An unusual paediatric case of mycotic pulmonary artery aneurysm secondary to staphylococcal skin sepsis

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DESCRIPTION

The child was well till 3 months of age when she developed high grade fever documented upto 102° and swelling on the right side of neck. Incision and drainage of the swelling was done and antibiotics were prescribed. After 15 days, similar abscesses were noted in bilateral legs with subsequent swelling on the left side of chest. The pus culture from the skin lesions revealed methicillin-resistant *Staphylococcus aureus* (MRSA) and a diagnosis of disseminated staphylococcal sepsis was made. The blood culture, however, was sterile. The child at 6 months presented with cough and two episodes of massive haemoptysis (about 300 mL per episode). On examination she was toxic and tachycardic. Respiratory system examination revealed decreased air entry on the right side with crepts in right basal segment. The right leg was swollen with areas of pus drainage. At the time of presentation haemoglobin was 100 g/L and SpO₂ was 98% on room air. Her total leucocyte count was 23 000/dL with raised inflammatory markers (C reactive protein: 326 mg/L; procalcitonin 15.5 ng/dL). The child received basic respiratory support with vital monitoring. Chest X-ray demonstrated reduced volume of right lung with confluent areas of consolidation and a well-defined round opacity in the medial aspect of right lower zone (figure 1). Her immune work up including serum immunoglobulin level, T cell surface markers and antineutrophil cytoplasmic antibodies (ANCA) profile was negative. Transthoracic echocardiography (TTE) was normal.

Contrast enhanced scan of the chest done to look for the cause of haemoptysis, revealed multiple well-defined cavitory lesions in bilateral lungs. One of the cavitory lesion in right lower lobe had air-fluid level with an intensely enhancing ovoid lesion measuring 2×2 cm in its medial wall with enhancement similar to vascular enhancement suggestive of aneurysm (figure 2). No thrombus, calcification or any imaging feature to suggest rupture were seen. This lesion was seen communicating with a branch from right lower lobe pulmonary artery. No intracardiac shunt was seen in the present case. Antibiotic therapy in form of vancomycin and linezolid was prescribed to the child. However, the presence of haemoptysis as seen in our case denoted instable lesion and warranted early intervention. Embolotherapy could serve as a bridge therapy, but due to adjacent lung involvement in the present case, middle and lower lobe lobectomy of the right lung was performed. The operation was performed

Figure 1 Chest X-ray demonstrates reduced volume of right lung with confluent areas of consolidation and a well-defined round opacity in the medial aspect of right lower zone (marked with black asterisk).

without complication and the child made an uneventful recovery and was discharged 15 days after surgery. The pathological specimen revealed externally congested pleura. On serial slicing a cystically dilated cavity was identified which was filled with haemorrhage. The lung parenchyma revealed emphysematous changes, patchy chronic inflammation and squamous metaplasia of airways. Adjoining vascular channels were thrombosed, and the thrombi were secondarily infected with acute inflammatory exudate and bacterial colonies.

Figure 2 Axial images of chest (A,B) reveal multiple well-defined cavitory lesions with a ovoid intensely enhancing lesion (marked with black * in B) on the medial aspect of right lower lobe lesion with enhancement similar to vascular enhancement suggestive of aneurysm. Fibrotic bands with adjacent ground glass opacities and pleural thickening are noted in right lung. Volume rendered images from posterior view (C) depicting aneurysm from branch of right lower lobar pulmonary artery. RPA: right pulmonary artery; LPA: left pulmonary artery.

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Images in...

The findings were compatible with pulmonary aneurysm with pneumonitis.

Mycotic aneurysms arising from pulmonary arterial system are rare, with a few cases reported in the literature. Staphylococcal and streptococcus species are the most common causative pathogens as reported in previous case reports.¹ The mode of spread in the present case can be attributed to endovascular seeding from skin abscesses which is also the most frequent route of transmission. The mycotic pulmonary artery aneurysm in children published in the literature is usually secondary to congenital heart disease as ventricular septal defect, endocarditis and immunosuppression.² However, in the present case staphylococcal skin sepsis was implicated as the cause of pulmonary artery aneurysm which has not been previously described. The

prognosis of such aneurysms is dismal with mortality rates of 42%–80% without intervention.² The management of such patients is difficult due to lack of clear guidelines and limited clinical experience. Small aneurysms can be treated conservatively. The presence of haemoptysis as also seen in our case is a significant marker of instability and a strong indicator of prompt intervention. The surgical interventions include aneurysmectomy, lobectomy and pneumonectomy. Less invasive approaches like lobectomy or segmental resection of lung parenchyma if feasible are normally recommended.¹

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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Learning points

- Mycotic aneurysms arising from pulmonary arterial system are rare and the cause being staphylococcal skin sepsis is rarely described in the literature.
- Pulmonary artery aneurysm should be considered in the differential diagnosis of children presenting with massive haemoptysis and further investigations like chest X-ray and CT angiography are warranted to confirm the diagnosis and to plan further management.
- The presence of predisposing factors like congenital heart disease, endocarditis, immunosuppression and features of sepsis also provide clue in making diagnosis of pulmonary artery aneurysms.

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