



## Pathology/Biology Section - 2015

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### H143 Homicide by Stroke: Cholesterol Embolus Induced During a Struggle

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After attending this presentation, attendees will recognize stroke from atheroembolus (cholesterol embolus) as a potential result of blunt trauma during the course of an altercation, as well as the spectrum of natural disease processes that may be precipitated in a homicidal manner.

This presentation will impact the forensic science community by raising awareness of the possibility of stroke by atheroembolus resulting from blunt trauma received during the course of a homicide. As this is the first such report of homicide by stroke due to atheroembolus, it is most likely an under-recognized entity.

Death from natural diseases precipitated by homicidal acts is uncommon, but well documented in the forensic literature. "Homicide by heart attack" was reviewed in recent years by Turner et al.<sup>1</sup> The situation is made difficult by circumstances in which no physical contact occurs between perpetrator and victim but nevertheless involve fatal arrhythmia induced by emotional or physical stressors. Criteria are available for such circumstances. Similar situations may involve physical contact that by itself is non-lethal but still results in sudden cardiac death. Revised criteria are available for these situations as well. In each case, severe underlying heart disease is present in addition to sublethal injuries. This is the first case of homicide by atheroembolus reported in the literature. The decedent was a 62-year-old Caucasian woman who was found incoherent at home. She was transported to the hospital and expired shortly thereafter. The investigation revealed that an altercation took place between the decedent and a man, possibly involving a head-lock maneuver. The autopsy revealed an obese woman with moderate calcific atherosclerosis involving the coronary arteries, aorta, and major branches. Brain examination revealed calcific atherosclerosis involving the Circle of Willis with a clot in the right middle cerebral artery, and an acute ischemic infarct involving all of the right middle cerebral artery territory, with transtentorial herniation and secondary brainstem (Duret) hemorrhages. Sections of the right middle cerebral artery revealed a large cholesterol embolus.

In conclusion, this is the first case report of a cholesterol embolus becoming dislodged during the course of an altercation, which resulted in a large right hemispheric stroke with mass effect and death. Extrapolating from criteria associated with sudden cardiac death and non-lethal injuries, the manner of death in this case is compatible with homicide. Given the frequency of atherosclerosis and the possibility of cholesterol emboli with trauma, careful examination of the Circle of Willis should be performed, especially in cases in which the victim suffers acute neurologic decompensation following an altercation.

#### Reference:

1. Turner SA, Barnard JJ, Spotswood SD, Prahlow JA. "Homicide by heart attack" revisited. *J Forensic Sci.* 2004 May;49(3):598-600.

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#### Atheroembolus, Cholesterol Embolus, Stroke