H53 Cardiac Amyloidosis—Two Cases

Stephen Peltier, BS, Kalamazoo, MI 49004; Juliana Molosky*, Kalamazoo, MI 49004; Theodore T. Brown, MD, Kalamazoo, MI 49008; Joseph A. Prahlow, MD, Western Michigan University School of Medicine, Kalamazoo, MI 49007*

Learning Overview: After attending this presentation, attendees will better understand the genetic and pathologic differences between various forms of cardiac amyloidosis.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by highlighting two cases of cardiac amyloidosis that were diagnosed at autopsy.

Reported here are two cases of death caused by amyloidosis with cardiac involvement. One case involved a 71-year-old Vietnamese woman. Autopsy revealed severe cardiac interstitial fibrosis/amyloidosis, with associated cardiomegaly (470 grams), as well as focal, microscopic amyloidosis within the stomach, liver, and kidney. Mass spectrometry of cardiac tissue was consistent with transthyretin-type amyloid deposition. Transthyretin sequencing expressed a mutation (Ala97Ser) indicative of hereditary transthyretin amyloidosis.

The second case involved a 77-year-old male with a past medical history most significant for congestive heart failure and clinical work-up concerning amyloidosis. Autopsy revealed diffuse cardiac amyloidosis, with associated cardiomegaly (830 grams), dilated heart, and biventricular hypertrophy, as well microscopic amyloidosis within the liver and kidneys.

Heart disease is the most common cause of death in the United States, with the majority of cases attributable to ischemic and hypertensive heart disease. More rare are the infiltrative cardiomyopathies, which includes amyloidosis.[1] Cardiac amyloidosis may be cardiac-limited or have associated extracardiac involvement, and is nearly always caused by one of two proteins: immunoglobulin light-chain or transthyretin.[2]

Amyloid Light-chain (AL) amyloidosis is the most common type of pathologic cardiac amyloidosis and usually occurs in the setting of plasma cell dyscrasias.[3] Amyloid Transthyretin (ATTR) amyloidosis can be due to wild-type or mutated (hereditary) transthyretin. Wild-type ATTR (previously senile) amyloidosis is the second most common cause of cardiac amyloidosis and occurs mostly in elderly men. Hereditary ATTR amyloidosis is less common, presents at a younger age, and has various geographic distributions.[4] Mortality from cardiac amyloidosis is often due to heart failure or fatal arrhythmias.[5]

The cases serve to highlight cardiac amyloidosis in the forensic autopsy setting. Forensic pathologists need to be aware of the various forms of cardiac amyloidosis and the types of postmortem testing available to better characterize the diagnosis. Depending on the type of amyloidosis, notification of surviving family members may be appropriate, as some cases have a familial tendency.

Reference(s):

1. Ziaeian, Boback and Gregg C. Fonarow. Epidemiology and aetiology of heart failure. *Nature Reviews Cardiology* 13, no. 6 (2016): 368.
2. Siddiqi, Omar K. and Frederick L. Ruberg. Cardiac amyloidosis: an update on pathophysiology, diagnosis, and treatment. *Trends in Cardiovascular Medicine* 28, no. 1 (2018): 10-21.
3. Merlini, Giampaolo and Vittorio Bellotti. Molecular mechanisms of amyloidosis. *New England Journal of Medicine* 349, no. 6 (2003): 583-596.
4. Gertz, Morie A., Merrill D. Benson, Peter J. Dyck, Martha Grogan, Terresa Coelho, Marcia Cruz, John L. Berk, Violaine Plante-Bordeneuve, Hartmut H.J. Schmidt, and Giampaolo Merlini. Diagnosis, prognosis, and therapy of transthyretin amyloidosis. *Journal of the American College of Cardiology* 66, no. 21 (2015): 2451-2466.
5. Kristen, Arnt V., Thomas J. Dengler, Ute Hegenbart, Stefan O. Schonland, Hartmut Goldschmidt, Falk-Udo Sack, Frederik Voss, Rüdiger Becker, Hugo A. Katus, and Alexander Bauer. Prophylactic implantation of cardioverter-defibrillator in patients with severe cardiac amyloidosis and high risk for sudden cardiac death. *Heart Rhythm* 5, no. 2 (2008): 235-240.

Cardiac Amyloidosis, Infiltrative Cardiomyopathy, Transthyretin

Copyright 2020 by the AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by the AAFS.

*Presenting Author