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Can Sudden Cardiac Death be Murder?

A problem faced by police, medical examiners, and prosecutors is the course of action to be pursued when a criminal act results in emotionally precipitated death in the absence of physical injury or contact. The determination of proximate causation may be difficult if there is no autopsy evidence of life-threatening physical trauma nor any historical evidence of physical contact between the victim and the assailant. The usual circumstance is a robbery or burglary during which, or shortly after, a victim collapses. The victim is usually found to be suffering from severe coronary atherosclerosis and its complications.

The approach to such a problem is twofold: legal and medical. Obviously, if the courts refuse to consider such a circumstance as homicide, there would be no point for further discussion. Alternatively, should the courts be willing to accept the premise that a charge of homicide can be made, there should be sufficient medical evidence to sustain a charge. What medical criteria exist to render an expert medical opinion sufficient to meet the test of proof beyond reasonable doubt? In a search for the answer, it is necessary to review the body of case law concerned with the subject. Case experience of medical examiners and the pathophysiology of emotion-precipitated sudden death also need review.

Coincidentally, two simultaneous studies were being done on this subject, one by the author and one by Captain Frank T. Flannery, formerly of the Armed Forces Institute of Pathology.[2] Flannery's study reviews the legal precedents pertaining to homicide by means of fright or emotional stress. His report cites the major precedent-setting cases of homicide resulting from such stress. He includes cases where physical contact was made as well as those where there was no contact. Legal citations cover from 1862 to 1974, an indication that convictions arising from such circumstances are not just newly appreciated. It is quite clear, however, that early courts were reluctant to ascribe a criminal causation of death in the absence of significant physical injury. This is easily understood when one realizes that current knowledge of pathophysiology of sudden natural death is largely a product of post-World War II medical research.

My study is concerned with medical criteria upon which such a homicide charge might be sustained. A query form was prepared by using four situations synthesized from true cases known to the author. Three of these situations involved no actual touching of the victim, but the fourth included the fact that the victim was physically bound by armed robbers. The case situations are as follows:

1. An elderly white female with a past history of stroke and heart disease heard burglars breaking the window glass. While attempting to awaken her elderly sister by throwing pillows across the room to the other bed, she suffered a fatal heart attack and died on the

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scene. Two subjects were apprehended in the act of the attempted break-in. The autopsy disclosed severe occlusive coronary arteriosclerosis and evidence of previous myocardial infarctions as well as an old cerebral ischemic infarct.

2. An elderly female and her adult daughter were confronted by a burglar who had gained entrance to the house. The mother had had a history of heart disease dating back a decade. The burglar struggled with the daughter. He then escaped with the daughter in pursuit. The mother called the police. The daughter returned in a few moments and the police arrived. While talking to the police, the mother suddenly collapsed. At autopsy she was found to have occlusive coronary arteriosclerosis and myocardial fibrosis associated with an old recanalized thrombus.

3. The uncle of a police homicide detective, a 56-year-old male with known heart disease, was abducted by armed robbers who made him drive his vehicle as the getaway car. They drove 3 km (2 miles), where the robbers left the vehicle. The victim drove 5 km (3 miles) to the police station and suddenly collapsed while giving his story to the police. At autopsy he had an old myocardial infarct scar with severe occlusive coronary arteriosclerosis.

4. During a home burglary robbers tied the wife and the husband. The wife pleaded with the robbers not to touch the husband because he had serious heart disease. The robbers left and the wife struggled free from her bonds. While she was untying her husband, he suddenly gasped and died. At autopsy he was found to have an old myocardial infarct scar and severe occlusive coronary arteriosclerosis.

These examples were sent to 50 members of the Pathology-Biology Section of the American Academy of Forensic Sciences to represent a sampling of the major population of the United States. Thirty-nine replies were received from 29 states and one Canadian Province.[3] Although most respondents acknowledged that such events could occur, only five cases were noted during the past 15 years where a conviction of homicide had been obtained in the absence of physical contact between the assailant and the victim. All involved armed robberies. In only one case was there physical exertion, which consisted of running to the police immediately after the robbery. Several other replies indicated similar circumstances where the assailant was never caught. Several other cases were submitted but these involved physical contact.

It is well recognized that physical battery, albeit nonlethal and relatively slight, may result in a conviction of homicide where a criminal attack upon a cardiac cripple results quickly in collapse and death [*1*]. However, the issue is less clearly defined when a criminal act results in collapse and death during the attendant emotional turmoil in the absence of physical contact or injury. Two questions arise in any such case. Does emotional stress precipitate the death or is it mere coincidence? If there is a relation, how is it explained?

