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Pulmonary Artery Aneurysm: Case Report

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Abstract **Case Report**

Pulmonary artery aneurysm is a rare entity. It results from various etiologies, congenital or acquired. We present the case of a 62-year-old man with a history of congenital heart disease who presented with dyspnea for 3 years. Angioscan showed an aneurysmal dilatation of the pulmonary artery trunk and its right branch associated with an atrial septal defect with restenosis of the pulmonary valve. The restenosis of the pulmonary valve and the atrial septal defect were therefore considered to be the etiological factors responsible for the aneurysm in our patient.

Keywords: Pulmonary artery, aneurysm, case report.

INTRODUCTION

A pulmonary artery aneurysm (PAA) is a rare disorder of the pulmonary vascular system. They can arise from a number of etiologies, including congenital, idiopathic, autoimmune, infectious, inflammatory and malignant [1]. Patients often present with non-specific symptoms ranging from incidental findings on imaging to massive haemoptysis [2]. The most common symptoms are dyspnea, chest pain and cough [3]. Diagnosis and treatment are essential because of the risk of enlargement and subsequent rupture. Aneurysm rupture is associated with a mortality rate of almost 50% [4]. The mean diameter of the pulmonary artery is 32 mm ± 4.6 mm and pulmonary artery dilation is generally considered to be greater than 45 mm [5].

We present the case of a 62-year-old man who had been presenting with dyspnea and palpitation for 3 years and a pulmonary artery aneurysm was detected on imaging by thoracic angioscan.

Objective

The aim of this study is to report the case of one patient and to support the role of imaging in the diagnosis of this entity.

PATIENT AND METHODICAL

Patient information: We report the case of a 62 year old male patient with a history of congenital heart disease such as atrial septal defect and pulmonary valve stenosis, operated on twice at the age of 5 for blacklok-Taussin anastomosis and then for closure of the anastomosis with commissurotomy of the pulmonary valve, was admitted for progressive dyspnea classified as NYHA type III with palpitation on exertion, which had been evolving for 3 years.

Clinical results: The physical examination revealed a systolic murmur at the 3/6th lung site with a saturation of 91% on room air. The rest of the examination was unremarkable.

Diagnostic approach: the chest X-ray showed enlargement of the left middle arch, (Figure 1). Cardiac ultrasound showed pulmonary and supra-valvular stenosis responsible for post-stenotic dilatation of the pulmonary artery associated with an atrial septal defect with a bidirectional left-to-right shunt. The thoracic angioscan performed on our patient showed stenosis of the pulmonary valve associated with post-stenotic aneurysmal dilatation of the trunk of the pulmonary artery and its right branch (Figure 2).

