

Imaging in Cardiovascular Disease



Large Impending Paradoxical Embolus: Thrombotic Railroading from Right Ventricle to Left Ventricular Outflow

Ankur Agarwal , MD, Ajitkumar Valaparambil , MD, DM,
Krishna Kumar Mohanan Nair , MD, DM, Sivadasanpillai Harikrishnan , MD, DM,
and Deepanjan Bhattacharya , MD

Department of Cardiology, Sree Chitra Tirunal Institute for Medical Sciences and Technology,
Thiruvananthapuram, India

OPEN ACCESS

Received: Aug 18, 2020

Revised: Sep 30, 2020

Accepted: Oct 13, 2020

Address for Correspondence:

Ankur Agarwal, MD

Department of Cardiology, Sree Chitra
Tirunal Institute for Medical Sciences and
Technology, Jai Nagar W Rd, Chalakkuzhi,
Thiruvananthapuram 695011, India.
E-mail: ankurmedicoss@gmail.com

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ORCID iDs

Ankur Agarwal

<https://orcid.org/0000-0002-3794-2646>

Ajitkumar Valaparambil

<https://orcid.org/0000-0002-3526-3869>

Krishna Kumar Mohanan Nair

<https://orcid.org/0000-0002-3313-3462>

Sivadasanpillai Harikrishnan

<https://orcid.org/0000-0001-8754-4243>

Deepanjan Bhattacharya

<https://orcid.org/0000-0002-4823-7045>

Conflict of Interest

The authors have no financial conflicts of
interest.

Clots in transit represent the embolized fragments of deep vein thrombosis, which are seen in cardiac chambers during transit.^{1,2)} Impending paradoxical emboli are seen in the situation of high right atrial pressure compared to the left atrium where clots gets caught in the patent foramen ovale or rarely in an atrial septal defect. Despite management, a mortality rate of 18% has been seen in patients with clots in transit.³⁾

The present case is a forty-five year old female with a history of seizure disorder and diabetes. The patient was bed ridden and developed bilateral pedal swelling over the past 2 months. She had sudden onset of dyspnea at rest with no report of angina, palpitations, syncope, or orthopnea. The patient was in hypotension with a blood pressure of 80/50 mm Hg, tachycardia, and a low volume pulse. Respiratory rate was high, up to thirty-five breaths per minute, and of the thoracoabdominal type. Bilateral pedal edema was present with calf tenderness. Jugular venous pressure was raised with no cardiomegaly, and normal S1, loud P2, and RVS3 were heard. The bilateral chest was clear with no features of pulmonary edema.

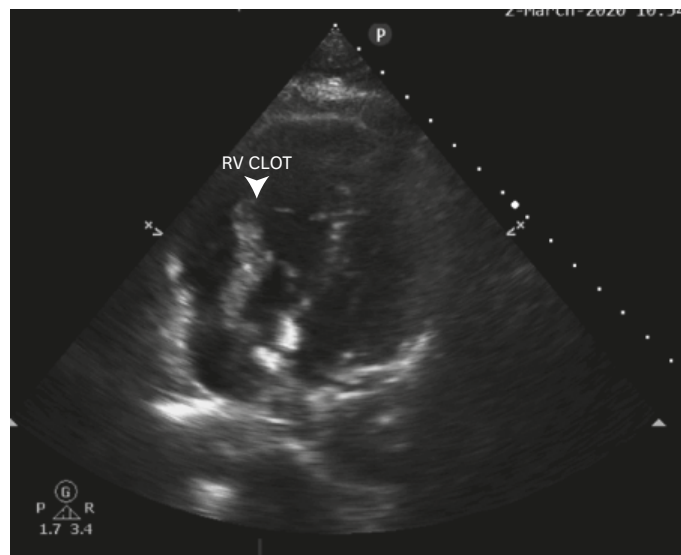


Figure 1. Transthoracic echocardiogram apical 4 chamber view showing a large embolic clot that extended from the right atrium into the RV.
RV: right ventricle.

Author Contributions

Supervision: Valaparambil A, Nair KKM, Harikrishnan S; Writing - original draft: Agarwal A, Valaparambil A, Nair KKM, Harikrishnan S, Bhattacharya D; Writing - review & editing: Agarwal A, Valaparambil A, Nair KKM, Harikrishnan S, Bhattacharya D.

