A 45-year-old man presented with swelling on the right side of the chest that he had had for the previous 3 months. Examination revealed pulsatile swelling in the right infraclavicular area (Panels A and B, and Video). Cardiac examination was normal. Radiography of the chest showed mediastinal widening. An echocardiogram revealed mild aortic regurgitation with an aneurysm of the ascending aorta. Computed tomography of the chest with the use of contrast material showed a large saccular aneurysm (9.2 cm × 11.3 cm × 5.8 cm) (Panel C, asterisks in images, from left to right, of the right anterior oblique view, the anteroposterior view, and the left anterior oblique view) arising from the right anterolateral wall of the distal ascending aorta. The aneurysm was eroding the right half of the manubrium of sternum and the adjacent first and second costochondral junctions. Compression of the trachea, pulmonary artery, superior vena cava, and esophagus was noted. The patient had a history of untreated syphilis. Tertiary syphilis was confirmed by means of a positive Venereal Disease Research Laboratory test and Treponema pallidum hemagglutination assay. The patient underwent successful valve-sparing resection after penicillin G therapy. Pathological findings were consistent with syphilitic aortitis, an infrequent condition in which spirochetal invasion of the adventitia causes an obliterative endarteritis of the vasa vasorum. Impaired blood supply to the aortic wall results in the weakening of the tunica media and in aneurysm formation.