


Clinical vignette

The Annexin code: revealing endocarditis

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A 54-year-old woman presented to our hospital after an episode of fever of unknown origin. The fever had occurred 6 weeks prior to presentation and had subsided spontaneously. The patient had no relevant prior medical history. At physical examination, a holosystolic murmur was heard on the apex. Echocardiography showed mitral regurgitation and a mass attached to the mitral valve (Panel A). Multiple blood cultures were taken at the time of admission.

We and other groups have shown the use of radiolabelled Annexin A5 imaging in detection of phosphatidylserine (PS) exposure. Several components in infective endocarditis may result in PS exposure, including activated macrophages, activated platelets, and programmed cell death. Therefore, we hypothesized that Annexin A5 imaging could be of help to image inflammatory activity in the heart.

One day after admission, using a dual isotope technique (thallium and tc99m-Annexin A5), nuclear imaging showed intense Annexin A5 uptake within the left ventricle in the area of the mitral valve (Panel B). Multiple blood cultures were taken at the time of admission.

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One day after admission, using a dual isotope technique (thallium and tc99m-Annexin A5), nuclear imaging showed intense Annexin A5 uptake within the left ventricle in the area of the mitral valve. After 9 days of incubation, blood cultures showed Streptococcus milleri. In spite of adequate antibiotic treatment, patient developed increasing signs of congestive heart failure and was sent for mitral valve replacement 2 weeks after admission. Immunostaining of the valvular tissue showed abundant Annexin A5 binding (Panel B), which co-localized with CD68 positive cells staining, indicative of macrophages. In conclusion, this case suggests that molecular imaging of inflammatory activity using Annexin A5 may help to diagnose infective endocarditis before blood cultures become diagnostic (Panel C).

Panel A. Parasternal long-axis view of the left ventricle. Arrowhead indicates mass attached to the mitral valve. LV, left ventricle; Ao, Aorta.

Panel B. Top panel shows extensive binding of Annexin A5 to cells. Bottom panel shows co-localization with macrophages. Brown, Annexin; blue, macrophage marker (CD68).

Panel C. Dual isotope imaging. Top row: thallium images. Short-axis view of the left ventricle at the level of the mitral valve. Note the absence of thallium uptake in the septal part of the top right image, indicating insertion of the aorta. Bottom row: Annexin images. Arrowhead indicates the uptake of radiolabelled Annexin in the area of the mitral valve. L, liver; S, spleen.