



### H138 A Cold Bone Heart: A Rare Case of Death Due to Acute Myocarditis in a Subject Suffering From Chronic Constrictive Pericarditis

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**Learning Overview:** The goal of this presentation is provide a suitable methodological approach to cardiac-related death due to suspected myocarditis occurring in subjects suffering from chronic constrictive pericarditis instrumentally ascertained. This study focuses on macroscopic and histological findings used to reach the diagnosis of the cause of death, with particular regard to the immunohistochemical assessment.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by showing the methodological approach employed in rare cases of fatal acute myocarditis in subjects with diagnosed chronic constrictive pericarditis and the importance of conducting an exhaustive immunohistochemical study with CD45, CD3, CD4, CD8, CD20, CD15, and CD68 antibodies in order to obtain a reliable postmortem diagnosis of myocarditis.

Myocarditis may present with a wide range of symptoms, ranging from mild dyspnea or chest pain, resolving without specific therapy, to cardiogenic shock and death. The onset of acute myocarditis in a substrate of patients with pre-existing chronic constrictive pericarditis is a sporadic occurrence.

A 48-year-old man with a history of chronic constrictive pericarditis of unknown etiology presented to his family doctor with respiratory difficulties, asthenia, and fever with shivering. The doctor prescribed antibiotic therapy, recommending a second evaluation after a few days. However, the day after, the patient was taken to the hospital due to a sudden drop in blood pressure. Electrocardiogram showed diffuse ST elevation, while laboratory tests showed increased levels of cardiac necrosis markers. Echocardiogram revealed the presence of a hyperechoic calcific pericardial formation that circumferentially enveloped the heart, as well as ventricular hypertrophy with a deficit in lateral kinetics and an ejection fraction of 30%. Cardiac ventriculography confirmed the circumferential pericardial calcifications, while coronary angiography revealed no arterial stenoses. Notwithstanding the diagnostic efforts of the physicians, the patient died the following day of unclear causes. Following a complaint of medical malpractice to the judicial authority, a complete autopsy was performed.

At autopsy, gross examination of the heart revealed it to be encased by a fibrocalcific rind, thus confirming the clinical history of chronic constrictive pericarditis. Moreover, the heart had increased dimensions with dilated ventricular chambers and increased parietal pericardial thickness. The coronary arteries were essentially unremarkable without stenosis. Examination of remaining organs was unremarkable. Hematoxylin-Eosin (H&E) -stained histologic sections highlighted a polyvisceral stasis, as well as the presence (in the cardiac samples) of marked fibrotic thickening of the pericardial leaflets with areas of infiltration of white cells. These white cells were also present in the myocardium, disrupting the myocardial architecture. Multiple foci of Contraction Band Necrosis (CBN) involving the sub-endocardial layers were found. To better characterize the myocardial cellular infiltrates, an immunohistochemical evaluation was performed using antibodies against leukocytes (CD45), the main leukocyte subpopulations (i.e., CD3, CD4, CD8, CD20, CD15), and macrophages (CD68). The cellular infiltrate demonstrated strong positivity for CD45 (+++), moderate positivity for CD68 (++), mild positivity for CD8 (+), and negativity for the remaining markers.

Given these results, according to the Dallas criteria, the patient's death was attributed to massive acute myocarditis arising in the setting of chronic constrictive pericarditis. Given the rapidity of the clinical course, the prosecutor determined no malpractice on the part of the physicians; indeed, they had performed multiple diagnostic tests and provided the correct supportive therapy as indicated by the most authoritative literature on the subject.

#### Acute Myocarditis, Chronic Constrictive Pericarditis, Immunohistochemistry