Cardiovascular Complications of Cutis Laxa Syndrome

Successful Diagnosis and Surgical Management

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Cutis laxa syndrome is a rare inherited connective tissue disorder characterized by inelastic loose hanging skin, which gives the appearance of premature aging. Histology shows degenerative changes in the elastic fibers of the connective tissue throughout the body. Severe aortic dilatation may occur because of medial elastic fiber degeneration.

We report the case of a 27-year-old man with a confirmed diagnosis of cutis laxa syndrome. The patient, of Albanian ethnic origin, had no family history of the disease and no consanguinity between parents. All siblings, 4 brothers and 3 sisters, are well and free of disease. He was asymptomatic, but because of his loose facial skin and senile appearance (Figure 1), he consulted a dermatologist concerning having plastic surgery on his face, which he subsequently had performed. The dermatologist suspected cutis laxa and referred him for a full assessment of his condition.

His ECG showed sinus rhythm with no rhythm or conduction disturbance. Chest x-ray (Figure 2A) showed abnormalities of the contours of upper right border of the heart. Echocardiography (Figure 2B and 2C) revealed an aneurysm of the right coronary sinus of Valsalva that measured 8.4 cm in diameter, associated with severe aortic regurgitation and a dilated left ventricle with dynamic systolic function.

Cardiovascular magnetic resonance (Figure 2D, 2E, and 2F) showed a large right coronary sinus aneurysm (72 mm × 75 mm) and a smaller noncoronary sinus aneurysm (32 mm × 35 mm). The left coronary sinus was normal in appearance and dimensions. The thoracic aorta had normal dimensions distal to the sinotubular junction with no evidence of dissection. There was severe central aortic regurgitation (regurgitant fraction 44%). The left ventricle was dilated, with normal systolic function.

Cardiac computed tomography (Figure 2G, 2H, and 2I) confirmed a large right coronary sinus aneurysm, measuring 8.2 cm in diameter. The right coronary artery looked patent, although it was markedly attenuated from its origin as it was stretched over the surface of the right coronary sinus; the left anterior descending coronary artery was normal.

The patient was then referred urgently for resection of the right coronary sinus aneurysm, coronary reimplantation, and aortic valve replacement. At surgery, the right coronary artery, which was stretched over the aneurysm, was occluded proximally. It was subsequently reimplanted into the new aortic root with resection of the occluded segment. The aortic valve leaflets were stretched, but otherwise normal. The

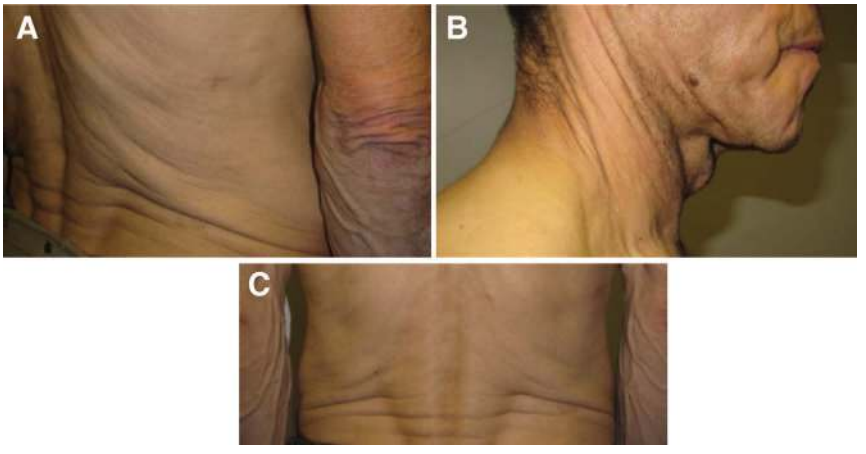

Figure 1. Physical appearance of the patient. Aged appearance with wrinkly skin on the dorsal aspect of the arms (**A**), neck (**B**), and back (**C**).

