Hemolysis After Mitral Valve Repair

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A 54-year-old woman, status post–mitral valve repair for severe mitral regurgitation secondary to mitral valve prolapse, was admitted 7 weeks after surgery with shortness of breath and fatigue. Hematological studies revealed a Coomb’s-negative hemolytic anemia with a hematocrit of 17.1%, haptoglobin of <7.9 mg/dL (normal 51 to 192 mg/dL), LDH of 3165 U/L, total bilirubin of 6.8 mg/dL (indirect of 6.1 mg/dL), and a peripheral blood smear demonstrating mechanical hemolysis with schistocytosis and red cell fragmentation (arrows, Figure, A). A transesophageal echocardiogram revealed partial dehiscence of the mitral valve annuloplasty ring (No. 28 Baxter Physio ring) from the native mitral valve annulus (arrow, B). Color Doppler images demonstrate severe regurgitation with fragmentation of the mitral regurgitation (arrow, C) into a valvular jet and a high-velocity para-ring regurgitant jet. 3D echocardiographic images reveal a paravalvular communication (white arrow, D) created by the dehiscence of the annuloplasty ring from the native mitral valve annulus. 3D color Doppler images (with color suppression of the lower-velocity valvular regurgitation) demonstrates the high-velocity para-ring regurgitant jet (white arrow, E).

Hemolytic anemia is a reported, although uncommon, complication of mitral valve repair. Mechanisms of hemolysis that have been suggested include collision of the regurgitant jet into the prosthetic ring, fragmentation of the regurgitant jet by a dehisced annuloplasty ring, and rapid acceleration of a jet through a small para-ring channel.1,2 The probable mechanism in the present case is fragmentation of the regurgitant jet, with rapid acceleration through the para-ring dehiscence. The patient returned to the operating room for mitral valve replacement, after which the hemolytic anemia resolved.

References
A. Peripheral blood smear revealing schistocytes and red cell fragmentation due to mechanical shearing of red blood cells. B and C, Transverse-plane transesophageal images of mitral valve. B, Partial dehiscence (arrow, B) of annuloplasty ring from native mitral valve annulus. C, Color Doppler imaging reveals fragmentation of regurgitant flow into a valvular and a para-ring regurgitant jet. D, 3D echocardiographic images of mitral valve from LA view demonstrating an area of dehiscence (white arrow) of annuloplasty ring from native mitral valve annulus (black arrows outline medial border of annuloplasty ring). E, Long-axis 3D color Doppler images of mitral valve and posterior LA wall demonstrate a high-velocity regurgitant jet (white arrow) outside annuloplasty ring. Lower-velocity valvular regurgitant jet has been suppressed (black arrow identifies posterior aspect of annuloplasty ring).
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