

CASE REPORT

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Fatal cerebral thrombosis after pericardiectomy

Qin Jiang^{1*}, Tao Yu¹, Keli Huang¹, Bing Huang², Xiang Huang³ and Shengshou Hu⁴

Abstract

Background Pericardiectomy due to constrictive pericarditis is usually safe procedure. There was a rare event of thrombosis after pericardiectomy, which was mainly accounted by low-cardiac-output syndrome.

Case presentation Here, we report the case undergoing pericardiectomy after constrictive pericarditis, with fatal cerebral thrombosis after pericardiectomy confirmed by endovascular mechanical thrombectomy. Even though recanalization was completed and suggestive decompressive craniectomy was in preparation, the patient still died for cerebral hernia due to severe edema. The causes of cerebral thrombosis after pericardiectomy in this case was accounted by the persistence of nonpliable pericardium encasing the left ventricular wall limited local myocardium motor, pro-coagulable state due to thermal transmission during decortication like radiofrequency ablation under the condition of postoperative atrial fibrillation and rapid ventricular rates precipitated the information of mural thrombus in cardiac cavity and migration into the main branch of the aortic arch.

Conclusion The protocol of prompt aggressive anticoagulation prophylaxis would be vigilantly recommended for the patients undergoing pericardiectomy.

Keywords Pericardium, Arrhythmias, Thrombosis

A 52-year-old female patient with sinus rhythm and normal imaging result of coronary artery radiography (Fig. 1, Top-left) underwent an elective pericardiectomy due to constrictive pericarditis. She was smoothly weaned from ventilator in the evening of operation day and was transferred back to cardiac surgery ward from ICU one day after procedure. The patient suffered from

sudden unconsciousness in the morning on the next two day after procedure. Brain computed tomography (CT) examination showed acute ischemic stroke with massive low-density image at the right cerebrum. Cerebral CT angiography indicated the embolism in the right middle cerebral artery (Fig. 1, Top-right). Subsequently, complete recanalization of the thrombosed vessel was successfully attempted by endovascular mechanical thrombectomy (Fig. 1, Middle-left). The unconsciousness was progressive and the CT's confirming sign was characteristic of high-density image scattered within the infarction zone and severe cerebral edema (Fig. 1, Middle-right). Decompressive craniectomy for reducing intracranial pressure was suggested by neurosurgeon to prevent from cerebral hernia but the patient's relative gave up for palliative treatment. The patient died after discharge of hospital without autopsy in the early morning at the three days after

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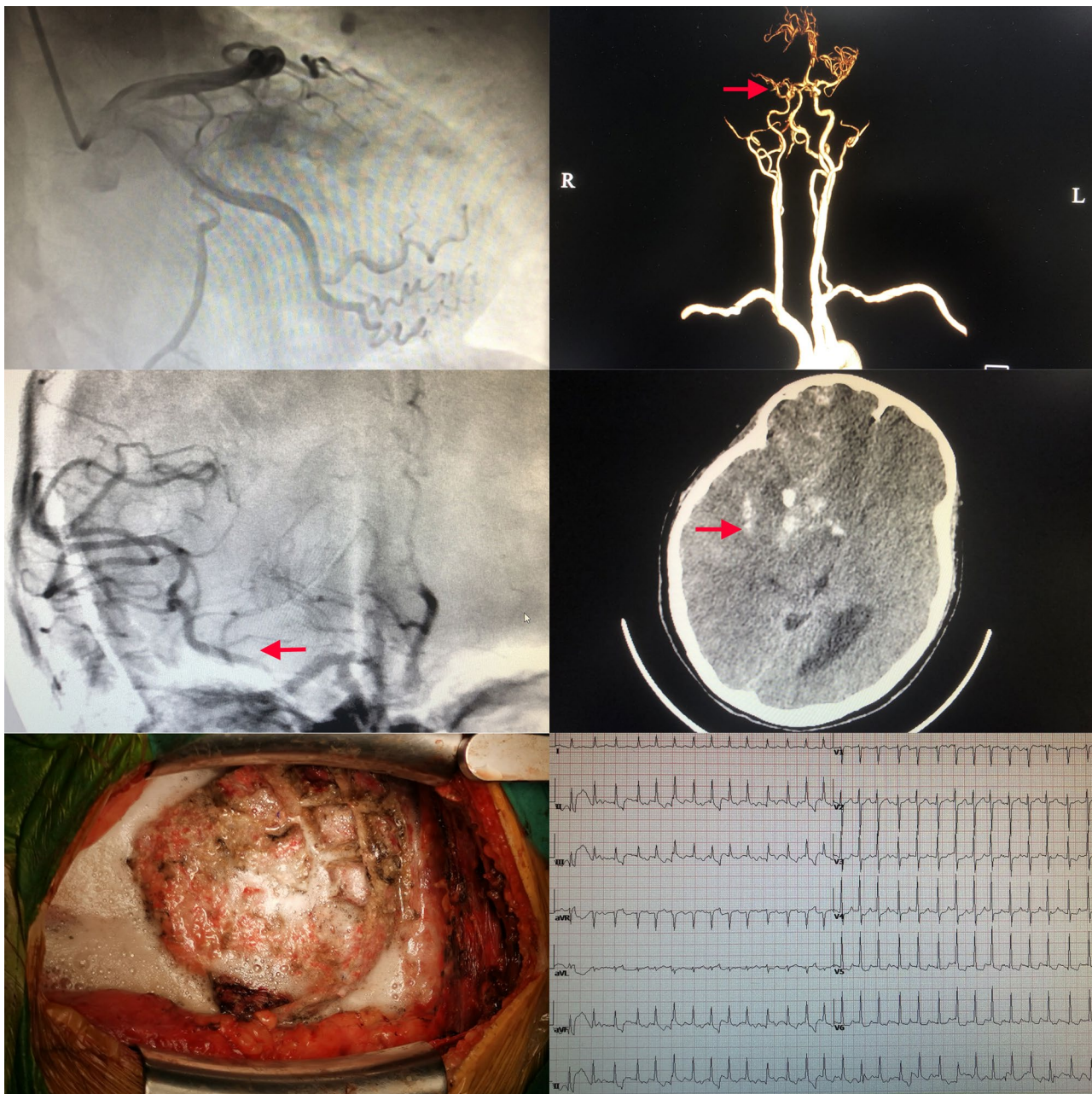