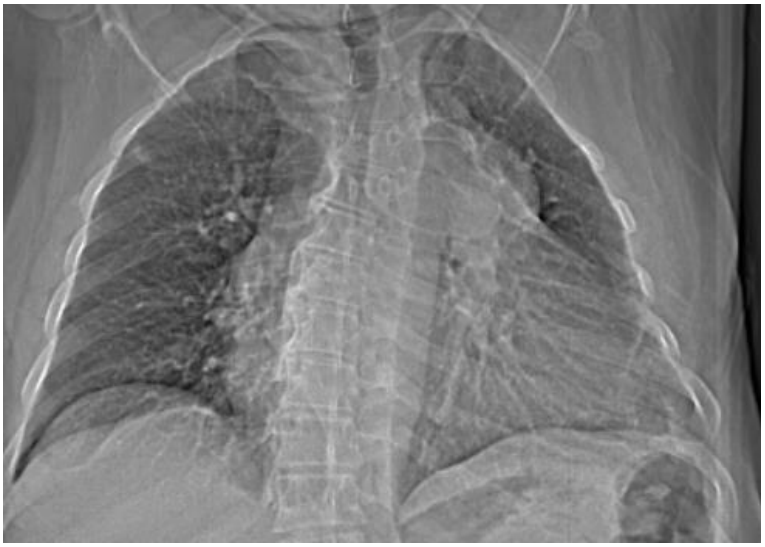

Figure 1: Topogram showing enlargement of the left middle arch with cardiomegaly

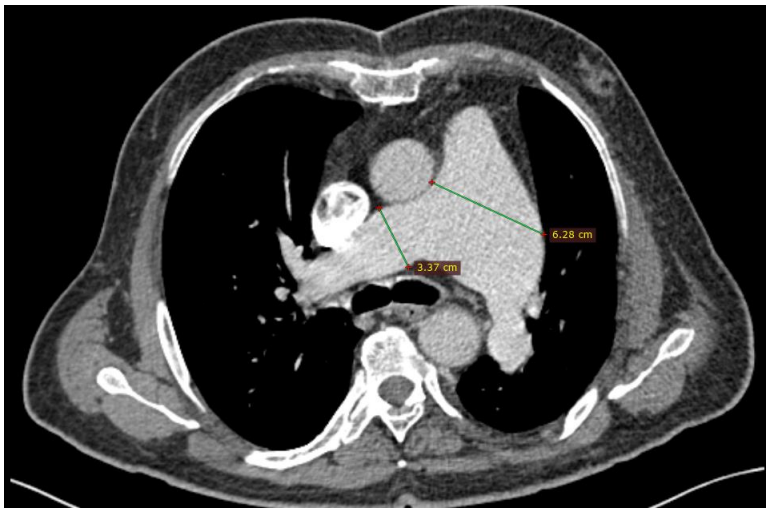

Figure 2: Computed tomography scan showing dilatation of the trunk of the pulmonary artery and its right branch. The ratio of the diameter of the pulmonary artery to that of the aorta is greater than two

Informed consent: the patient has given her consent.

DISCUSSION

Main pulmonary artery aneurysms are rare. Deterling et al. reported that aneurysms were found in approximately 1 in 14,000 autopsies [6]. However, more and more aneurysms are being discovered incidentally on imaging [7].

A pulmonary artery aneurysm is defined as an abnormal dilatation of the pulmonary artery that can reach a diameter of more than 45 mm, with a normal limit estimated at 32 mm ± 4.6 mm [5].

The symptoms of pulmonary artery aneurysm are non-specific and depend on the underlying etiology. The most common symptom is dyspnea, chest pain, cough, haemoptysis, breathlessness, chest pain, palpitations or syncopal episodes. Other additional symptoms are attributed to extrinsic bronchial compression by a large aneurysm. In the majority of cases, patients are generally asymptomatic [1].

Aneurysms are classified as acquired, congenital and idiopathic [8]. A comprehensive review by Gupta *et al*., found congenital causes accounted for 25% of reported cases. Congenital heart defects cause increased blood flow due to left-to-right shunting and promote aneurysm formation by increasing shear stress on vessel walls. Ventricular septal defects, patent ductus arteriosus and atrial septal defects are considered to be the congenital heart defects most associated with aneurysms [9]. In our patient, congenital re-stenosis of the pulmonary valve with atrial septal defect was considered the likely dominant etiological factor.

Pulmonary valve stenosis has been shown to cause dilatation due to turbulent blood flow at the distal end of the pulmonary stenosis. This mechanism of post-stenotic dilatation is unclear. However, it is assumed that as a result of the stenosis, there is a drop in pressure

and an increase in blood velocity across the obstructive lesion. This has an effect on the downstream vessel, which dilates [10].

Imaging plays an important role in the diagnosis and monitoring of this condition.

Chest radiography is a simple, non-invasive diagnostic modality that should be used first whenever pathology of the pulmonary system is suspected [11]. Attention should be paid to any enlargement of the mediastinum which may be suggestive, such as enlargement of the left middle arch, which may erroneously simulate an aortic aneurysm.

Transthoracic echocardiography coupled with transoesophageal echocardiography makes the positive and aetiological diagnosis by highlighting aneurysmal dilatation of the pulmonary artery and other underlying anomalies [12]. In our case, they showed valvular and supra-valvular stenosis of the pulmonary valve with moderate regurgitation associated with atrial septal defect and aneurysmal dilatation of the pulmonary artery trunk.

The gold standard for diagnosis is thoracic angioscan, which can confirm the presence, size, location and characteristics, including the type of saccular or fusiform aneurysm. Just as importantly, it can provide information about the underlying etiology [13]. In our patient the results of the CT scan demonstrated stenosis of the pulmonary valve measuring with post stenotic aneurysmal dilatation of the pulmonary artery trunk measuring 6.2 cm and its right branch measuring 3.2 cm associated with an atrial septal defect.

Magnetic resonance imaging, although not as commonly used as angioscan to assess the pulmonary arteries, is a viable alternative when angioscan cannot be used (allergy to iodinated contrast agent, renal failure). The use of MRI to assess the pulmonary arterial system has been documented and described T1-weighted images have been shown to highlight pseudoaneurysms. Fast spin echo and gradient echo imaging are useful for morphological assessment of the pulmonary vasculature from the main pulmonary trunk down to the subsegmental level [14].

