Needle in the Heart

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A 49-year-old woman was admitted to the hospital after a self-insertion of a needle into her chest. She had a history of schizoaffective disorder, depression, and past suicide attempts. At admission, she was complaining of acute chest pain. ECG showed minimal ST-segment elevation (0.5 to 1.0 mm) in the precordial leads and in leads II, III, and aVF (Figure 1). Transthoracic echocardiogram showed a normally-sized left ventricle with low-normal systolic function assessed by biplane Simpson’s method (ejection fraction 51%). Neither left ventricular hypertrophy nor regional wall motion abnormalities were observed. There was a strong linear echo-reflecting structure measuring \( \frac{1}{3} \) by 2.0 cm visible in the left ventricular cavity. It was passing through the anterior mediastinum, right ventricular free wall, and interventricular septum and entering the left ventricular cavity at the lower border of the left ventricular outflow tract (Figure 2A).

During diastole, the anterior mitral valve leaflet was resting on this structure, resulting in thrombus formation at the tip of the leaflet measuring up to 0.8 cm (Figures 2B, 2C, and 3A).

Unrelated to this self-injury, there was a mild/moderate-sized muscular ventricular septal defect positioned in the middle third of the interventricular septum (Figure 3, B and C). Both atria were of normal size. The right ventricle was of normal size with good systolic function and mild tricuspid regurgitation. Right ventricular systolic pressure was estimated at 35 mm Hg. There was no pericardial effusion.

Cardiac surgery on the following day confirmed the echocardiographic findings. A 5.0-cm sewing needle at 3.0 cm below the aortic valve was removed, the anterior mitral valve leaflet was freed from the thrombus, and the ventricular septal defect was repaired.

Figure 1. Twelve-lead ECG showing sinus rhythm, a ventricular rate of 84 beats per minute, and ST-segment elevation in the precordial leads (up to 1.0 mm), and in leads II, III, and aVF.
Figure 2. Transthoracic echocardiogram, parasternal long-axis view. A, Note a strong echo-reflecting structure (sewing needle) visible inside the left ventricle (arrow). B (systole), Note oval-shaped soft tissue echo-structure (thrombus) located on the tip of the anterior mitral valve leaflet. C (diastole), Anterior mitral valve leaflet is resting on the tip of the needle, resulting in fresh thrombus formation. RV indicates right ventricle; LV, left ventricle; LA, left atrium; and Ao, aorta.

Figure 3. Transthoracic echocardiogram. A, Apical 4-chamber view with visible needle and thrombus located on the tip of the mitral valve leaflet. B, Apical 4-chamber view, and C, parasternal short axis view. Color Doppler blood flow shows mild/moderate-sized muscular ventricular septum defect (VSD) positioned in the middle third of the interventricular septum (arrows). RA indicates right atrium; for other abbreviations, see Figure 2 legend.
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