Editorial
Determination of Cause of Death after Autopsy- "A Dilemma"

I U R KHALIL K AZIZ M U MEMON
Department of Forensic Medicine & Toxicolog, Khyber Medical College, Peshawar, F.J. Medical College, Lahore
Correspondence to Dr. Khalid Aziz, Associate Professor

Determination of the cause of death after autopsy is the fundamental responsibility of the autopsy surgeon, yet very little has been written about the criteria that need to be satisfied to make this decision. This issue causes confusion in courts where both autopsy surgeons and lawyers fail to appreciate the philosophy of causation. It is generally assumed and believed by the lay public including lawyers that the cause of death will be easy to establish after detailed autopsy. However, things are not always as simple as they seem. Leaving aside the cases where the lesion observed at autopsy is incompatible with life (e.g. decapitation) what infact usually happens in coming to a conclusion is that a cause of death discovered at autopsy, which accords with the medical history and circumstances, is elevated to the cause of death. The autopsy surgeon makes a subjective decision that a certain autopsy finding is capable of leading to death, and that is consistent with the deceased's medical history and circumstances of death. Furthermore, a conclusion about the cause of death is retrospective and cannot be tested. These problems emphasize the need to discover all the pathological processes present in the deceased before considering them in relation to the medical history and the circumstances of death.

Causation Philosophy and Problems.

One group of academicians believes that the cause is not only sufficient but is necessary for the effect: A is always followed by B, and B never occurs unless A occurred. Others disagree and advocate that it is the sum total of the conditions in which an event occurred: It is not correct to isolate one of the conditions in which an event occurred as the exclusive cause. To the One, The statement "The rising of the sun causes daylight", would have been reasonable, since the rising of the sun is always followed by daylight, and daylight never comes about unless the rising of the sun has occurred. To Others, the statement is, in fact, incomplete because daylight could not occur unless there is an atmosphere. So one must include an atmosphere in the statement about what causes daylight because it is one of the conditions in which the event occurs.

The restrictiveness of the first group can be seen in the commonest cause of death in the western world: coronary atherosclerosis. The development of the coronary atherosclerosis is not always followed by death, and death does not occur only when coronary atherosclerosis has developed. Yet clearly it is a reasonable proposition that coronary atherosclerosis has been the pathological basis for an enormous number of deaths. It seems that the first approach is suited more to those cases where the cause of death is incompatible with life. This is not to say that other's approach is necessarily the answer. Take the example of a heavy smoker who dies of carcinoma of the lung. One of the conditions in which the death occurred is smoking, but there are more: a person may smoke because of the effect of advertising, because of parents, because of particular personality trait. The autopsy surgeon (and in some cases, courts) have to make a practical decision that cause stops somewhere. In general, the line is drawn at the "Medical Cause" of death, but as the example shows, this is often unsatisfactory: because smoking is increasingly noted again on death certificates in western world.

Autopsy surgeons have some instinctive understanding of these issues but there are a particular sort of cases where the difficulties are even greater.

Injury or Disease not Sufficient in itself to Cause Death, but Death Occurred.

Non-fatal injury precipitates death in a relatively short time from natural causes.

Sudden death during a fight where the only findings at autopsy are some bruises and coronary atherosclerosis is common. The pathological cause of death will be given as coronary atherosclerosis and the law will require an opinion about the relation between the fight and the cause of death. Linking the death to exertion during the fight may have substantial legal consequences as the survivor, if the aggressor, may be charged with murder. At the trial, the autopsy surgeon will almost certainly be asked: " But doctor, could not this man have died at any time?" while it can be agreed in general that a person with this degree of atherosclerosis is at risk from sudden death, in this particular case, the death cannot be separated from the circumstances in which it occurred. This is an approach based on the view that cause is the sum total of the conditions in which the event occurred.

