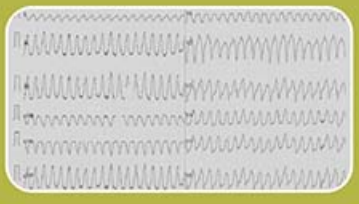
Complimentary Online 154 Videos Duration 15 minutes

Learn Clinical Reasoning in

Cardiology Through Cases

Shyam S Kothari

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Contents

CASE

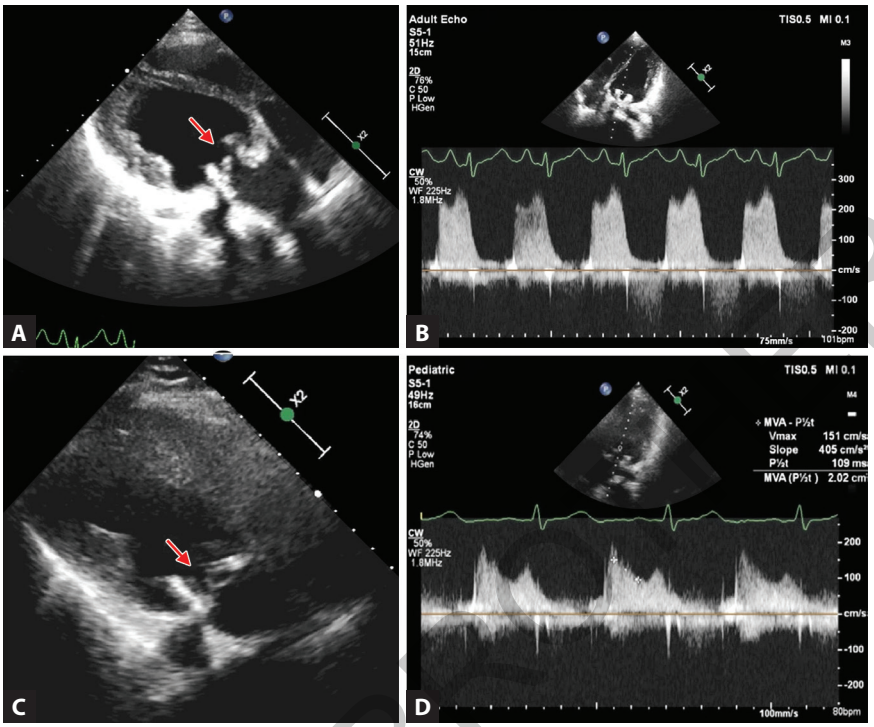
1

Prosthetic Heart Valve Thrombosis

"I cannot teach anybody anything. I can only make them think."

—Socrates

A 30-year-old man had mitral valve replacement with a mechanical prosthetic mitral valve for calcific rheumatic mitral stenosis. He suffered from two episodes of prosthetic heart valve thrombosis (PHVT). The PHVT episodes were treated with thrombolysis, but the second episode responded only partially. Subsequently, the mechanical valve was replaced with a bioprosthetic mitral valve. He was on regular follow-up. The last follow-up 6 months earlier showed well-functioning mitral bioprosthesis. He reported a recent increase in breathlessness for 1 month and the echo-Doppler is shown below (upper strip, **Figs. 1A and B, Videos 1 and 2**). The echo in **Figures 1C and D** and **Videos 3 and 4** were obtained after some treatment.



Figs. 1A to D: (A) Thickened and incompletely opening mitral valve bioprosthesis with high Doppler gradients (B) suggestive of prosthetic heart valve thrombosis (PHVT). (C and D) Thinned leaflets and markedly reduce gradients across mitral valve after treatment **(*see* Videos 1, 2, 3, and 4 also)**.

He was not thrombolyzed or reoperated. What could be the possible diagnosis and treatment?

Video 1 **Video 2** **Video 3** **Video 4**

Pause and think before you click the answer:

Answer: The patient suffered from bioprosthetic valve thrombosis as seen by the high gradients across mitral valve in Figure 1B. The change was recent and therefore it was not like a bioprosthetic valve degeneration. Further, it has improved. This patient had recurrent prosthetic valve thrombosis of mechanical valve previously and therefore a bioprosthesis was implanted. Unfortunately, the bioprosthesis also showed thrombosis.

