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EDITORIAL COMMENTARY

Atrial thrombosis in advanced mitral stenosis with atrial fibrillation: What should we expect?

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See related article on pages 1970-6.

In this issue of the *Journal of Thoracic and Cardiovascular Surgery*, Luo and colleagues¹ publish their study intended to evaluate the role of left atrial endocardial dysfunction and platelet activation in left atrial thrombosis (LAT). Their study included 80 patients with rheumatic mitral stenosis

(MS) and atrial fibrillation (AF) with (40 patients) or without (40 patients) LAT. They also evaluated the blood of 15 apparently healthy volunteers and 10 specimens of left atrial appendages harvested from donor hearts, looking at the expressions as well as plasma concentrations of von Willebrand factor (vWF) and P-selectin protein. Patients with LAT had bigger left atrial dimensions and smaller valve orifices. Luo and colleagues¹ found no differences in plasma levels of vWF and P-selectin between the left atrium and peripheral blood. They concluded that the over-expression of the vWF gene in the left atrial appendage may contribute to the increase in plasma vWF levels. What is extracted from this contribution is that vWF and P-selectin are supposed to play a collaborative role in thrombosis on the injured endothelium in left atrial appendage.

Rheumatic MS as a sequela of acute rheumatic fever is a still common disease in various parts of the world,² and because it is a chronic inflammatory disease, a number of complex phenomena are observed. Subclinical chronic carditis has been previously confirmed by Chopra and

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associates³ in an elegant study in which 50 samples from the left atrium retrieved at the time of closed mitral commissurotomy demonstrated inflammatory infiltrates and confirmed the predominant presence of T cells. That study improved the understanding of chronic inflammation in this setting.

Some aspects of this contribution¹ should be highlighted. There were differences between left atrial diameter and mitral valve orifice area in patients with MS and LAT and those in patients without LAT and control subjects. Although it is not surprising that the left atrial diameter was larger and the mitral valve orifice area smaller in patients with LAT, this finding and associated AF represent very advanced disease. Histologic examination showed the endocardium to be fibrous in patients with AF and showed LAT to be associated with chronic endocardial scarring.

Furthermore, peripheral plasma levels of vWF and P-selectin were higher in patients with MS and LAT than in patients without LAT and obviously in control subjects, but the same was not true in the LA appendage. Gene expression of P-selectin in LA appendage was not different among groups. vWF influences platelet adhesion onto endocardial collagen. P-selectin is a marker of platelet activation because of its translocation from the platelet granules to the platelet surface when the granules are secreted,⁴ suggesting then that patients with MS have an increased platelet activation that might be more intense in the patients with LAT. Platelet activation is a very complex phenomenon, and it is related to a variety of triggers.⁵ This study partially addresses this issue. Luo and colleagues' findings¹ may explain some of the chronic changes seen in patients with MS with and without LAT. In patients with MS and AF, the development of LAT is a step forward in the disease, which is also related to disturbances in hemodynamics. The smaller the valve orifice area, the more turbulent the intra-atrial flow, including the left atrial appendage where thrombi originate. As Luo and colleagues¹ confirmed, chronic endothelial scar seen on histologic studies and other factors including collagen may play a role in activating platelets.⁵ The biochemical results of this investigation are consistent with an advanced disease that is represented by AF and LAT, with the latter being the ultimate evolution of intra-atrial turbulent flow and

endocardial remodeling. An injured endothelium such as found in MS with AF may lead to modifications in the endocrine and paracrine functions.

This contribution is, of course, of scientific interest, although there are some concerns about practicality. The findings suggest a combination of effects of vWF and P-selectin that contribute to thrombosis on an injured myocardium. This may raise questions about eventual modifications of antithrombotic therapy in patients with MS and AF and whether such a therapy might eventually prevent LAT. It is probably too early for Luo and colleagues to give an answer, and their suggestion that stronger antiplatelet therapy could be beneficial should not be taken lightly. Stronger antiplatelet therapy is a must and may not match the effect of dual antiplatelet therapy. Other clinical studies have suggested that single antiplatelet therapy and not anticoagulation may be effective in preventing thrombotic events on rough surfaces, such as prosthetic valve rings immediately after valve replacement.⁶ The chronically scarred myocardium as shown in this study is a good example of a rough surface that needs pharmacologic intervention. Further investigations on the complex topic of platelet activation and thrombosis in the setting of MS are warranted.

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