



A Rare Case of Extensive Mycotic Aneurysm of Branch Pulmonary Arteries and Ductus arteriosus Due to Ductus Arteritis with Descending Aorta with Thrombus

KEYWORDS

Aneurysm, Infected Pulmonary Artery, Endocarditis, Multidetector Computed Tomography

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ABSTRACT *Infective endocarditis originating from patent ductus arteriosus is lethal at times and bilateral pulmonary arterial mycotic aneurysm formation from showering of vegetation uncommon. The formation of aneurysm of upper descending aorta is rare in such cases. We report a case of extensive mycotic aneurysm of bilateral branch pulmonary arteries along with huge vegetation load in upper descending aorta probably due to ductal arteritis of a 7 years old girl. Aneurysmal dilatation was noted in bilateral branch pulmonary system and in patent ductus arteriosus. The child presented with pyrexia of unknown etiology under investigations. Multidetector Computed Tomography of chest gave us the conclusive diagnosis.*

Introduction

The incidence of right-sided heart endocarditis is 5-10% among all cases of infective endocarditis¹. There are only a few reports on vegetation involving branch pulmonary artery without involving tricuspid or pulmonary valve. The incidence of infective arteritis of patient with untreated patent ductus arteriosus (PDA) is less than 1%². The pulmonary showering from infected PDA vegetation is not uncommon. But we report a case of extensive mycotic aneurysm of bilateral pulmonary arterial system and a small saccular aneurysm of upper descending aorta with huge thrombus load which was originated from infected aneurysmal PDA.

Case report

A 7-year-old female child was admitted for evaluation for complaints of high fever, cough and increasing breathing difficulties for 1 month duration. At admission, her haemoglobin was 8.3gm/dl, white blood cell count was 23,000/mm³, erythrocyte sedimentation rate (ESR) was 80 mm/h, CRP was 40 mg/dl and creatinine was 0.2 mg/dL. The respiratory rate was 40/min, arterial blood pressure was 100/70 mmHg, pulse rate was 140 beats/min with saturation of 90% in room air. Three serial blood cultures were negative for any organism. On physical examination she had hyperdynamic precordium and normal heart sounds. Chest X-ray showed aneurysmal dilatation of pulmonary artery area, an area of radio opaque shadow over right lower zone along with bilateral perihilar fluffy infiltration. Echocardiography showed a large aneurysmal patent ductus arteriosus with left to right shunt, large (?) thrombotic load of

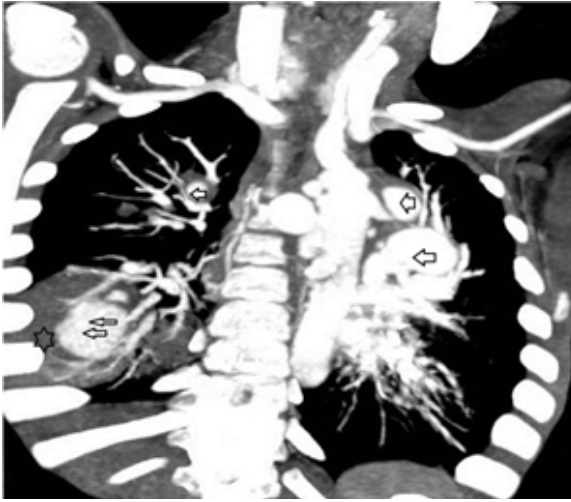
both branch pulmonary arteries and high pulmonary arterial pressure (Peak Systolic Pressure 80 mmHg). There was no evidence of vegetation in right chambers of heart.

A multidetector pulmonary computed tomography with iodinated contrast injection was performed for further evaluation. It revealed large hypodense intraluminal filling defects, suggesting a thrombus or vegetation at right pulmonary artery, left pulmonary artery, patent ductus arteriosus and, upper and mid descending thoracic aorta (Figure 1A and 1B). The branch pulmonary arteries shows irregular wall thickening with saccular aneurysm of left pulmonary artery (LPA) at junction of the PDA (Figure 1A).

