



## Pathology/Biology Section - 2014

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### **G117 Envenomation and Degranulation: A Case Report of Sudden Death Following Copperhead Snakebite and Evaluation of Toluidine Blue as a Diagnostic Tool in the Diagnosis of Kounis Syndrome**

Victoria Sorokin, MD\*, 1885 Old Spanish Trail, Houston, TX 77054; and Merrill O. Hines III, MD, 1885 Old Spanish Trail, Houston, TX 77054

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After attending this presentation, attendees will be able to recognize the association of allergic phenomena with angina and myocardial infarction and be able to use a simple and inexpensive histologic technique to assist in postmortem diagnosis of Kounis syndrome.

This platform presentation will impact the forensic science community by increasing awareness of Kounis syndrome and providing information about a simple and inexpensive histochemical staining technique for use in the diagnosis of Kounis syndrome.

The association between acute coronary events and acute allergic reactions has been recognized for several years. The syndromes of allergic angina and allergic myocardial infarction, currently known as Kounis syndrome, is a rare condition first described in 1991. Recently, this syndrome has been linked to a wide variety of medical conditions including environmental exposures such as envenomations, medication exposures such as antibiotic administration in allergic patients, drug-eluted stent thrombosis, and coronary allograft vasculopathy. The presence of degranulated mast cells in the cardiac tissue along with elevated serum levels of histamine and tryptase is characteristic for this syndrome.

This study presents a case of a 49-year-old man with hypertensive cardiovascular disease who died immediately after being bitten by a copperhead snake (*Agkistrodon contortrix*). Histological sections of the myocardium revealed the presence of large numbers of degranulating mast cells in addition to the histopathologic changes characteristic of hypertensive cardiovascular disease. The presence of degranulating mast cells was confirmed by toluidine blue staining. The temporal relationship of the snake bite and sudden death of the decedent in addition to the histopathologic findings of degranulating mast cells in the myocardium are highly suggestive of a diagnosis of Kounis syndrome.

A study is being conducted using toluidine blue staining of heart sections of age-matched controls without a history of antecedent environmental exposure or evidence of an immune mediated response to assess the utility of toluidine blue staining as an adjunct in the histologic detection and quantification of degranulating mast cells in the myocardium and the specificity of those findings in allergic angina and allergic myocardial infarction.

This research suggests using toluidine blue stain as a readily available and inexpensive adjunct in the diagnosis of allergic angina and allergic myocardial infarction in decedents.

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#### **Kounis Syndrome, Snakebite, Mast cells**