Case Report

Delayed Diagnosis of Pulmonary Artery Thrombosis in a Patient Undergoing Mitral Valve Replacement

Devishree Das, Neeti Makhija, Suruchi Hasija, Mohit Prakash

Department of Cardiac Anaesthesia and Critical Care, Cardiothoracic Centre, AIIMS, New Delhi, Delhi, India

ABSTRACT

The occurrence of pulmonary artery thrombus in association with rheumatic mitral stenosis is a rare complication. Pulmonary artery thrombus formation may worsen pulmonary artery pressures, and this may precipitate acute right heart failure. The possible mechanisms behind pulmonary artery thrombus formation during mitral valve replacement surgery could be acute coagulopathy following surgery, the presence of chronic pulmonary thromboembolism, or chronic atrial fibrillation. We report an unusual case of pulmonary artery thrombus in a patient with rheumatic MS which was diagnosed with transoesophageal echocardiography after MVR.

Keywords: COVID infection, mitral stenosis, mitral valve replacement, pulmonary artery thrombosis, trans oesophageal echocardiography

Address for correspondence: Dr. Neeti Makhija, Room No. 9, 7th Floor, Department of Cardiac Anaesthesia and Critical Care, Cardiothoracic Centre, All India Institute of Medical Sciences, Ansari Nagar, New Delhi - 110 029, Delhi, India.
E-mail: neetimakhija@hotmail.com

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INTRODUCTION

Rheumatic mitral valve stenosis (MS) is frequently associated with left atrial thrombus with an incidence of 3–13% in patients with normal sinus rhythm, and 33% in patients with chronic atrial fibrillation (AF). However, pulmonary artery thrombus (PT) in association with rheumatic MS is a rare complication in patients undergoing mitral valve replacement (MVR). It may be due to acute coagulopathy following cardiac surgery, chronic pulmonary thromboembolism, or chronic AF. The authors report an unusual case of PT with possible atypical aetiology that was diagnosed after MVR.

CASE REPORT

A 45-year-old female with rheumatic MS, severe tricuspid regurgitation (TR), and left atrial thrombus was admitted for MVR and excision of left atrial thrombus. She was in normal sinus rhythm and was on oral anticoagulation therapy. The prebypass trans-oesophageal echocardiography (TOE) examination confirmed the preoperative diagnosis. As the tricuspid annulus measured 3.52 cm (indexed tricuspid annulus <21 mm/m^2), no intervention was carried out on the tricuspid valve.

After weaning from cardiopulmonary bypass (CPB), the mechanical bi-leaflet mitral prosthesis was noted to be functioning well. However, the right ventricular systolic pressures (RVSP) increased to 60 mmHg (prebypass 46 mmHg), although the right atrial pressures and TR severity were reduced compared to prebypass values. Further characterization, TOE revealed an eccentric thrombus of size 1.19 cm × 2.84 cm in the right pulmonary artery (RPA) [Figure 1 and Video 1].

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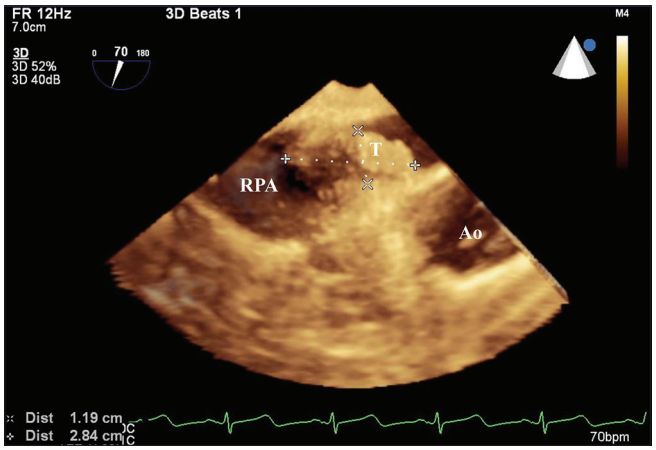

Figure 1: Mid-oesophageal modified ascending aortic (Ao) short axis view focusing on the right pulmonary artery (RPA) showing an eccentric thrombus (T) of size 1.19 cm × 2.84 cm in the RPA with three-dimensional transoesophageal echocardiography

The thrombus was excised from the RPA on normothermic CPB without arresting the heart. The patient was weaned from CPB with support of milrinone 0.5 mcg/kg/min and noradrenaline 0.05 mcg/kg/min. No residual thrombus was seen with TOE after weaning from bypass, and the RVSP was also reduced. After a few hours of mechanical ventilation, the trachea was extubated. The patient revealed that she had a past infection with coronavirus disease 2019 (COVID-19). Further postoperative recovery and hospital stay were uneventful.

DISCUSSION

The occurrence of PT with concomitant MS in a patient with prior COVID-19 infection is unusual. The usual postulated mechanisms of PT following cardiac surgery could be acute coagulopathy, chronic pulmonary thromboembolism, or chronic AF. In the index case, the PT was found before protamine neutralization that possibly excluded acute coagulopathy.[1] Chronic pulmonary thromboembolism commonly originates as venous thromboembolism (VTE) in the lower extremities or in the pelvic veins. PT may also be associated with right atrial spontaneous echo contrast.[2,3] After extubation, our patient denied VTE in the past. Furthermore, she was in sinus rhythm, and there was no evidence of echo contrast or thrombus in the right atrium. This excluded chronic pulmonary thromboembolism and AF as possible causes of the PT.

The patient provided a history of COVID-19 infection 1 year before. COVID-19 either directly causes *in-situ* PT or secondary to VTE.[4] As there was no history of VTE in the past, the aetiology of the PT in the index case could be due to COVID-19 induced *in-situ* pulmonary thrombosis. The lesson learnt is to perform a comprehensive TOE examination before CPB and, if not feasible, at least to visualise the pulmonary arteries, especially in today's post-COVID era.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initial s will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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