A 34-year-old man was referred to our hospital for cardiac diastolic murmur revealed by dyspnea and palpitations; transthoracic and transesophageal echocardiography showed severe aortic regurgitation (A and B, Online Videos 1 and 2) and suggested wall thickening of the ascending aorta. Cardiac computed tomography confirmed circumferential aortic wall thickening (8 mm) (C, arrows), partly calcified and resulting in aorta lumen narrowing (16 mm) (D, Online Video 3, virtual navigation in the proximal aorta). The right cusp of the aortic valve was stuck by its tip to the wall (E, arrow) causing a large closing defect in diastole (F, arrow). Extension to the right coronary ostium caused occlusive stenosis demonstrated on 3-dimensional volume rendering (G, arrow; Online Video 4) and curvilinear (H, arrow) analyses. Syphilitic serologies TPHA+VDRL were highly positive, and after 3 weeks of penicillin treatment, surgical replacement of the ascending aorta and aortic valve with bypass graft to the right coronary artery were performed; operative findings (I, arrow) and pathological findings (J, K, and L) were consistent with aortic wall thickening by syphilitic inflammatory gummas.