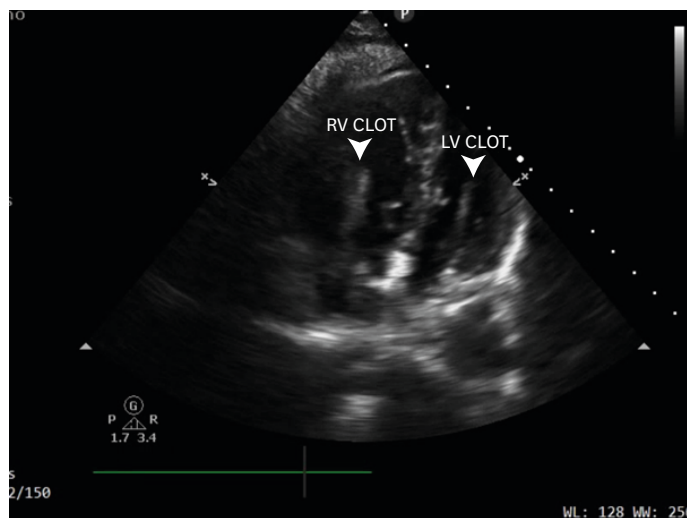


Figure 2. Apical 4 chamber view showing an embolic clot that protruded into the RV and LV. LV: left ventricle, RV: right ventricle.

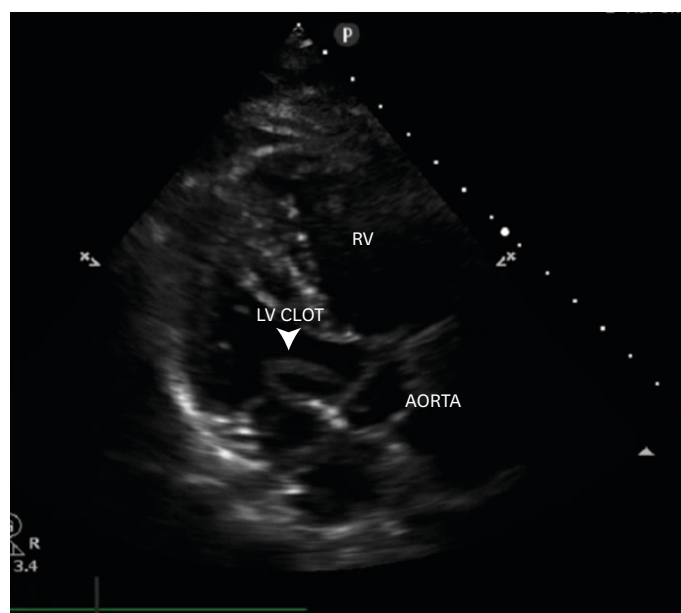


Figure 3. Parasternal long axis view showing a LV clot that protruded into the aorta. LV: left ventricle, RV: right ventricle.

The electrocardiogram showed sinus tachycardia with T inversion in the V1 to V3 leads and an S1Q3T3 pattern. Lower limb doppler showed left lower limb deep vein thrombosis involving the iliofemoral vein. A computed tomography (CT) pulmonary angiogram was done at the primary referring hospital which showed bilateral acute thrombus in the right and left proximal pulmonary arteries, suggestive of acute pulmonary embolism with no intracardiac mass noted. The patient's echocardiogram at our center revealed a positive McConnell sign and a large thrombus across the right atrium and right ventricle (**Figures 1 and 2**). The clot extended from the left side of the interatrial septum to the mitral valve and extended across the aortic valve (**Figure 3**). Findings were suggestive of a large paradoxical clot in transit.

The patient was started on oxygen support and inotropes. Risks involved with thrombolysis and surgery were explained to the patient's bystanders, and they opted for thrombolysis. The patient subsequently underwent thrombolysis with half dose alteplase (50 mg) as an infusion over 6 hours.⁴⁾ Post-thrombolysis echocardiogram showed complete resolution of the ventricular clot with improved right ventricular function. Repeat CT pulmonary angiogram revealed no thrombus in the proximal pulmonary arteries. The patient improved hemodynamically and was continued on anticoagulation.

REFERENCES

1. Corrin B. Paradoxical embolism. *Br Heart J* 1964;26:549-53.
[PUBMED](#) | [CROSSREF](#)
2. Nellessen U, Daniel WG, Matheis G, Oelert H, Depping K, Lichtlen PR. Impending paradoxical embolism from atrial thrombus: correct diagnosis by transesophageal echocardiography and prevention by surgery. *J Am Coll Cardiol* 1985;5:1002-4.
[PUBMED](#) | [CROSSREF](#)
3. Myers PO, Bounameaux H, Panos A, Lerch R, Kalangos A. Impending paradoxical embolism: systematic review of prognostic factors and treatment. *Chest* 2010;137:164-70.
[PUBMED](#) | [CROSSREF](#)
4. Seo WW, Kim SE, Park MS, et al. Systematic review of treatment for trapped thrombus in patent foramen ovale. *Korean Circ J* 2017;47:776-85.
[PUBMED](#) | [CROSSREF](#)