



CASE REPORT

Intracardiac thrombus and Murphy's law: Reflections on a clinical dilemma



Patrícia Rodrigues*, Maria João Sousa, Luísa Caiado, Sofia Cabral, Ana Meireles,
Mário Santos, Paulo Palma, Severo Torres

Cardiology Department, Centro Hospitalar do Porto, Porto, Portugal

Received 10 April 2015; accepted 13 September 2015

Available online 16 March 2016

KEYWORDS

Left ventricular
thrombus;
Embolization;
Anticoagulation;
Thrombectomy

Abstract We discuss the case of a 49-year-old patient with left ventricular systolic dysfunction and a large, mobile and protruding apical thrombus. In spite of anticoagulation treatment, extensive and clearly defined systemic embolization occurred.

We discuss the current evidence on the treatment of intracardiac thrombus with high risk of systemic embolization and propose a tailored approach to avoid potential catastrophic consequences.

© 2016 Sociedade Portuguesa de Cardiologia. Published by Elsevier España, S.L.U. All rights reserved.

PALAVRAS-CHAVE

Trombo do ventrículo
esquerdo;
Embolização;
Anticoagulação;
Trombectomia

Trombos intracardíacos e a lei de Murphy: reflexão sobre um dilema clínico

Resumo Apresentamos o caso de um doente de 49 anos com disfunção sistólica ventricular esquerda e um trombo apical de grandes dimensões, móvel e com protrusão para a cavidade ventricular. Apesar do tratamento anticoagulante, ocorreram vários fenómenos de embolização sistémica, extensos e muito ilustrativos.

Discutimos a evidência atual sobre o tratamento de trombos intracardíacos com alto risco de embolização sistémica e propomos uma reflexão sobre uma abordagem personalizada para evitar potenciais consequências catastróficas.

© 2016 Sociedade Portuguesa de Cardiologia. Publicado por Elsevier España, S.L.U. Todos os direitos reservados.

Case report

We present the case of a 49-year-old male, a smoker, with type 2 diabetes mellitus, hypertension, dyslipidemia, stage

* Corresponding author.

E-mail address: pfdrodrigues@gmail.com (P. Rodrigues).

3 renal failure and atrial fibrillation (AF). He had been recently diagnosed with probable tachycardiomyopathy, because of fluctuating degrees of left ventricular systolic dysfunction in the context of poorly controlled AF, in the absence of coronary artery disease.

He was admitted with rapid AF and decompensated heart failure. In terms of AF treatment, he was taking bisoprolol, digoxin and warfarin, but his international normalized ratio was subtherapeutic.

He was started on parenteral anticoagulation, but shortly after admission he developed left hemiparesis, pain in the lower limbs and abdominal pain.

The echocardiogram showed moderate left ventricular (LV) systolic impairment and a massive mobile thrombus in the LV apex (Figure 1A and B) and another in the left atrium (Figure 1C).

Computed tomography confirmed multiple cerebral (Figure 1D), splenic (Figure 1E) and renal (Figure 1F) infarcts, as well as an almost total occlusion of the infrarenal abdominal aorta (Figure 1G), distal to the origin of the inferior mesenteric artery.

He was referred for emergent thrombectomy for removal of the aortic thrombus and continued anticoagulation, with favorable recovery.

This is a catastrophic case of intracardiac thrombus with massive systemic emboli. It is a reminder of the dangerous association between atrial fibrillation and left ventricular systolic impairment, highlighting the importance of adequate anticoagulation in these patients.

It also prompts reflection on the lack of treatment options available for patients when a large mobile protruding thrombus is already present and there is a substantial risk for systemic embolic phenomena, even with anticoagulation treatment. Surgical thrombectomy^{1,2} may be considered, especially if there are recurrent emboli despite anticoagulation and if the thrombus remains large, but it also carries a very high risk.

Some weeks later, another patient was admitted to our center with a history of ischemic heart disease and decompensated heart failure. She had a very large, apparently pedunculated and protruding LV thrombus. Medical and surgical treatment options were discussed, but her surgical risk was felt to be very high and she was started on anticoagulation, maintaining clinical stability. After a week, when she was about to be discharged, a transthoracic echocardiogram was repeated, which no longer showed any intracardiac thrombus. A few hours later, she suddenly died of a massive stroke.

In conclusion, handling patients with a large intracardiac thrombus, particularly when located in the left cardiac chambers and clearly fresh, mobile and pedunculated, is often problematic. In these circumstances, to start anticoagulation and hope for the best feels quite insufficient.

