Cirugía Cardiovascular 29 (2022) 231–232

Case Report

An unusual case of chest pain: Giant pulmonary artery aneurysm secondary to patent ductus arteriosus

Elizabeth Aguilar-Alaniz[a,*], Julieta González-Palacios[b], Rodrigo Reyes-Pavón[c], Luis Miguel-Carrillo[d]

[a] Department of Cardiothoracic Surgery, Centenario Hospital Miguel Hidalgo, Aguascalientes, Mexico
[b] Department of Pediatric Cardiology, Centenario Hospital Miguel Hidalgo, Aguascalientes, Mexico
[c] Department of Medicine, Health Sciences Center, Universidad Autónoma de Aguascalientes, Mexico
[d] Department of General Surgery, Centenario Hospital Miguel Hidalgo, Aguascalientes, Mexico

ARTICLE INFO

Article history:
Received 22 February 2022
Accepted 18 April 2022
Available online 15 June 2022

Keywords:
Aneurysm
Adult congenital heart disease
Pulmonary arteries
Patent ductus arteriosus
Pulmonary hypertension

ABSTRACT

Aneurysms arising from the pulmonary artery are a rare condition and bear a high risk of death from rupture, dissection or RV failure. We report a case of a pulmonary artery aneurysm secondary to a patent ductus arteriosus, successfully treated with aneurysmectomy and patch repair.

© 2022 Published by Elsevier España, S.L.U. on behalf of Sociedad Española de Cirugía Cardiovascular y Endovascular. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Una causa inusual de dolor torácico: Aneurisma gigante de la arteria pulmonar secundaria a conducto arterioso persistente

Palabras clave:
Aneurisma
Cardiopatías congénitas del adulto
Arterias pulmonares
Conducto arterioso persistente
Hipertensión pulmonar

RESUMEN

Los aneurismas originados de la arteria pulmonar son una condición rara, con elevada mortalidad asociada a su ruptura, disección, o disfunción ventricular derecha. Se reporta el caso de un aneurisma gigante de la arteria pulmonar en un adulto, secundario a un conducto arterioso persistente, el cual fue tratado satisfactoriamente de forma quirúrgica mediante resección y reparación con parche.

© 2022 Publicado por Elsevier España, S.L.U. en nombre de Sociedad Española de Cirugía Cardiovascular y Endovascular. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Clinical summary

A 26-year-old man presented at our clinic with a three months history of intermittent chest pain with moderate exertion, associated with palpitations. His past medical history included a PDA diagnosed when he was 10 years old, with a previous episode of infectious endarteritis diagnosed and treated with antibiotics for 6 weeks at another institution, after which he lost follow-up. At admission, on physical examination he had a left parasternal thrust on the 2nd intercostal space, and a grade 4/6 continuous murmur in the left infraclavicular area. No signs of a rheumatologic disease were present. His vital signs were normal and a blood pressure of 130/80.

Electrocardiogram was unremarkable. Chest X-ray showed mild cardiomegaly, increased pulmonary blood flow, and considerable mediastinal enlargement. A transthoracic echocardiography showed normal size and function of both ventricles with left ventricle ejection fraction of 70%, normal valves and no pulmonary hypertension (systolic pressure of 40 mmHg estimated by tricuspid regurgitation). There was a 15-mm patent ductus arteriosus with a pulmonary end of 3.6 mm diameter with continuous left-to-right shunt and a systolic gradient of 50 mmHg. A chest computed tomography scan (Figs. 1 and 2) revealed an arterial duct with a small pulmonary end of 3 mm and a calcified aneurysmal dilatation of the anterior wall of the pulmonary arterial trunk with a maximal diameter of 64 mm, the pulmonary arteries were normal and showed no signs of obstruction.

The patient was taken to the operating room. Through a median sternotomy, cardiopulmonary bypass was initiated through bicaval cannulation on mild hypothermia.

The aneurysm measured 7 × 6 cm and was located 12 mm distal to the pulmonary annulus (Fig. 3). The aneurysm wall, highly calcified, and with no vegetations, was resected and the pulmonary

Abbreviations: PDA, patent ductus arteriosus; NYHA, New York Heart Association; CHD, congenital heart defects.

Abreviaturas: PCA, persistencia del conducto arterioso; NYHA, New York Heart Association; DCC, defectos cardíacos congénitos.

* Corresponding author.
E-mail address: eaguilar12598@gmail.com (E. Aguilar-Alaniz).

https://doi.org/10.1016/j.circv.2022.04.003
1134-0096/© 2022 Published by Elsevier España, S.L.U. on behalf of Sociedad Española de Cirugía Cardiovascular y Endovascular. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

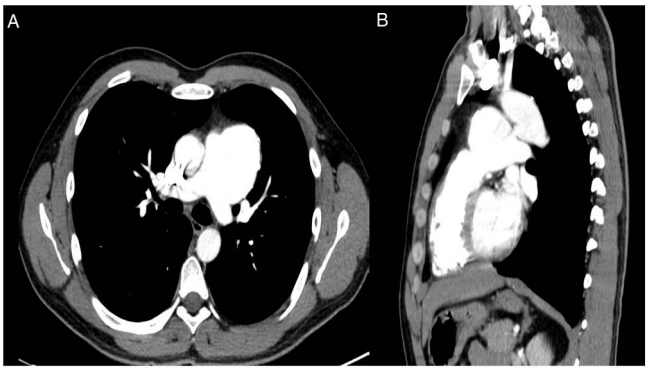

Fig. 1. Contrast enhanced multislice chest CT (A) axial and (B) sagittal slices, showing an aneurysmal dilation arising from the pulmonary artery and wide patent ductus arteriosus.

