Abstract: **1643**

**A challenging diagnosis in prosthetic mitral valve obstruction**

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**Topic(s):**
Imaging: Valve Disease

**Citation:**
A 53-year-old man was referred to our center for a prosthetic mitral valve obstruction. In December 2017 the patient had a myocardial infarction complicated by papillary muscle rupture and anterior leaflet flail; therefore he underwent a mechanical mitral valve replacement (size 29).

A first echocardiographic control in August 2018 was reported as normal. In February 2019 a further echocardiography showed an increase of the trans-prosthetic pressure gradients and a suspected restricted motion of the anterior tilting disk; a cinefluoroscopy view confirmed the tilting disk blockade in the closing position.

The patient was referred to our center for further investigations. We performed a 3D TOE that confirmed the prosthesis dysfunction: the anterior tilting disk was blocked (mean gradient 14 mmHg, 3D residual anatomical area 1.4 cm²); the mechanical cause of the obstruction was not identified. A cardiac CT was performed: a clear thrombus or pannus was not visualized, even if a linear hypodensity could be seen along the inner circumferential edge of the blocked disk.

Finally the patient underwent the surgical intervention for prosthesis replacement. The visual analysis of the valve revealed a stratified thrombosis in both the atrial and ventricular side of the blocked disk, extending to the prosthetic ring and to the hinges.

The patient developed a prosthetic valve dysfunction 9 to 13 months after valve replacement. Thrombus is the most common cause of obstruction of mechanical prostheses (0.3 to 8% per patient-year) while pannus formation usually occur over 5 years after surgery (minimum 12 months later). On the one hand, the patient assured a good anticoagulation regimen in the previous months, thrombosis in mitral valve position usually present with a large formation involving the disk projecting into left atrium, and large prosthesis size is associated with a lower risk of thrombosis.

Our TOE confirmed the hemodynamic dysfunction but was not able to detect any cause of the leaflet blockade. Cardiac CT has a better spatial resolution but only a focused MPR view allowed to identify a linear hypodense formation along the ring surrounding the blocked disk. This thin structure only involved the prosthetic ring, apparently not projecting over the disk. These morphologic features are considered more in keeping with pannus, and only the low attenuation values (below the suggested threshold of 200 HU) helped to suspect a thrombotic stratification over the prosthetic ring.

The surgical intervention revealed the real nature of the obstruction.

In conclusion, thrombus may present with an unconventional appearance as a cause of prosthetic obstruction and, especially when stratified can mimick a pannus. Multimodality imaging is not always able to identify the cause of mechanical valve dysfunction; consequently, when the prosthesis obstruction is evident but imaging is inconclusive cardiac surgery is the only diagnostic and therapeutic resource.
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Figure 1. Top: CT view of the prosthetic valve: red star shows a hypodense region in the inner edge of the prosthetic valve ring; in the inner edge of the prosthetic valve ring = 100 HU if compared to the correspondent region of the opposite tilting disk = 422 HU (blue star). Bottom-left: prosthetic valve at TEE. Bottom-right: prosthetic valve after explant showing an extended stratified thrombus in the atrial side of the tilting disk.