The cause of PHVT in this patient was eosinophilia-induced thrombosis. On this admission, he had eosinophilia (77%) with an absolute eosinophilic count of 25,000/mm^3. The thrombosis disappeared after treatment with steroids, diethylcarbamazine, and heparin as seen in Figures 1C and D.

Learning points: Eosinophilia-induced thrombosis remains an under-recognized entity despite many case reports. Several cases of recurrent PHVT have been published where the eosinophilia has not been recognized and repeat surgeries have been performed for the PHVT, resulting in rethrombosis. Obviously, eosinophilia needs to be treated to prevent the recurrences. The treatment of eosinophilia would depend on the cause of eosinophilia. Eosinophilia-induced thrombosis might occur despite recommended international normalized ratio (INR). These patients may be maintained on a higher INR, but that is empirical. At least some cases of PHVT in Indian settings might be due to eosinophilia (that is not uncommonly seen in general population). Eosinophils cause thrombosis due to cationic protein release as seen in Loffler's syndrome resulting in ventricular thrombosis and endomyocardial fibrosis.

(*Source:* Kothari SS, Deepti S, Rai N. Reversible bioprosthetic valve thrombosis from eosinophilia. BMJ Case Rep. 2018 Feb 8;2018:bcr2017222937. doi: 10.1136/bcr-2017-222937.)

Sidelights:

1. **Can you have normal Doppler gradients with PHVT?**
2. **Which is a better test for PHVT-echocardiography or fluoroscopy?**
3. **Does thrombolytic therapy influence prothrombin time (PT) and activated partial thromboplastin time (aPTT)?**
4. **Why PHVT is more common in Indian patients?**
5. **What happens to patients with 1 leaflet of a bileaflet prosthetic heart valve partially stuck?**

(*Sidelights are food for thought—provided to increase your curiosity:* So as a rule, do not read these answers before you try to answer them yourself. The answers provided here are not intended to be exhaustive.)

Answer: The Doppler gradients may not be high if only 1 leaflet of a bileaflet prosthetic valve is stuck, or the valve area is not much compromised despite the thrombus, although absolutely normal gradients or a completely normal pattern would be uncommon. Because of this fact, fluoroscopic examination is preferred for PHVT if the prosthetic valve is seen on fluoroscopy (TTK chitra valve is not seen on fluoroscopy).

- Thrombolytic therapy prolongs both PT and aPTT.
- Most Indian series of patients with PHVT report a much higher incidence of PHVT in patients than that reported from the other parts of the world (6–10/100 patient years in India vs. 0.3–1.3/100 patient years in western series). PHVT is common in Indian patients due to several reasons. Less adequate INR monitoring, less time in therapeutic range, dietary variations, and poor patient compliance are the commonly cited reasons. However, an equally important reason also is that the patients are operated late with higher prevalence of large left atria, atrial fibrillation, and ventricular dysfunction amongst other factors.
- The fate of patient with 1 leaflet stuck after thrombolytic therapy for PHVT (when they are hemodynamically stable and symptomatically better) is not well known. Many patients are on follow-up with high INR due to unavailability/unfeasibility of repeat surgery; however, repeat PHVT with sudden deterioration might occur. It seems an unwise strategy to follow these patients on high INR only. Very careful follow-up is mandatory. Large objective data regarding this subset of patients are not available.

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The book is intended to stimulate clinical reasoning by providing a brief story of the patient and a question. It contains 50 chapters, over 150 echo videos, learning points, and some sidelights; and includes aspects of heart failure, pulmonary hypertension, pericardial disease, and other miscellaneous cardiology topics in children and adults. The book is probing, entertaining, and informing in an informal way that would increase the reader's sense of wonderment and stimulate further learning.

Shyam S Kothari is an eminent teacher of cardiology who has taught at the All India Institute of Medical Sciences, New Delhi, India, for over 30 years. "The mind is not a vessel to be filled, but a fire to be kindled" has been an overarching obsession with him. In this small book of cardiology cases, he invites the students to explore different facets of cardiology with a view to stimulate clinical thinking.

Shelving Recommendation
CARDIOLOGY

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