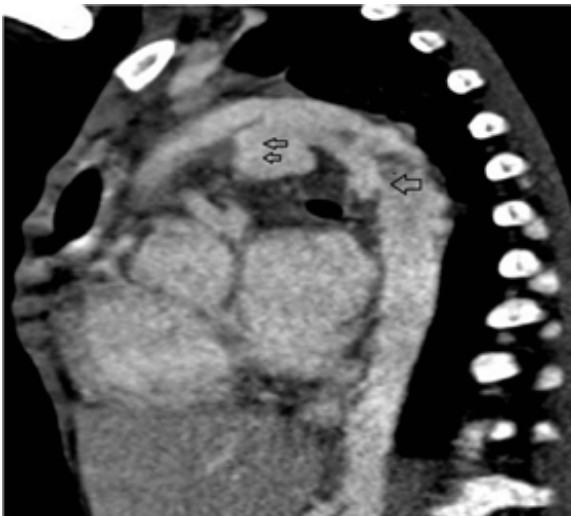


Ill defined soft tissue noted in the pretracheal and subcarinal region showing enhancement in venous phase indicating sign of inflammatory tissue. The ductus arteriosus measures 6.7 mm in maximum diameter and loaded with

thrombus (Figure 1B). A saccular aneurysm was noted arising from the medial aspect of the aortic isthmus measuring 1.4 x 1.7 cm. Irregular thrombus in aortic lumen and wall thickening was noted in the proximal third of the descending aorta (Figure 1B).



Multiple saccular aneurysms noted in the branches pulmonary arteries. A large aneurysm measuring 3.5 x 3.8 cm in size surrounded by peripheral ground-glass opacities evoking pulmonary abscesses was noted from the right lower lobe branch pulmonary artery (Figure 2).



Discussion

The incidence of aneurysm of the patent ductus arteriosus is as high as 8% and infective arteritis is less than 1% per year². Vegetations usually occur on the pulmonary artery end of the ductus, and embolic events are usually to the lungs rather than the systemic circulation. The mycotic aneurysm of branch pulmonary circulation is rare but is a recognised entity. Aneurysms occur within the pulmonary circulation in conjunction with infective endocarditis or in association with pneumonia³.

S. aureus is commonly implicated in relation to septic microemboli associated with infective endocarditis^{3,4}. However, other bacteria, including *Actinomyces* and *Mycobacterium tuberculosis* and fungi, have also been associated in the pathogenesis of mycotic pulmonary artery aneurysms^{3,4}.

Two-dimensional echocardiography shows a great value in the diagnosis of patients with infective endocarditis. But the accuracy of echocardiographic detection of vegetation within the pulmonary artery is limited⁵.

Since the introduction of multi-detector computed tomographic (MDCT) angiography with high spatial and temporal resolution, the assessment of peripheral pulmonary arterial wall has greatly improved. Presently the computed tomographic angiography (CTA) has become the method of choice for imaging the pulmonary vasculature in patients with suspected pulmonary embolism or vegetation⁶. It allows adequate visualization of the pulmonary arteries down to at least the segmental level⁷⁻⁸.

The sensitivity and specificity of MDCT (mainly four-detector) for detection of pulmonary embolism is 83% and 96% respectively⁹. The pulmonary contents of infective endocarditis is seen as vascular abnormalities such as intravascular filling defects, total cutoff of vascular enhancement, or enlargement of an occluded vessel in MDCT¹⁰. Localised mycotic aneurysm of affected pulmonary artery along with perivascular ground-glass opacities are important ancillary findings⁶.

The showering of vegetation to pulmonary vasculature from an infected patent ductus arteriosus is not uncommon. But massive vegetation in both branch pulmonary arterial systems along with multiple mycotic aneurysms of pulmonary arterial system is rarely seen. Moreover, this patient had massive thrombus load in upper descending aorta with suspected dissection in upper third of descending aorta which is quite a rare sequelae of infective endocarditis of patent ductus arteriosus.

Owing to improved spatial resolution over conventional echocardiography, MDCT is the imaging modality of choice for assessment of suspected pulmonary artery pathology. Clinician and radiologists should be aware of the role of MDCT in this setting in order to advise and direct an appropriate imaging strategy.

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11. Figure Legends
12. Fig: 1A CTA image evoking massive vegetation (filling defects) at mid LPA (double arrow) and RPA (single arrow) with distal LPA aneurysm. There are presence of mediastinal inflammatory tissues (star).
13. Fig: 1B CTA image evoking massive vegetation (filling defects) at upper and mid descending aorta with aneurysmal dilatation (single arrow). Patent ductus arteriosus is aneurysmal and loaded with thrombus (double arrow).
14. Fig: 2 CTA image evoking multiple mycotic aneurysms of branch pulmonary artery (single arrow). A large mycotic aneurysms of distal right inferior pulmonary artery (double arrow) surrounded by peripheral ground-glass opacities evoking pulmonary abscesses (Star).