Rheumatic Heart Disease
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Clinical History
A 30-year-old woman, who was born and raised in Asia, presented with worsening dyspnea, hemoptysis and decrease in exercise tolerance. Her past medical history was remarkable for rheumatic valvular heart disease and decompensated heart failure during her first pregnancy at the age of 21. She underwent percutaneous mitral balloon valvuloplasty (PMV) 8 years prior to the most recent presentation, with a second uneventful pregnancy following that procedure.

A transthoracic echocardiography (TTE) revealed moderate-to-severe mitral stenosis (MS) with a valve area of 1.2 cm$^2$, severe aortic stenosis with moderate aortic regurgitation (valve area 0.7 cm$^2$), and moderate pulmonary hypertension (50 mmHg). The patient was not a candidate for repeat balloon valvuloplasty, and surgery was recommended. A chest X-ray and a cardiac CTA were requested as part of the pre-surgical work-up.

Findings
A chest X-ray showed prominence and cephalization (redistribution) of pulmonary vasculature and a right cardiac “double contour” sign (left atrial enlargement) (Figure 1). Cardiac CTA in diastole showed normal coronary arteries with no luminal stenosis (Figure 2), dilatation of the main pulmonary artery, and a thickened mitral valve that showed spotty calcification (Figure 3), and had a fish-mouth appearance (Figure 4) and an opening area of 1.2 cm$^2$ by planimetry, which correlated with the TTE-derived valve area. The aortic valve was also thickened (Figure 3).

Discussion
Due to evolving immigration trends, MS is once again been encountered with increasing frequency in the developed world. Persistent inflammatory valve damage and hemodynamic injury are the main contributors to gradual progression of the disease. The main anatomic abnormalities are leaflet thickening, nodularity, calcification and commissural fusion, all of which eventually result in narrowing of the valve orifice. Most patients are symptomatic when the mitral valve area approaches 1.5 cm$^2$ (normally 4-6 cm$^2$), and when the aortic valve area is below 1 cm$^2$.

Cardiac CT angiography has been shown to safely exclude obstructive coronary atherosclerosis prior to cardiac surgery. Moreover, it is also able to provide imaging of valve anatomy. For these reasons it should be considered in patients with low-intermediate pre-test probability of coronary artery disease, who are scheduled to undergo cardiac surgery. This patient underwent surgery for replacement of her mitral and aortic valves, and her post-operative course was uneventful.

REFERENCES