

Coming unstuck: thrombolysis for prosthetic aortic valve thrombosis

Introduction

Prosthetic valve thrombosis is a potentially fatal complication of valve replacements. A quick, effective and easy to use non-invasive method is highly desirable for diagnosis and subsequent follow up of patients with prosthetic valve thrombosis.

This article discusses the presentation of a patient with mechanical aortic valve thrombosis while on dabigatran. Cinefluoroscopy was used in conjunction with transthoracic echocardiography for rapid and effective diagnosis of prosthetic valve thrombosis. Cinefluoroscopy and transthoracic echocardiography are an effective diagnostic tool in most cases of prosthetic valve thrombosis and the pivotal role of adequate anticoagulation with warfarin in all patients with mechanical heart valves is highlighted. This patient elected to have thrombolysis because of significant comorbidities and was successfully treated. The choice between surgery and thrombolysis is complex and high risk regardless of the option taken, and the risk and benefits should be individualized to each patient.

Discussion

The risk of prosthetic valve thrombosis varies with valve type and position and should be suspected promptly in any patient with a prosthetic heart valve who presents with either dyspnoea or an embolic event. In clinical practice, transthoracic echocardiography and transoesophageal echocardiography are routine imaging modalities to evaluate suspected prosthetic valve thrombosis. The introduction of transoesophageal echocardiography has led

to a decline in the use of cinefluoroscopy which is an effective, readily available and non-invasive technique for assessment of mechanical heart valves (Gürsoy et al, 2015).

Transthoracic echocardiography is usually the first modality in detecting prosthetic valve thrombosis and can assess the severity of obstruction by measuring the trans-

valvular gradient and Doppler velocity index. Cinefluoroscopy is particularly useful in settings where echocardiography or cardiology expertise is not immediately available as the discs can be easily visualized and the opening and closing angles measured. It is a complementary method to echocardiography and also plays a role in

CASE REPORT

A 49-year-old Caucasian man presented with a 3-day history of worsening shortness of breath associated with left pleuritic chest pain and cough productive of brown sputum. He denied any pyrexia. When the paramedics arrived, he was found to be in respiratory distress, unable to complete sentences and pale. He had a respiratory rate of 24 breaths per minute with oxygen saturations of 86% on air, heart rate of 96 beats per minute and blood pressure of 103/55 mmHg.

He was started on oxygen, nebulised salbutamol and ipratropium bromide with no effect. He was subsequently given intramuscular adrenaline and intravenous hydrocortisone which eased his work of breathing. On arrival at the emergency department, his clinical condition had markedly improved. Examination showed some reduction of air entry into the right base and the presence of a loud systolic murmur.

His significant past medical history included a type A aortic dissection 18 years ago requiring surgical replacement of his aortic valve and aortic root with a mechanical prosthesis. He subsequently developed a large thoraco-abdominal aneurysm necessitating the replacement of his whole aorta down to the bifurcation 9 years later. He had an open repair of residual dissection and aneurysm formation in both common iliac arteries 1 year before this presentation complicated by postoperative sepsis with his left upper rectus muscle developing into an abscess necessitating a long course of intravenous antibiotics.

He was on inhalers for his chronic obstructive pulmonary disease, analgesia for chronic pain and dabigatran 150 mg twice daily for his mechanical heart valve. He has a history of variable compliance with his medications, and periods of alcoholic binging which led to his

warfarin being switched to dabigatran 2 years before admission.

High sensitivity troponin level was raised at 80 ng/litre (reference <34 ng/litre) (at presentation) and 140 ng/litre (3 hours later) and the D-dimer level was 1827 ng/ml (reference <250 ng/ml). Electrocardiogram showed sinus rhythm with evidence of left ventricular strain but was essentially unchanged from 6 months previously. Computed tomography pulmonary angiogram was negative for a pulmonary embolus. Renal function was normal.

He was subsequently transferred to the coronary care unit where transthoracic echocardiography showed severe left ventricular impairment and a peak pressure gradient across the aortic valve replacement of 68 mmHg which had progressed from mild left ventricular impairment and peak pressure gradient of 25 mmHg 6 months previously. Following suspicion of mechanical aortic valve thrombosis, cinefluoroscopy was performed which showed no movement of one of the leaflets of the aortic valve, and a marked reduction in movement of the other leaflet (*Figure 1a* and video on www.bjhm.co.uk).

He was discussed with the national valvular unit and transferred the following day for surgical review. Surgery was felt to be particularly high risk given the residual complex dissection anatomy within the aortic arch, extending into the supra-aortic branch vessels, so thrombolysis was administered. He felt substantially better during the infusion, with subsequent cinefluoroscopy showing full leaflet motion (*Figure 1b* and video on www.bjhm.co.uk). Warfarin has been recommenced with the aim of achieving an international normalized ratio of 3–4 for the first 6 months then an international normalized ratio of 2.5–3.5.

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