Abstract

We report a rare case of solitary peripheral pulmonary artery aneurysm in a patient who was evaluated for haemoptysis. Incidentally, his total antibodies were positive for Coronavirus 2019 infection. Patient underwent right lower lobectomy uneventfully. Peripheral pulmonary artery aneurysms arising from segmental or intrapulmonary branches are extremely rare. Untreated, the majority end fatally due to sudden rupture and exsanguination. The purpose of this article is to report our rare case and review the pertinent literature.

Keywords: Peripheral pulmonary artery aneurysm • Coronavirus 2019

CASE REPORT

A 40-year-old man presented with an episode of haemoptysis. He had a history of intermittent mild grade fever, cough and dyspnoea lasting for a month. He had no history of haemoptysis in the past. He had no pre-existing medical conditions or Coronavirus 2019 (COVID-19) infection. His clinical examination was unremarkable.

Blood investigations were within normal limits. Reverse transcription polymerase chain reaction test was negative for COVID-19 infection, but his total antibodies test was elevated -117 (biological reference range <1.0). 2D Echocardiography was normal. Chest radiography showed a solitary pulmonary lesion in the right lower lung zone (Fig. 1A).

A computed tomography of the chest plain and contrast confirmed the presence of a 3.7 cm × 3.6 cm, well-defined, circumscibed and densely enhancing lesion in apicoposterior segment of right lower lobe. It is seen along the course of descending branch of the right pulmonary artery. Areas of consolidation are also seen in apicoposterior segment. Post-contrast study shows heterogenous enhancement of this lesion suggestive of an aneurysm. The rest of lung parenchyma was normal (Fig. 1B and C).

The diagnosis of a solitary peripheral pulmonary artery aneurysm (PAA) was considered and right lower lobectomy was performed through posterolateral thoracotomy. The examination revealed a 2-cm reddish nodule in the apicoposterior segment of the lower lobe, which was soft with a palpable thrill (Fig. 2A).

Figure 1: (A) Chest radiograph showing solitary pulmonary lesion in right lower lung zone (white arrow). (B) Axial slice from computed tomography scan demonstrating a 3.7 cm × 3.6 cm aneurysm with distal lung consolidation. (C) Computed tomography scan with contrast showing enhancement of lesion.
On the occlusion of right lower lobe pulmonary artery, the size of the nodule was reduced.

On microscopy, lung parenchyma showed alveolar spaces filled with mixed inflammatory cells and macrophages. Sections from the dilated cavity showed the wall having a distinct muscular layer and elastic tissue support resembling a blood vessel with a layer of clot inside (Fig. 2B). The clot is composed of mixed inflammatory cells and blood along with few fungal elements having broad septate hyphae, most likely zygomycetes (Fig. 2C). There is no evidence of granuloma or atypia or acid-fast bacilli. Final impression was true peripheral pulmonary artery aneurysm with luminal thrombus with fungal infestation associated with pneumonic consolidation.

The patient had an uneventful recovery and was discharged from the hospital on the fourth postoperative day.

DISCUSSION

The estimated incidence of PAA is 1 in 14 000 autopsies, and these lesions can be central aneurysms involving the pulmonary trunk, right or left main pulmonary artery (70%) and peripheral aneurysms that arise from segmental or intrapulmonary branches (30%). An aneurysm can be true or pseudo aneurysm. Most cases are diagnosed at the autopsy, but more cases are being diagnosed incidentally by imaging modalities [1].

Most of these aneurysms are associated with congenital heart disease, Behcet's disease, infection, trauma and vasculitis. Idiopathic PAA is rare, with poorly understood pathogenesis. Most patients present with unremarkable symptoms such as dyspnoea, cough, chest pain, hoarseness and haemoptysis and are referred due to vascular dilatation on imaging [2].

In our patient, haemoptysis is likely from the pulmonary artery, which is very rare. There was a history of fever, cough and dyspnoea for a month for which no treatment was taken. Incidentally, his total antibodies were positive for COVID-19 infection. Pulmonary embolic disease in COVID-19 infection is reported in up to 33% of cases. In our case, it can be sequelae of COVID-19 infection, or an incidental finding is difficult to interpret [3].

Majority of fungal infection associated with PAA are seen in patients with endocarditis or intravenous drug abuse or contiguous spread from within consolidated lung (sometimes called a Rasmussen aneurysm). In our case, infection involved only thrombus.

In this patient, an aneurysm is a true aneurysm and origin may be idiopathic or post-inflammatory with superadded fungal infection in thrombus, post-COVID-19 infection. Long-term follow-up is required to observe the future course.

In conclusion, true solitary peripheral PAA is an extremely rare entity. A high degree of suspicion is needed for diagnosing PAA on imaging. Intervention is mandatory as soon as the diagnosis is made, to prevent rupture and death. PAA has been managed...
most often by lobectomy but occasionally by pulmonary artery repair or endovascular approach.

**Conflict of interest:** none declared.

**Reviewer information**

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