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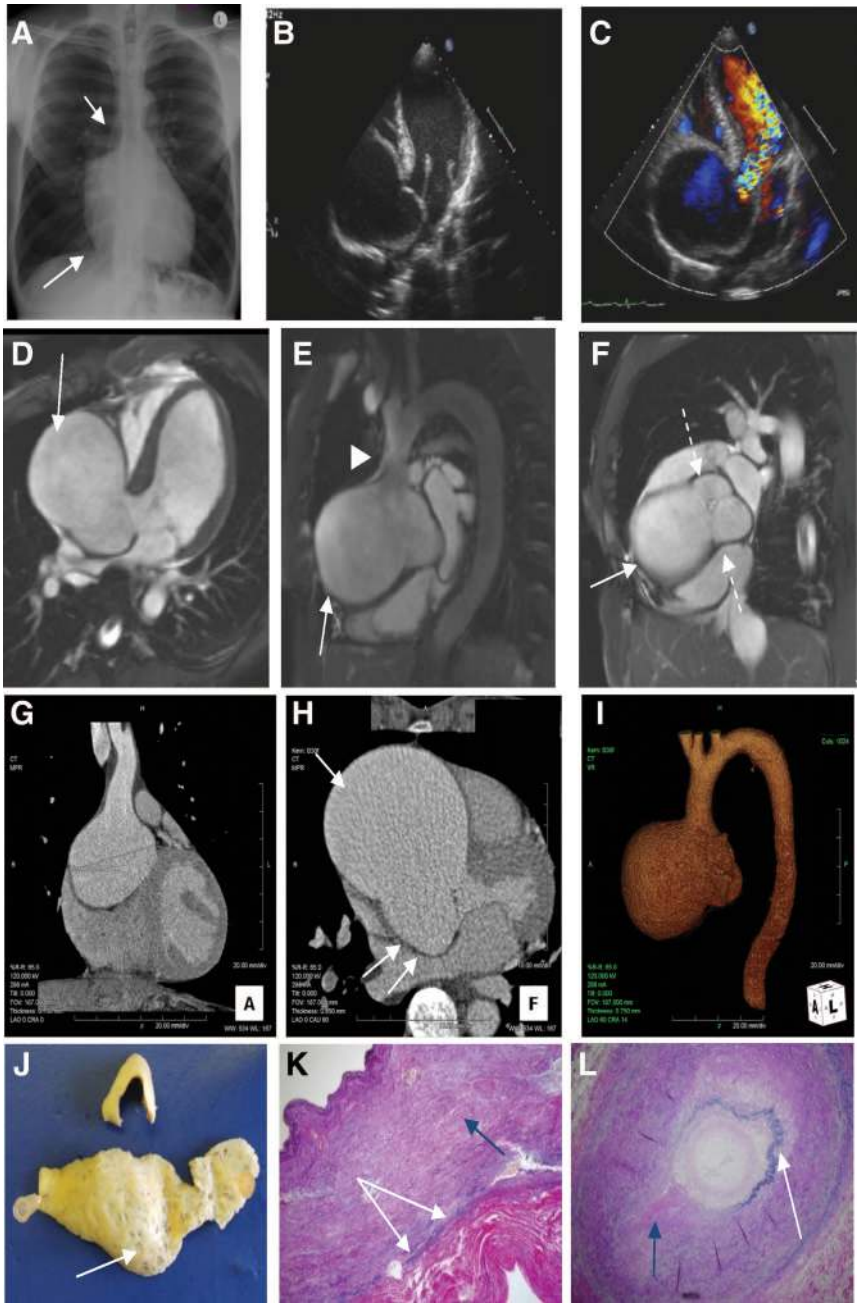

Figure 2. (**A**) Chest x-ray. Abnormal contour of upper right border due to a huge aneurysm of the right sinus of Valsalva. (**B** and **C**) Transthoracic echocardiography. Apical 4-chamber views revealing a large aneurysm of the right sinus of Valsalva. (**D**, **E**, and **F**) Cardiovascular magnetic resonance scan. Steady-state free precession magnetic resonance images showing a large aneurysm of the right sinus of Valsalva (arrow), but normal ascending aorta (arrowhead). (**G**) Coronal reconstruction of computed tomography scan shows the dilated right sinus of Valsalva. (**H**) Computed tomography scan: transaxial section shows the aneurysm of the right sinus of Valsalva (1 arrow) and the noncoronary sinus (2 arrows). (**I**) Volume-rendered reconstruction of thoracic aorta demonstrating the sinuses of Valsalva and aneurysm.(**J** through **L**) Histopathology. (**J**) Intimal aspect of aneurysm showing depressions in the intimal surface. (**K**) Cross section of the aneurysm showing destruction of the elastin layers (white arrows) and replacement by collagen (blue arrow), Elastin Van Gieson stain. (**L**) Transection of the right coronary artery showing total occlusion by foamy macrophages and fibroblastic proliferation. Note the destruction of the internal elastic lamina (white arrow), with increase in medial collagen (blue arrow), Elastin Van Gieson stain.

patient underwent an aortic valve replacement with a 29-mm Freestyle (Medtronic) stentless porcine valve prosthesis, followed by reimplantation of the coronary arteries. The postoperative course was uneventful.

Histology (Figure 2J, 2K, and 2L) of the resected aneurysm showed cystic medial degeneration of the aorta with extensive intimal fibrosis and destruction of the medial elastic layers with replacement by fibrous tissue. There was no inflammation to indicate an aortitis. There was intimal narrowing of the right coronary artery with critical stenosis due to intimal proliferation composed of foamy macrophages and fibromuscular connective tissue.

The disease is inherited most commonly in a severe autosomal recessive form, or as a relatively benign, autosomal dominant form. There is often systemic organ involvement in patients with the autosomal recessive form. Cardiopulmonary abnormalities are common and are the principal determinant of prognosis and life expectancy.

Pulmonary emphysema, cor pulmonale, and right-sided heart failure generally caused by pulmonary disease are often seen in infancy. Various other cardiovascular abnormalities, including aortic aneurysm and pulmonary artery branch stenoses, have been reported.

To our knowledge, this is the first case reported in the literature with successful treatment of a sinus of Valsalva aneurysm in cutis laxa syndrome associated with narrowing of the right coronary artery. This case illustrates the severity of cardiovascular complications with aortic wall disease in this presentation. In such instances, early referral for surgery would be appropriate to avoid aortic dissection or rupture.

Given the incidence and importance of cardiovascular complications, as soon as the diagnosis of cutis laxa is made, regular cardiovascular follow-up is warranted.

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Disclosures

None.