Subvalvular pannus formation causing aortic stenosis in patient with a normal prosthetic aortic valve: computed tomography finding

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A 60-year-old woman was admitted to evaluate the reason of recent cardiac arrest. She had undergone replacement of the aortic valve 17 years earlier (Carbomedics, 21 mm). Echocardiography showed a high-pressure gradient across the valve with interval progression during 2 years (mean gradient from 42 to 49 mmHg). Fluoroscopy showed normal leaflet movement (see Supplementary data online, Video S1). Although pannus formation was suspected, the exact etiology could not be identified. Cardiac computed tomography (CT) revealed a crescent-shaped low-density tissue growth, suggesting pannus formation, near the suture ring of subvalvular area (Panels A and B). Three-dimensional CT, simulated surgical field, also demonstrated ring-like pannus formation in the subvalvular area (Panel C). In the surgical field, removal of the prosthesis revealed a circumferential fibrotic pannus (Panel D) that reduced the effective orifice area. The size and shape of the pannus were exactly correlated with those illustrated by the CT. Although smaller size of the valve was implemented (Sorin, 18 mm), postoperative echocardiography showed a marked decrease in pressure gradient (12 mmHg). Even though pannus growth did not involve the hinge point, effective orifice area of the prosthetic valve can be significantly decreased if pannus overgrowth obstructs blood flow through the valve orifice. CT can also detect and differentiate other causes of valve dysfunction such as thrombus or calcification. In previous reports, thrombus showed lobular or amorphous shape and a lower CT attenuation value than pannus. Although echocardiography is still considered as a standard method for diagnosis of prosthetic valvular dysfunction, subvalvular area may be a blind spot of echocardiography due to acoustic shadowing. In that case, CT could depict morphological alteration of subvalvular area as well as the prosthetic valve itself, and may contribute to appropriate surgical decision-making.

AO, ascending aorta; LV, left ventricle; PA, pulmonary artery; LA, left atrium; LCA, left coronary artery; RCA, right coronary artery.

Funding: This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Science, ICT & Future Planning (NRF-2013R1A1A058711).

Supplementary data are available at European Heart Journal – Cardiovascular Imaging online.