Large embolic clot in transit straddling across patent foramen ovale- Thrombotic railroading from LV outflow to right ventricle

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Abstract

Clot in transit represent the embolized fragment of deep vein thrombosis seen in cardiac chamber during its transit. Impending paradoxical emboli is seen in situation with high right atrial pressure than left atrium where clot gets caught in the patent foramen ovale or rarely atrial septal defect. High mortality of upto 18% has been seen in patients with paradoxical embolus in transit. Current case demonstrates patient with acute massive pulmonary embolism with large clot in transit seen in right side of heart extending across atrial septum to the left side of heart, extending across the aorta valve.

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Patient is a fourty five year old lady with history of seizure disorder and diabetes. Patient was being being followed up with neurologist in view of recurrent absent seizures, with memory loss and was on multiple antiepileptic drugs since years. Since last one year, patient was bed ridden and developed bilateral pedal swelling over last two months. She had sudden onset dyspnoea at rest with no complain of angina, palpitations, syncope or orthopnoea. Patient was in hypotension with BP of 80/50 mm Hg with tachycardia and low volume pulse. Respiratory rate was high, upto thirty five per minute and thoracoabdominal pattern. Bilateral pedal edema was present, and jugular venous pressure was raised. There was no cardiomegaly, heart sounds were normal with loud P2 and RVS3. Bilateral chest was clear with no features of pulmonary edema.

Electrocardiogram showed sinus tachycardia with T inversion in V1 to V3 leads and S1Q3T3 pattern. Lower limb doppler showed left lower limb deep vein thrombosis involving illiofemoral vein. CT pulmonary angiogram was done from referring hospital which showed bilateral acute thrombus in right and left proximal pulmonary artery suggestive of acute pulmonary embolism. Patient's echocardiogram revealed positive McConnel sign and a large thrombus across right atrium and right ventricle attached to the interatrial septum. Clot was extending from left side of interatrial septum to mitral valve and extending across aortic valve.[Fig 1-3] Findings were suggestive of a large paradoxical clot in transit. Patient was started on oxygen support and inotropes. Thrombolysis was planned with half dose alteplase (50 mg) as slow infusion over 6 hours. Post thrombolysis echocardiogram showed complete resolution of LV clot with improved right ventricular function and decrease in RV systolic pressures. Though patent foramen ovale (PFO) was not demonstrated on contrast echocardiogram. Repeat CT pulmonary angiogram post thrombolysis revealed no thrombus in bilateral proximal pulmonary arteries and some residual clot was present in distal subsegmental branches. Patient improved hemodynamically and was continued on anticoagulation.

Discussion

Clot in cardiac chamber has been divided into three types: Type A- large serpiginous clot which is freely mobile and has high risk of thromboembolism, likely source of which is deep vein thrombosis; Type B -

originates in cardiac chamber and is firmly attached to wall, so has less chances of embolism; Type C- originates in cardiac chamber, highly mobile resembling myxomas.[1] Clot in transit represent the embolized fragment of deep vein thrombosis which is seen in cardiac chamber during its transit, hence represent Type A clot. Impending paradoxical emboli is seen in situation with high right atrial pressure than left atrium where clot gets caught in the patent foramen ovale or rarely atrial septal defect.

Clot in transit at PFO or an impending paradoxical emboli was first reviewed by Corrin in 1964 based on autopsy, and first recognized by echocardiography in 1985 by Nellessen et al.[2,3]It has high risk of both systemic and pulmonary thromboembolism, and thus associated with high mortality. Case reports of clot in transit patients suggest associated pulmonary embolism in upto 91% and systemic embolism in upto 55% cases. Based on one of the largest systemic review, which studied the three treatment modalities that is thrombolysis, surgical embolectomy and anticoagulation alone, there was no survival benefit seen with thrombolysis or surgical embolectomy over anticoagulation alone. Also, the risk of embolic events was found to be higher post thrombolysis compared to embolectomy. Despite management, the mortality rate of 18 % was found in patients with clot in transit.[4] Another systemic review which included cases published from 1991-2015, overall mortality reported was 14%. Results on sub-analysis showed that mortality after 2005 was higher with thrombolysis compared to surgical intervention, correlating with improved surgical techniques.[5] As there are no randomized trials, no definitive guidelines are there for management of the same. The preferred strategy by most remains surgical embolectomy because of high risk of systemic emboli associated with thrombolysis. But in patients who are hemodynamic unstable with associated high surgical risk, thrombolysis can be considered.

Patient presented with deep vein thrombosis, acute massive pulmonary embolism with cardiogenic shock. Because of massive pulmonary embolism the right ventricle and right atrial pressures were high, which could have stretched open the foramen ovale. Through the defect large embolic clot entered into left side of heart and was seen as a serpiginous mobile mass protruding across mitral valve into the aortic valve.

Conclusion

This unique case demonstrated the massive thrombus in transit forming a thrombotic railroading from left ventricular outflow extending upto right ventricular cavity .

