Thrombus in transit raising suspicion for a hypercoagulable state

Arjun Kanwal 1, Jason Kaplan, 2 Beani Forst, 3 Bhavin Patel 4

DESCRIPTION

A patient with recent two-vessel coronary artery bypass graft (CABG) 11 days prior to admission presented with shortness of breath and orthopnea. The procedure was uncomplicated and tolerated well. On arrival he was hypoxic and initial ECG and cardiac enzymes were negative for active ischaemia. Echocardiogram revealed thrombus extending in the right atrium (video 1).

This raised our clinical suspicion for venous thromboembolism.

CT angiogram of the chest demonstrated extensive bilateral pulmonary emboli including a saddle thrombus. Extensive thrombus was also noted within the inferior vena cava, iliac veins and common femoral veins. The patient was found to have heparin-induced thrombocytopenia (HIT) with significant serum titre of PF4-heparin complex antibodies and started on argatroban. He underwent a redo median sternotomy, atrial exploration and removal of the right atrial clot.

Pulmonary arteriotomy and extraction of clot from the main, right main and left main pulmonary arteries with suction aspiration of the main lobar branches of each lung were performed (figure 1). He was discharged on anticoagulation and at follow-up the patient had no further shortness of breath.

HIT is commonly suspected in the patient population who underwent cardiac surgery; however, the incidence is only between 1% and 2%. 1 Cardiac thrombosis in patients with HIT has been demonstrated in the literature, however, it is exceedingly rare. Management of these patients can be difficult as the standard of care in cardiac and pulmonary embolism requires exposure to unfractionated heparin. Tirofiban, a glycoprotein IIb-IIIa inhibitor has been used in such patients with favourable outcomes. 2 Agatroban has also been studied, however less so and its efficacy is still under question. Bivalirudin, a direct thrombin inhibitor, has been a well-documented alternative used during percutaneous coronary interventions and has become more popularised in coronary bypass in patients with heparin hypersensitivity. 3 Due to its rapid anticoagulation effect, short half life and other favourable pharmacological properties, the use of bivalirudin in the operating room is rapidly growing. 4 In 2007, the CHOOSE-ON trial treated 50 patients with confirmed for suspected HIT with bivalirudin, demonstrating a safe and effective anticoagulation strategy. 5 Bivalirudin has been very well studied as an alternative to heparin for cardiopulmonary bypass (CPB) and is included in the clinical guidelines for anticoagulation on CPB. Ongoing prospective, randomised clinic trials are still needed to help establish the efficacy and appropriate protocols for alternatives to heparin usage in the operating room during CABG.

Twitter Arjun Kanwal @arjun.kanwal

Contributors All four authors were involved in the completion of this manuscript. AK was involved in creating the manuscript. JK was involved in editing the manuscript. BF was involved in acquiring the images. BP was involved in editing images and editing manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iD Arjun Kanwal http://orcid.org/0000-0002-6370-289X

Figure 1 Clot extraction from the main, right main and left main pulmonary arteries with suction aspiration of the main lobar branches of each lung remaining in the shape of the artery.

Learning points

- Cardiac thrombosis is rare after heparin-induced thrombocytopenia, however the diagnosis should be considered in patients with cardiac thrombi if they have received heparin.
- Heparin-induced thrombocytopenia incidence is 1%–2% in population who underwent cardiac surgery.
REFERENCES