In the few observational studies available to date, 10–15% of patients with an LV thrombus (most of them after myocardial infarction) suffered a significant embolic event, especially in the first 3–4 months,³ and anticoagulation was associated with a significant reduction in the occurrence

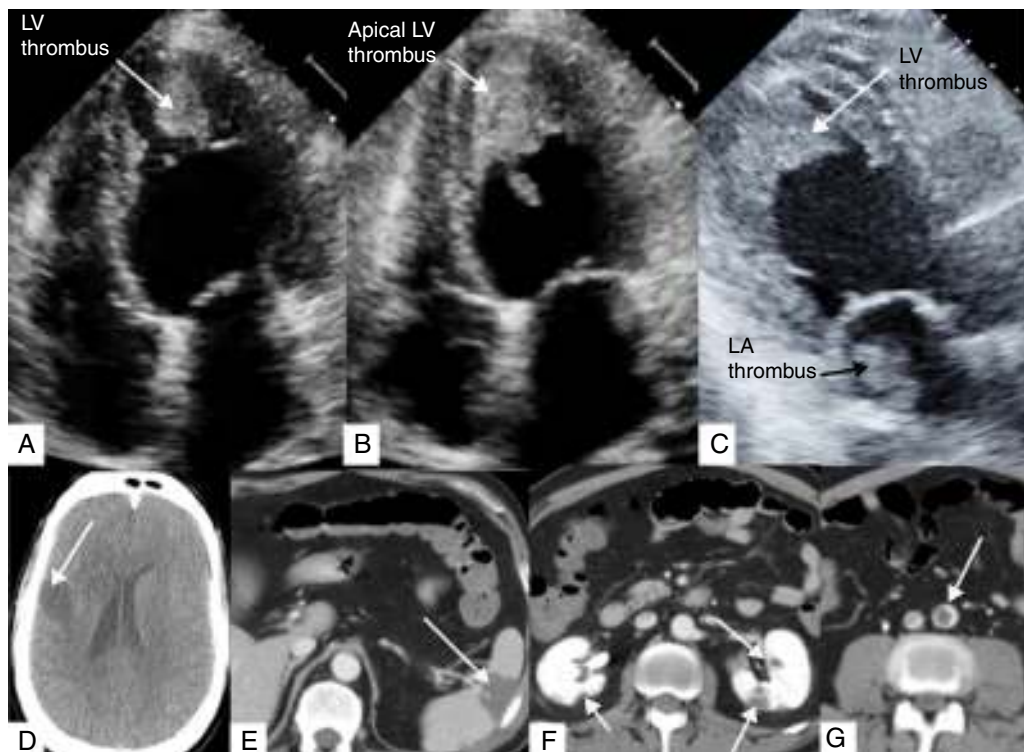


Figure 1 (A) Transthoracic echocardiogram, apical 4-chamber view in diastole, showing apical LV thrombus; (B) transthoracic echocardiogram, apical 4-chamber view in systole, showing the thrombus protruding into the LV cavity; (C) transthoracic echocardiogram, apical 3-chamber view, showing the LV and LA thrombi; (D) cerebral computed tomography, displaying a large cerebral infarct; (E–G) abdominal computed tomography with contrast, showing splenic (E) and renal (F) infarcts and almost total occlusion of the infrarenal abdominal aorta (G). LA: left atrial; LV: left ventricular.

of embolization.^{4,5} However, not all thrombi are the same. In particular, thrombus mobility and protrusion have been associated with a higher embolization risk, of approximately 60%.^{3,6}

Since large, protruding, fresh thrombi are relatively rare, there are no studies that specifically address this problem. The few published case reports and observational studies of thrombus with these characteristics that were treated with a surgical approach showed successful results^{2,7,8} and perhaps this option should be considered more often.

Other options could also be explored, such as the development of a percutaneous device to temporarily contain the thrombus in the apex and facilitate aspiration, or some other option that increases the odds for a positive outcome.

We hope that further research will be performed in this area and that it will be possible to offer a better treatment strategy for high-risk intracardiac thrombus.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

Conflicts of interest

The authors have no conflicts of interest to declare.

References

1. Leor J, Agranat O, Mohr R, et al. Urgent surgical removal of a rapidly growing left ventricular thrombus following acute myocardial infarction. *Am Heart J.* 1990;119:1199–201.
2. Nili M, Deviri E, Jortner R, et al. Surgical removal of a mobile, pedunculated left ventricular thrombus: report of 4 cases. *Ann Thorac Surg.* 1988;46:396–400.
3. Stratton JR, Resnick AD. Increased embolic risk in patients with left ventricular thrombi. *Circulation.* 1987;75:1004–11.
4. Keating EC, Gross SA, Schlamowitz RA, et al. Mural thrombi in myocardial infarctions. Prospective evaluation by two-dimensional echocardiography. *Am J Med.* 1983;74:989–95.
5. Vaitkus PT, Barnathan ES. Embolic potential, prevention and management of mural thrombus complicating anterior myocardial infarction: a meta-analysis. *J Am Coll Cardiol.* 1993;22:1004–9.
6. Haugland JM, Asinger RW, Mikell FL, et al. Embolic potential of left ventricular thrombi detected by two-dimensional echocardiography. *Circulation.* 1984;70:588–98.
7. Cousin E, Scholfield M, Faber C, et al. Treatment options for patients with mobile left ventricular thrombus and ventricular dysfunction: a case series. *Heart Lung Vessel.* 2014;6:88–91.
8. Lee JM, Park JJ, Jung HW, et al. Left ventricular thrombus and subsequent thromboembolism, comparison of anticoagulation, surgical removal, and antiplatelet agents. *J Atheroscler Thromb.* 2013;20:73–93.