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Systemic thrombosis after cardiopulmonary bypass in a patient with systemic lupus erythematosus

Ghassan Aljafar MD
Baystate Health, Ghassan.Aljafar@baystatehealth.org

Stanlies D’Souza MD
Baystate Health, dsouzastan@yahoo.com

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INTRODUCTION
Systemic Lupus Erythematosus (SLE) is associated with a hypercoagulable state. We report a case of fatal systemic thrombosis following protamine administration after cardiopulmonary bypass.

CASE DESCRIPTION
A 58 year-old female with hypertension, diabetes mellitus, SLE and severe CHF (with severe mitral and tricuspid regurgitation) underwent mitral valve replacement and tricuspid valve annuloplasty via Heartport surgery. Post CPB, TEE showed reduced biventricular function and relative stability on intravenous infusions of epinephrine, norepinephrine and inhalational epoprostenol.

Acute hemodynamic deterioration occurred 60 minutes after chest closure with brady-asystolic arrest. CPR per ACLS protocol was initiated and invasive arterial pressures were used to guide depth and frequency of chest compressions. TEE showed intra-mural thrombus in the descending aorta and re-heparinization followed by recannulation for CPB encountered high line pressures. After a failed CPR attempt, resuscitation efforts were terminated.

REFERENCES
3. Indian J Thorac Cardiovasc Surg 2010;26:292-4

DISCUSSION
Among the spectrum of thrombotic disorders is SLE. The risk of thrombosis is significantly increased in patients with autoimmune diseases particularly:
- SLE with lupus anticoagulant (in fact pro-coagulant) and/or anti-phospholipid antibodies
- Stroke
- Thromboembolism
- Right atrial thrombosis and coronary sinus thrombosis (possible sources of recurrent pulmonary embolism) have been reported.

Potential causes for thrombosis post CPB include:
- Long bypass time
- Use of anti-fibrinolytic agents
- Use of protamine
- Anti-thrombin III deficiency
- Protein C and protein S deficiency
- Homocysteinemia
- Transfusion of blood products
- Autoimmune disorders causing vasculitis and collagen vascular disorders
- Anti-cardiolipin and anti-phospholipids anti-bodies

Other causes contributing to hypercoagulability include:
- Malignancy
- Pregnancy
- Myeloproliferative disorders
- Diabetes and many others

Our patient had multiple risk factors for thrombosis most importantly:
- SLE
- Long bypass time (200 minutes)
- Infusion of anti-fibrinolytic agent (Amicar)
- Protamine administration for heparin reversal

The patient has a history of cardiac arrest at the age of 27 post delivery which could potentially have been due to a thrombotic cardiovascular event. In this case, it is unknown whether the thrombosis occurred before or after cardiac arrest, causes of cardiac arrest should be ruled out and treated accordingly.

TEE is a very useful diagnostic tool in this situation, it can rule out aortic dissection and cardiac tamponade as potential causes. Protamine reaction, anaphylaxis and disseminated intra-vascular coagulation should also be considered.

Re-heparinization to go on CPB might be life saving.

CONCLUSION
Preoperative risk assessment and anticipation of systemic thrombosis may alter the surgical technique and or decision and implement a medical management plan. The anesthesiologist should direct the anesthetic technique to avoid potential triggers whenever possible.