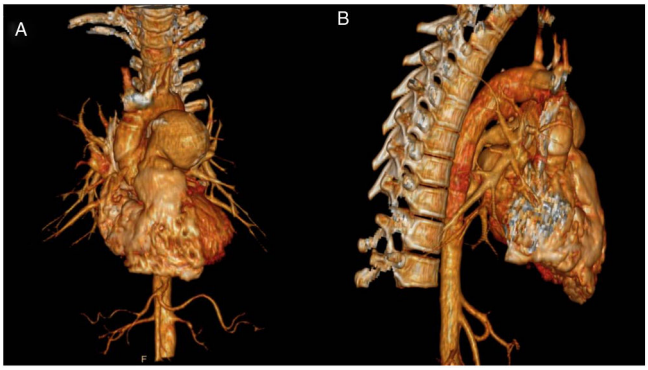

Fig. 2. Three-dimensional reconstruction from the chest showing: dilated pulmonary trunk.

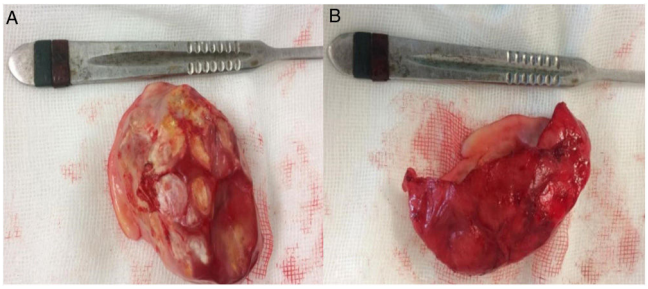

Fig. 3. Specimen resected shown in the anterior (A) and posterior (B) view, measuring 7 × 6 cm.

artery trunk was reconstructed using a bovine pericardial patch. Then, the ductus was ligated on both ends. The cardiopulmonary bypass was stopped, with a total bypass time of 113 min and an aortic cross-clamp time of 60 min. Patient was extubated within 24 h. He had an uneventful postoperative period. The specimen was subjected to histological examination, and showed a true aneurysm of the pulmonary artery.

He was discharged home on postoperative day 6. Three years after the surgery, he is on NYHA functional class I, with complete resolution of his symptoms and a normal physical exam.

Discussion

CHD have been recognized as the main cause of pulmonary artery aneurysms. In decreasing order, they include PDA, ventricular septal defects, atrial septal defects and less frequently, conotruncal defects have also been associated.[1,2] Infectious complications, such as endarteritis, have also been implied as risk factors.[2]

This implies the importance of the prompt diagnosis of all congenital heart defects as well as the percutaneous or surgical closure.

The aneurysm presented in the case measured 64 mm in diameter. Pulmonary artery dilatation has been defined beyond a 29 mm width (and up to 31 mm in females), and when the dilation exceeds 40 mm, an aneurysm should be considered.[3]

Not enough cases have been reported to develop evidence-based guidelines on the appropriate management of such cases, but interest has been raised in order to prevent lethal complications such as dissection and rupture. Some of the risk factors that have been identified and that may increase the rate of the complications mentioned include the width and the growth rate of the aneurysm, and the presence of pulmonary hypertension, usually associated to a CHD. Absolute values differ according to different case series, but surgery should be considered with a width >5.5 cm, a growth rate >2 mm/year or a pulmonary pressure >50 mmHg.[1,4,5]

Treatment options include pulmonary artery replacement with a graft or aneurysmectomy and repair with pericardial patch (either autologous or heterologous), such as the case we described. Interventional techniques, such as occlusion of the aneurysm's neck or excluding the aneurysm with an occluded stent, have been described, yet, long-term follow-up to confirm safety and outcomes is pending. We consider that at the time of the present case, surgery should be considered the first treatment option until such concerns are properly addressed.[4,5]

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Authors' statement

Permission was granted by the patient to publish the case report.

Informed consent

Informed consent was obtained by the patient and family to underwent surgery and to publish the results and the article.

Conflict of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

1. Kreibich M, Siepe M, Kroll J, Hohn R, Grohmann J, Beyesdorf F. Aneurysms of the pulmonary artery. Circulation. 2015;131:310–6.
2. Zhang L, Li Y, Lv Q, Yuan L. Pulmonary artery aneurysm secondary to patent arterial duct and infection: a case report and review. Echocardiography. 2018;35:1–4.
3. Gupta M, Agrawal A, Iakovou A, Cohen S, Shah R, Talwar A. Pulmonary artery aneurysm: a review. Pulm Circ. 2020;10:1–10.
4. Ahmed T, Ramani GV, Ghoreishi M, Safdar A, Griffith BP. Management of pulmonary artery aneurysms in pulmonary hypertension: a single-center review of 3 cases. Case Rep Cardiol. 2019, http://dx.doi.org/10.1155/2019/1924014.
5. Theodoropoulos P, Ziganshin BA, Tranquilli M, Elefteriades JA. Pulmonary artery aneurysms: four case reports and literature review. Int J Angiol. 2013;22:143–8.


BIOMED
unidix
Especialistas en cirugía cardiovascular
desde 1977 al cuidado de tu salud
91 803 28 02
info@biomed.es