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Mycotic aneurysm of the thoracic aorta presenting as pneumonia

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Abstract Mycotic aneurysms of the thoracic aorta rarely occur in children. We report an unusual case of a mycotic aneurysm of the descending aorta in a 4-year-old boy presenting with respiratory tract infection, which was rapidly complicated by atelectasis of the left lung. The patient’s mycotic aortic aneurysm was diagnosed by contrast-enhanced spiral CT, whereas conventional chest radiographs did not detect its presence. An unsuspected mild aortic coarctation was also diagnosed at the time of admission. This case demonstrates that an aortic aneurysm may clinically and radiologically manifest itself with respiratory tract infection and atelectasis and that contrast-enhanced spiral CT is a fast and powerful tool for establishing the diagnosis.

Introduction Mycotic aneurysms (MA) of the aorta are uncommon and rarely affect children [1, 2]. MA may be caused by infections arising after umbilical catheterisation or by endocarditis in patients affected by congenital cardiovascular malformations. Arterial aneurysms in children may also be associated with degenerative collagen diseases like Marfan’s syndrome or hyper-IgE syndrome [2–5]. Since MA are associated with high mortality, early diagnosis is crucial, and in most cases chest radiographs detect the lesion [3].

Here we report an unusual case of a mycotic aneurysm of the descending thoracic aorta in a child with atypical primary presentation with pneumonia and atelectasis.

Case report A 4-year-old boy was admitted to the paediatric emergency room because of high fever (40°C, 103°F) for the previous 48 h. The child had had intermittent febrile episodes during the evening hours for the previous 1 month. Initially, these episodes were associated with cough, vomiting and diarrhoea, but they seemed to improve with the oral administration of paracetamol. Past medical history revealed that the child had never been affected by episodes of recurrent fever of unknown origin until these recent attacks. A cardiac murmur had been observed for the first time at 8 months
of age, but since the patient was asymptomatic, no further work-up had been performed. The patient had never had an umbilical artery catheter placed.

On admission, the AP and lateral chest radiographs demonstrated a prominent aortic knuckle, increased vascular markings, peribronchial opacities radiating from the hila into the lung and a slightly enlarged left ventricle (Fig. 1). Laboratory data showed elevation of the white blood cell count, mild anaemia, elevated sedimentation rate of 120 mm/h and negative blood culture.

Clinical examination confirmed a systolic murmur and diminution of femoral pulses with a low systolic pressure gradient between the arms and legs. Echocardiography demonstrated mild aortic coarctation and a bicuspid aortic valve, but no signs of myocarditis or valvular vegetations. These findings were considered to be responsible for the radiological features, and the patient was diagnosed as having endocarditis and pneumonia.

After 3 days of antibiotic therapy there was some improvement, but increasing dyspnoea and coughing occurred and a repeat chest radiograph was performed. It demonstrated complete atelectasis of the left lung (Fig. 2). Bronchoscopy was performed, which revealed significant compression of the trachea and left mainstem bronchus by an extraluminal non-pulsatile mass.

Subsequently, spiral CT [5-mm slice thickness, 2:1 pitch; contrast enhancement with Iopamiro 300 (Bracco) at 1 ml/s, dose 1.5 ml/kg body weight, delay 40 s] demonstrated a 5-cm diameter aortic aneurysm localized below the isthmus and small amount of blood leaking into the posterior mediastinum. Additionally, there was atelectasis of the left lung due to compression of the airway (Fig. 3a,b). Two-dimensional multiplanar reconstruction (MPR) images were obtained for better visualization and localisation of the lesion (Fig. 3c, d).

The child was immediately taken to the operating room. A voluminous aneurysm of the descending aorta, mild aortic coarctation and bicuspid aortic valve, septic pleural effusion and complete atelectasis of the left lung were confirmed. Surgical treatment was performed by placing an allograft pericardial tube in place of the descending thoracic aorta. No post-operative complications were recorded and radiographic follow-up with contrast-enhanced thoracic and abdominal CT showed satisfactory morphology of the graft.

**Discussion**

Various infectious agents and congenital cardiovascular malformations have been associated with the development of MA of the aorta [1–3, 6]. Coarctation of the aorta is known to be a risk factor for the development of MA, especially in combination with a bicuspid aortic valve [1, 3, 4]. Aneurysms of the aortic arch or isthmus in patients with coarctation occur with an overall incidence of 10% by the end of the second decade of life, but manifest very rarely in younger children [7, 8].

In this case, coarctation and a bicuspid aortic valve were present as major risk factors, but remained undiagnosed until the occurrence of the MA of the thoracic aorta at the age of 4 years. On review of the child’s past medical history, fever episodes reported by parents in the 1 month prior to admission were consistent with endocardial infections. Therefore, in this case the mycotic aneurysm of the descending aorta occurred presumably as a complication of those infections at the site of the coarctation. In most cases, MA is suspected from the finding of a mediastinal mass on a conventional chest radiograph [3]. Angiography has been regarded as the gold standard for radiological diagnosis and surgical planning, but is an invasive and not widely accessible diagnostic method.

To our knowledge, we report the first case of MA in a child with atypical presentation with atelectasis and pneumonia as the primary manifestations of the underlying disease. In this instance, the final diagnosis could be established by contrast-enhanced spiral CT, which is a fast, widely available and powerful tool; it has been