Routine radiographic follow-up should also be carried out to monitor the progression of the aneurysm. It is important to monitor the patient at regular intervals and to maintain follow-up with angioscan [1].

CONCLUSION

Pulmonary artery aneurysms are rare. There are many etiologies, dominated by congenital heart disease. In our case, aneurysmal dilatation of the pulmonary artery and its branches is secondary to re-stenosis of the pulmonary valve and atrial septal defect. Imaging plays an important role in confirming the diagnosis and in follow-up.

Conflicts of Interest: The authors declare no conflicts of interest.

Authors' Contributions: All the authors contributed to the diagnostic and therapeutic management of the patients and to the drafting of this work. They also declare that they have read and approved the final version of the manuscript.

REFERENCES

1. Gupta, M., Agrawal, A., Iakovou, A., Cohen, S., Shah, R., & Talwar, A. (2020). Pulmonary artery aneurysm: a review. *Pulmonary circulation*, *10*(1), 2045894020908780.
2. Nguyen, E. T., Silva, C. I. S., Seely, J. M., Chong, S., Lee, K. S., & Müller, N. L. (2007). Pulmonary artery aneurysms and pseudoaneurysms in adults: findings at CT and radiography. *American Journal of Roentgenology*, *188*(2), W126-W134.
3. Kalra-Lall, A., Donaldson, J., & Martin, C. (2019). 3rd brief review: pulmonary artery aneurysms and false aneurysms. *Int J Cardiovasc Imag*, 35(7), 1357-1364.
4. Chen, Y., Gilman, M. D., Humphrey, K. L., Salazar, G. M., Sharma, A., Muniappan, A., ... & Wu, C. C. (2017). Pulmonary artery pseudoaneurysms: clinical features and CT findings. *American Journal of Roentgenology*, *208*(1), 84-91.
5. Berger, T., Siepe, M., Simon, B., Beyersdorf, F., Chen, Z., Kondov, S., ... & Kreibich, M. (2022). Pulmonary artery diameter: means and normal limits—assessment by computed tomography angiography. *Interactive CardioVascular and Thoracic Surgery*, *34*(4), 637-644.
6. Deb, S. J., Zehr, K. J., & Shields, R. C. (2005). Idiopathic pulmonary artery aneurysm. *The Annals of thoracic surgery*, *80*(4), 1500-1502.
7. Trell, E. (1973). Pulmonary arterial aneurysm. *Thorax*, *28*(5), 644-649.
8. Kreibich, M., Siepe, M., Kroll, J., Höhn, R., Grohmann, J., & Beyersdorf, F. (2015). Aneurysms of the pulmonary artery. *Circulation*, *131*(3), 310-316.
9. Seguchi, M., Wada, H., Sakakura, K., Kubo, N., Ikeda, N., Sugawara, Y., ... & Momomura, S. I. (2011). Idiopathic pulmonary artery aneurysm. *Circulation*, *124*(14), e369-e370.
10. Rodbard, S., Ikeda, K., Montes, M., & Rodbard, S. (1967). An analysis of mechanisms of post stenotic dilatation. *Angiology*, *18*(6), 349-369.
11. Shafiq, A., Bokhari, A., Nahin, I., & Rabbani, B. (2014). Extreme dilation of pulmonary artery: a literature review. *Case Reports*, *2014*, bcr2013202223.
12. Corbi, P., Jayle, C., Christiaens, L., Tailboux, L., Rahmati, M., & Allal, J. (1999, January). Idiopathic aneurysm of the pulmonary artery trunk. Report of a case. In *Annales de Medecine Interne*, *150*(1), 67-69.
13. Park, H. S., Chamarthy, M. R., Lamus, D., Saboo, S. S., Sutphin, P. D., & Kalva, S. P. (2018). Pulmonary artery aneurysms: diagnosis & endovascular therapy. *Cardiovascular diagnosis and therapy*, *8*(3), 350-361.
14. Ugolini, P., Mousseaux, E., Sadou, Y., Sidi, D., Mercier, L. A., Paquet, E., & Gaux, J. C. (1999). Idiopathic dilatation of the pulmonary artery: report of four cases. *Magnetic resonance imaging*, *17*(6), 933-937.