Unusual Cause of Stroke After Mitral Valve Replacement

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A 78-year-old woman was admitted to the hospital because of ischemic stroke with regressive right hemiplegia. Two years earlier, she had undergone a supra-annular mitral valve replacement with a porcine bioprosthesis (St Jude Medical Epic No. 27, St. Jude Medical, Inc., St. Paul, Minn). Because of paroxysmal atrial fibrillation, she had received vitamin K antagonist treatment since the surgery. At admission, the patient was asymptomatic and had no fever. Physical examination revealed a 2/6 apical diastolic murmur.

Transcatheter echocardiography performed at admission revealed several extensive vibratile masses attached to the prosthesis ring. Mean mitral gradient was 11 mm Hg, which indicated prosthesis obstruction. Maximal systolic pulmonary pressure was 47 mm Hg. Left ventricular ejection fraction was 50% as assessed by the biplane Simpson method. Two- and 3-dimensional transesophageal echocardiography showed that the cusps of the bioprosthesis and left atrial endothelium became covered with tissue overgrowth and confirmed the presence of voluminous vibratile-added masses (the longest component was 19 mm) attached to the prosthesis ring with a protrusive extent onto the prosthetic orifice leading to mitral prosthesis obstruction (Figure 1 and Movies I and II in the online-only Data Supplement).

Carotid ultrasonography revealed no significant lesions. A diagnosis of bioprosthesis obstruction related to thrombosis or infection was suspected. However, the international normalized ratio and C-reactive protein measurements were 2.3 and 5 mg/L, respectively, and hemocultures were negative.

Because of her recent stroke and the presence of voluminous masses leading to prosthesis obstruction, the patient underwent a redo bioprosthesis replacement. Peroperative observations showed the presence of extensive fibrous pannus on the left atrial endothelium and prosthesis cusps, with several mobile components in the prosthetic orifice leading to obstruction of the prosthesis (Figure 2). Pathology examination confirmed the extensive pannus in-growth without thrombus or endocardial damage (Figure 3). Cultures were negative.

Bioprosthetic heart valves undergo tissue deterioration characterized by tissue degeneration, calcifications, cusp tears, and sometimes fibrous pannus. Pannus is composed of fibroblasts and collagen fibers, which reflect tissue reaction at the site of implantation. Some coexisting factors such as the prosthetic valve design, biocompatibility, surgical techniques, prosthetic valve size in cases of smaller annuli, blood flow turbulence, shear stress, inadequate anticoagulation, and sus-

Figure 1. Extensive vibratile masses attached to the bioprosthesis ring and tissue growth covering the cusps of the bioprosthesis and left atrial endothelium on 2-dimensional transesophageal echocardiography.
tained inflammation may contribute to pannus formation. Mitral chord preservation and subannular ring implantation may favor the formation of pannus on mitral bioprostheses by increasing the close proximity and repeated contact of the preserved mitral tissue with the prosthesis ring. However, most of the time, collagen extension remains limited near the ring, and extensive pannus in-growth, especially in the mitral site, is an uncommon cause of valve failure. Bortolotti et al first described 2 cases of Hancock bioprosthetic mitral stenosis caused by tissue overgrowth on the atrial aspect of the cusps 5 and 6 years after implantation. In our case, the discovery of vibratile masses on the prosthesis, combined with the patient’s recent stroke, led us to suspect thrombosis or infection.

To the best of our knowledge, this is the first reported case of cerebral ischemic attack related to an isolated, extensive, protruding pannus on a mitral bioprosthesis with several mobile components and mimicking thrombosis or endocarditis lesions on echocardiography.

Disclosures
None.

References
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