Fig. 1 Fatal cerebral thrombosis after pericardiectomy. Preoperative normal coronary artery radiography (Top-left). The embolism of the right middle cerebral artery (Top-right). Complete recanalization of the thrombosed vessel (Middle-left). Progressive cerebral image (Middle-right). The nonpliable pericardium (Lower-left). Postoperative atrial fibrillation and rapid ventricular rates (Lower-right)

procedure. Although perioperative transthoracic echocardiography and intraoperative transesophageal echocardiography did not reveal low-cardiac output syndrome or regional wall motion abnormalities, the persistence of nonpliable pericardium encasing the left ventricular wall (Fig. 1, Lower-left) limited local myocardium motor [1], pro-coagulable state due to thermal transmission during decortication like radiofrequency ablation [2] under the condition of postoperative atrial fibrillation [3] and rapid ventricular rates (Fig. 1, Lower-right) precipitated the

information of mural thrombus in cardiac cavity [4] and migration into the main branch of the aortic arch [5]. The protocol of aggressive anticoagulation prophylaxis would be recommended for the patients undergoing pericardiectomy [6]. Currently, there is a paucity of international guidelines or expert consensus on accident stroke prevention after cardiac surgical procedures, and standardized management flowcharts and operative protocols need to be concisely developed for severe stroke. Multiple-discipline workgroup [7] consisting of at least chief cardiac

surgeons, on-duty neurointerventional physicians, and on-call neurosurgeons should be prepared and prompt thrombectomy or even decompressive craniectomy are also actively initiated for life salvage of the patient undergoing cardiac surgical procedure and rare onset of fatal cerebral thrombosis.

Author contributions

JQ and YT wrote the main manuscript text and prepared Fig. 1. HKL and HB performed the cardiac and interventional procedure, respectively. HX contributed to the multiple discipline consultation. HSS provide critical comment on this case development. All authors read and approved the final revised manuscript. All authors contributed to editorial changes in the manuscript.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethical approval

The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Due to retrospective nature of study the Ethic Committee Board of Sichuan Provincial People's Hospital waived the need to obtain informed consent.

Consent for publication

Not applicable.

Consent to participate

Not applicable.

Competing interests

The authors declare no competing interests.

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References

1. Boutayeb A, Mahfoudi L, Marmade L, Bensouda A, Moughil S. Apical thrombus after pericardiectomy for constrictive pericarditis. *J Cardiothorac Vasc Anesth.* 2015;29:e13–4.
2. Jiang Q, Liu SZ, Jiang L, Huang KL, Guo J, Hu SS. Comparison of two radiofrequency ablation devices for atrial fibrillation concomitant with a rheumatic valve procedure. *Chin Med J (Engl).* 2019;132:1414–9.
3. Jiang Q, Huang K, Yin L, Kong H, Yang Z, Hu S. Effect of ticagrelor versus clopidogrel after off-pump coronary artery bypass grafting on postoperative atrial fibrillation, a cohort study. *J Am Heart Assoc.* 2024;13(16): e035424.
4. Gupta S, Kahn RA. Image in clinical medicine. Left ventricular thrombus. *N Engl J Med.* 2002;346(18):e5.
5. Jiang Q, Huang K, Wang D, Xia J, Yu T, Hu S. A comparison of bilateral and unilateral cerebral perfusion for total arch replacement surgery for non-marfan, type a aortic dissection. *Perfusion.* 2024; 39(6):1070–9.
6. Jiang Q, Xiang B, Wang H, Huang K, Kong H, Hu S. Remote ischaemic preconditioning ameliorates sinus rhythm restoration rate through Cox maze radiofrequency procedure associated with inflammation reaction reduction. *Basic Res Cardiol.* 2019;114(3):14.
7. Jiang Q, Huang K, Zhao D, Xiao Y, Ma X, Hu S. Innovations and developments in totally thoracoscopic cardiac procedures. *Heart Surg Forum.* 2024;27(4):E424–30.

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