) was performed for further evaluation, suggesting the peri hilar nodular opacity to be a saccular pseudoaneurysm arising from left descending pulmonary artery (LDPA), indicating a mycotic aneurysm formation in the setting of IE **(Figures 1a & 1b).** Non-enhancing hypoechoic lesions with fronded appearance are seen along tricuspid and pulmonary valves which are compatible with vegetations **(Figures 2a & 2b).** Multiple filling defects were noted in segmental and sub-segmental branches of bilateral lower lobe pulmonary arteries, which were attributed to septic pulmonary emboli and bilateral lungs demonstrated multiple cavitary and non-cavitary nodules compatible with septic emboli

(Figures 2c & 2d).

The present case demonstrates a rare combination of mycotic pulmonary artery aneurysm (MPAA) in the setting of congenital heart disease (CHD) and IE. In a congenitally malformed heart, due to turbulence and sheer force in the blood, the endocardium gets disrupted resulting in seeding of pathogenic organisms in scarred endocardium, predisposing to development of vegetations and IE. MPAA are formed in such conditions as a result of the direct extension of intraluminal septic thrombo-embolus into the vessel wall. The most common CHD associated with MPAA are PDA,VSD and corrected Tetralogy of Fallot (TOF), in addition to intravenous drug abuse and connective tissue disorders. [1,2]‘ The most important differential diagnosis for MPAA occurring in the background of CHD and IE is Rasmussen’s aneurysm. The latter is located in relation to tuberculous cavity and usually distributed beyond the branches of the main pulmonary arteries in contrary to aneurysm in CHD where it is located more proximally involving lobar branches. The management of these patients is difficult due to a lack of clear guidelines and sparse clinical experience. The prognosis for mycotic aneurysms of the pulmonary arteries without intervention is horrid with mortality rates ranging from 40–82% due to rupture. Prompt diagnosis and timely management is essential to prevent rupture and catastrophic haemorrhage in these patients. This case highlights the role of CTA in the evaluation of patients with IE and suspected MPAA as it outpaces TTE not only in terms of characterization of the aneurysm but also in demonstrating the extent of thrombo-embolic complications in distal pulmonary arteries and lung parenchyma.

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Figure legends:

Figure 1: Axial MIP image (A)**,** Volume rendered image (B) of CT angiography show saccular pseudoaneurysm from the left descending pulmonary artery. [**PT** : Pulmonary trunk;,**RPA:** Right pulmonary artery, **LPA:** Left pulmonary artery]**.**

Figure 2: Axial MIP images (A,B), Axial images in lung window (C,D) of CT angiography show vegetations along pulmonary valve (black arrow) and tricuspid valve (arrow head) along with emboli in segmental pulmonary artery branches (white arrow). Bilateral lungs show mosaic perfusion along with multiple septic emboli. [**Ao** : Aorta;**PV** : Pulmonary valve; RA: Right atrium, **RV:** Right ventricle, **LA:** Left atrium, **LV** : Left ventricle].