G79 Acute Dissection of the Left Subclavian Artery in a Patient With Ehlers-Danlos Syndrome

Cristin M. Rolf, MD, University of Kentucky/Office of the Associate Chief Medical Examiner, Commonwealth of Kentucky, 100 Sower Boulevard, Suite 202, Frankfort, KY 40601-8272*

After attending this presentation, attendees will have reviewed of pathogenesis, complications, and the methods for the diagnosis of EDS as a cause of sudden death.

The presentation will help one recognize this unusual cause of internal hemorrhage, and will emphasize the need for communication with families about the genetic implications of EDS.

This presentation consists of a case study of a female who died from complications of Ehlers-Danlos Syndrome Type IV and includes a discussion of the pathogenesis, complications and diagnostic workup of Ehlers-Danlos syndrome with emphasis on EDS Type IV, the vascular type.

EDS is a heterogeneous group of connective tissue disorders characterized by the inability to produce sufficient amounts of collagen or by a defect in the structure of collagen. At least 10 variants of EDS have variable modes of inheritance. This paper reviews the syndrome as a whole but will emphasize the vascular type, or EDS Type IV. Affected patients usually have hyperextensible skin and hypermobile joints, hence the designation “rubber man.” Patients have a predisposition for joint dislocations and fragility of the skin and soft tissues. The most serious complications include rupture of a viscus, or vascular rupture or dissection. Death may result from internal hemorrhage. Diagnosis is based upon physical and laboratory examination of a living patient or autopsy findings. The specific collagen defect can be elucidated through electrophoresis of collagen products produced by a fibroblast culture of the patient’s skin, soft tissue or organs. DNA molecular studies of the fibroblast culture pinpoint the gene locus mutation.

A 33-year-old white female was admitted in asystole to an emergency department after awaking suddenly during the night stating that she “was passing out.” Despite ACLS protocol she could not be resuscitated. She had been admitted to the hospital earlier that week with headache and gastrointestinal symptoms including nausea, vomiting and abdominal pain. Endoscopy revealed gastritis, chronic enteritis of the duodenum, and the colon grossly was significant for a small cluster of dark red polyps clinically suspicious for juvenile polyps or hamartoma. She was also found to have a microcytic hypochromic anemia. Treatment included red blood transfusion. Preliminary autopsy findings included thin, transparent skin of the trunk and extremities revealing the subcutaneous vasculature. Internal findings included unusual friability of vasculature, soft tissue, and viscera. The organs were extremely soft, and the skin tore upon restoration of the body after autopsy. The embalmers reported severe friability of the vasculature and difficulty in the embalming procedure. Grossly there was a dissection of the left subclavian artery with adventitial hemorrhage, which extended from its origin at the aorta to 10 cm distal in the upper arm. Significant sequelae included a left hemothorax of 1,050 ml and visceral pallor. Microscopic sections of the vessels revealed a dissection of the outer third of the muscle wall of the left subclavian artery and the left renal artery. Thrombus and rupture of the vascular wall involved the mesenteric arteries of the transverse colon with subsequent segmental early necrosis of the colon. Samples of lung, skin and kidney underwent fibroblast culture. Electrophoretic mobilities of collagen produced by cultured fibroblasts revealed diminished type III procollagen and intracellular storage of abnormal type III procollagen. cDNA responsible for encoding pro alpha 1 (III) chains of the type III procollagen was synthesized from RNA isolated from the patient’s fibroblast culture. Normal c DNA and an abnormal cDNA that demonstrated a mutation of the gene COL3A1 were present. The mutation was a change in the second nucleotide of intron 14 (IVS14 + 2T->A). There was no family history of adverse vascular events. The final diagnosis in this case is left hemothorax due to dissection with rupture of the left subclavian artery due to Ehler’s Danlos syndrome type IV.

Ehler’s Danlos syndrome is an entity to be included in the differential diagnosis of sudden death in a patient with internal hemorrhage cause by spontaneous vascular rupture or dissection. The implications to the patient’s family are serious, and genetic counseling follow up is required.

Ehlers-Danlos Syndrome, Arterial Dissection, Hemothorax

 ** Presenting Author*