The preponderance of literature supports the premise that emotional stress may, in some individuals, precipitate sudden collapse and death. Pruitt [*2*], in a reflective review of "a spectrum of fatalities that have as their common feature the absence of causally related organic lesions," considered situations where mild to moderate coronary artery disease resulted in death; he also studied dive reflex phenomena, psychologic death in animals, and voodoo death. Readily demonstrable organic or chemical lesions are not necessary prerequisites to designation of a category of death. Engel [*3*] studied life settings in which sudden death occurred during psychological stress. Over a six-year period he gathered 170 such cases from news reports and from colleagues aware of his interest. All victims were reacting emotionally to the event when collapse occurred. Twenty-seven percent of

[3] Replies were received from one or more medical examiners, and some attorneys, from the following areas: Arizona, Arkansas, California, Colorado, Delaware, District of Columbia, Florida, Georgia, Hawaii, Kansas, Maryland, Michigan, Minnesota, Missouri, Montana, New Jersey, New Mexico, New York, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, Washington, Wisconsin, and the Province of Ontario.

these occurred in a setting of personal danger. All circumstances involved events impossible for the victims to ignore and a response of severe excitement or despair, or both. Malik [*4*] reported 22 cases where emotional stress was an apparent precipitating factor in sudden death ascribed to coronary insufficiency. Two of these involved victims of crime. Wiecking [*5*] reported a murder conviction in a case of sudden cardiac death during an armed robbery.

There is no doubt that emotional stress alone can result in cardiac activity akin to response to physical exertion. Carruthers et al [*6*] reported pronounced cardiac responses where subjects were engaged in arduous exercise on a rowing machine, in the absence of competition, and similar responses where there existed only the emotional effect of public speaking. These authors cite numerous references from the literature that furnish a broad understanding of physiological responses to acute stress.

Ventricular fibrillation is the most common lethal arrhythmia of sudden cardiac death before admission to a hospital [*7*]. Lown and Verrier [*8*] have demonstrated that psychological stress can reduce the threshold of ventricular fibrillation and that psychological factors may induce lethal arrhythmias in humans [*9*]. The sympathetic nervous system plays a significant role in such events [*10*], for the "brain and heart autonomic connection" is well established [*11*]. Further, Engel [*12*] makes the point that psychologically induced sudden cardiac death "is more likely to occur during periods of psychologic uncertainty," clearly the situation when one is faced by an armed intruder.

It is not credible to allege that the body of medical historical data on this subject is mere coincidence, especially when supported by physiological rationale. If pure emotional stress cannot be considered sufficient precipitating cause, what of physical battery of less than usual fatal severity when applied to the person with cardiac disease? If one accepts the premise that physical battery can aggravate natural disease to the point of death, then the same concept of autonomic nervous system responses can be applied to cases with emotional stress alone in predisposed individuals. What criteria should suffice to establish proof beyond reasonable doubt?

1. The criminal act should be of such severity and have sufficient elements of intent to kill or maim, either in fact or by statute, so as to lead logically to a charge of homicide in the event that physical injury had ensued.
2. The victim should have realized that the threat to personal safety was implicit. A logical corollary would be a feared threatening act against a loved one or friend.
3. The circumstances should be of such a nature as to be commonly accepted as highly emotional.
4. The collapse and death must occur during the emotional response period, even if the criminal act had already ceased.
5. The demonstration of an organic cardiac disease process of a type commonly associated with a predisposition to lethal cardiac arrhythmia is desirable. It is not, however, necessary to demonstrate an acute organic heart disease such as ruptured plaque, thrombus, or fresh infarct [*9*].

The pathologist called upon to perform an autopsy in a case of sudden death cannot rely solely on anatomical findings to render his opinion as to cause of death because death is the result of dysfunction. As previously noted, emotional stress affects function. Therefore the pathologist must have the benefit of a full and complete investigation before his opinion may be used to exonerate or to charge an individual with criminal responsibility. The essential elements of such a homicide charge reside in the circumstances which cannot be revealed by the autopsy, however minute and detailed.

Finally, it may be prudent to seek qualified medical consultation sufficient to support courtroom opinion. This is one situation where a medical defense may be expected with certainty.

Can sudden cardiac death be murder? Yes, it may constitute murder or some other degree of homicide, but only where the evidence for prosecution is based on meticulous reconstruction of events in time and motion coupled with careful autopsy study. The courtroom medical expert opinion should be carefully expressed within a total context of circumstance and autopsy observation and in terms of medical opinion sufficient to establish proof beyond a reasonable doubt.

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