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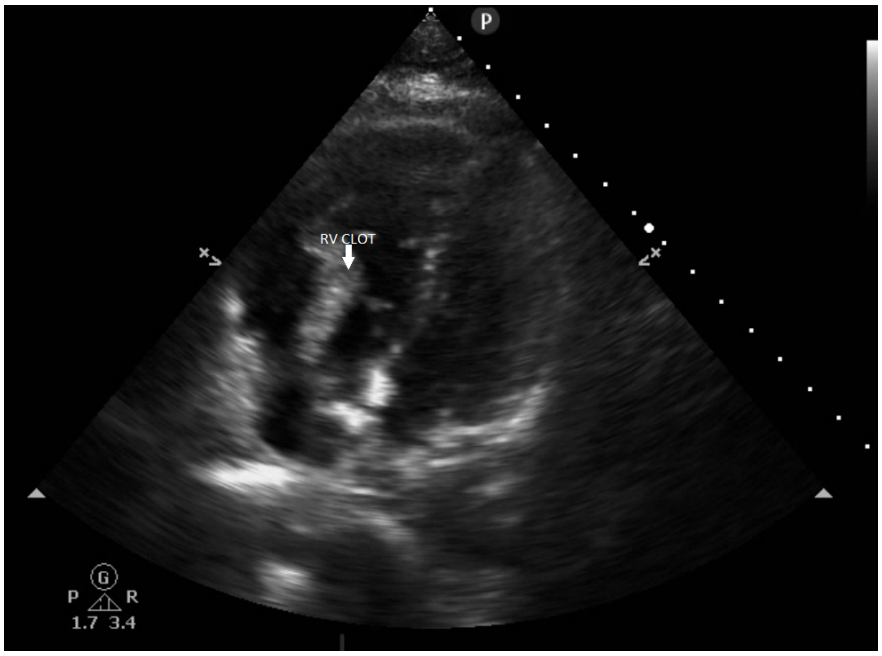

Figure 1- Apical 4 chamber view showing thrombus in transit protruding into right ventricular cavity

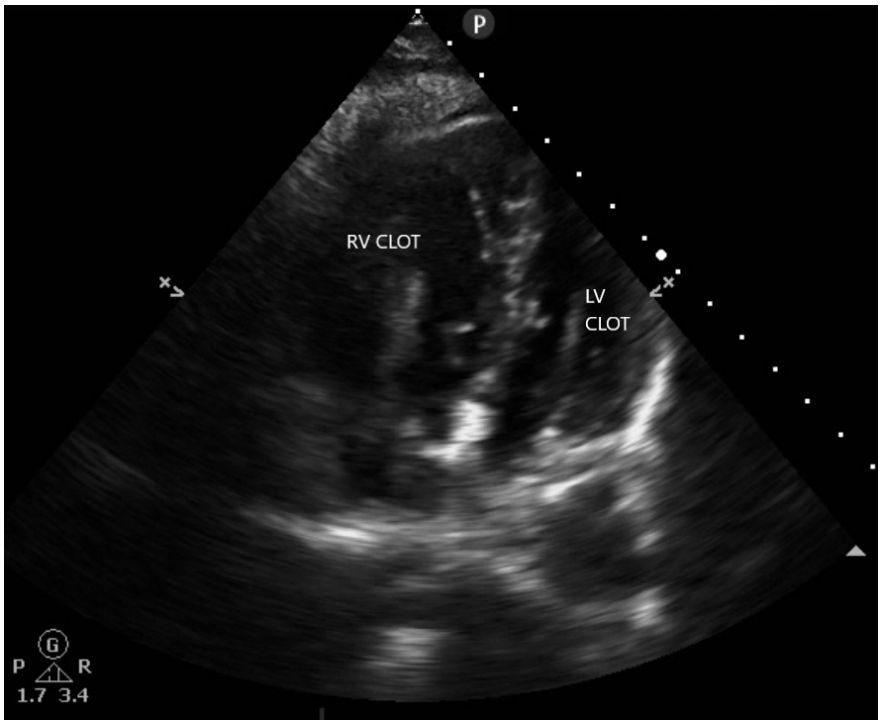

Figure 2- Apical 4 chamber view showing thrombus in transit across interatrial septum, protruding into right and left ventricular cavity

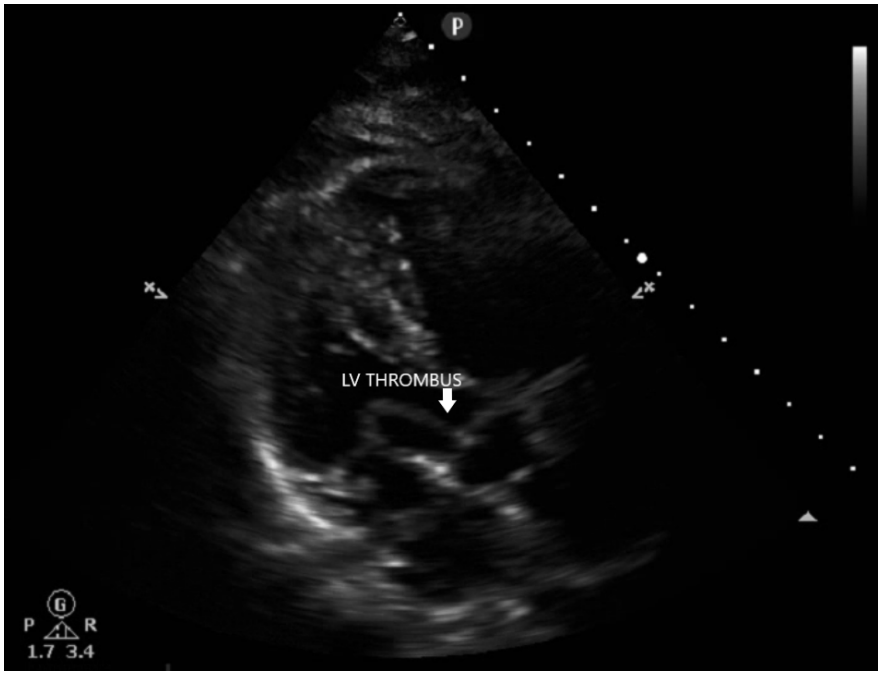

Figure 3- PLAX view showing thrombus in transit protruding across aortic valve