A peculiarity of the victim renders a survivable injury fatal

In our legal system, it is usually a rule that assailants take their victims as they are. So that if the victim has a bleeding disorder which would turn a minor injury in to a fatal one, that does not diminish the responsibility of the assailant for causing death. (Although it will obviously affect the out come of a trial.) A victim with a bleeding disorder went in to an argument with assailant. The

description from the eye witness was that the victims face was pushed causing him to fall on the ground. The assailant then left. Victim was found unconscious at home two days later and was dead on arrival at hospital. On autopsy subdural haemorrhage was found to be the cause of death. No scalp or facial bruises were present. The contribution of the bleeding disorder to victim's demise could not be denied. The assailant should even not be proceeded against in this particular case, because if the victim had survived and complained to the police, the assailant would not have been charged with assault. (Not every one would agree with this logic---- a thief opening a safe in ignorance of its contents will probably receive a heavier sentence if it contains a million rather then a hundred.) Had this case gone to court, unless there was good evidence that clinical deterioration could be related directly to the assault, it may have been difficult to refute the argument by the defense council. " Well, doctor, we admit pushing of the victim, but you can't say whether or not he fell on the way home or possibly even turned his head sharply when something caught his eye. Because trivial trauma (Which is the prosecution's case) could have precipitated his fatal subdural haemorrhage, it is possible that it was some other trivial trauma which initiated the fatal chain of events in this case".

Substantial delay between injury and death.

One of the classical casual problems is that of pulmonary embolism and its relation to antecedent events. Again consider the example of a victim who was stabbed with knife in the back of chest and was taken to hospital, where his condition remained stable and he was managed conservatively. Management included a chest drain and a close observation. 48 hours after admission, he had a cardiovascular collapse from which he was resuscitated. After five weeks of admission, he was discharged. One week later he collapsed and died in his bathroom. The autopsy revealed stab wound scar on the posterior pleura, massive bilateral pulmonary embolism, deep vein thrombosis of calf, chronic bronchitis, coronary atherosclerosis and unsuspected adenocarcinoma of the rectum with liver metastases. The case was proceeded with a homicide, the cause of death being "Pulmonary embolism with chronic bronchitis and metastatic carcinoma of the rectum, six weeks after being stabbed in the chest leading to cardiovascular collapse.

Part of the opinion included in the autopsy report was that the stab wound initiated a chain of events which culminated in the pulmonary embolism. The main thrust of the defense is that the deep vein thrombosis and subsequent pulmonary embolism could have been caused by the carcinoma of the rectum, and it was unnecessary to attribute any contribution to death from the stab wound and its consequences -------"But doctor, you cannot exclude, can you, that this man died from a complication of his metastatic cancer, a well recognised complication I might add, and that the stab wound might have had nothing to do with it". The answer is that there are multiple causes in this case, and no way off apportioning weight to each. A corollary of this is that no one cause (eg, stabbing and its consequences) can be discarded as having no weight. In this case, there is an interaction between various factors: A man with these pre-existing conditions who is stabbed in the chest would be more likely to get a deep vein thrombosis and died from pulmonary embolism than one who was not stabbed in the chest. On this basis, autopsy surgeon cannot agree to exclude the stabbing from the cause of his death. Responsibility cannot be apportioned between this stabbing and the cancer, but the opinion must be that both are involved in causing death. In the case of a pulmonary embolism following some time after an injury and period of immobilization, the suggestion will often be made that the condition can occur spontaneously and therefore that injury did not cause death. A deep vein thrombosis and pulmonary embolism is only ever considered spontaneous when autopsy fails to discover an adequate explanation. if an adequate explanation is discovered then there is no need to resort to calling the embolism spontaneous. In this respect, a spontaneous deep vein thrombosis is like the diagnosis of SIDS: The label can be used only if an adequate explanation cannot be discovered. The discovery of such an explanation precludes use of the label.

Decomposition obscures the effects of injuries or disease.

Autopsy surgeons have numerous cases where much or all of the pathological evidence has been obliterated by putrefaction and the greatest difficulties arise when there is a possibility of foul play.

Cause is Completely Dependent upon Interpretation of Circumstances.

Occasionally, the cause of death is completely dependent upon an interpretation of the circumstances.

A healthy individual working with electrical machinery suddenly collapsed and died. His workmates thought he had been electrocuted. The results of the examination of the machinery by experts were controversial; some say it was conceivable that the machine had been electrically alive, while others say it was not. At autopsy, there were no marks of electrocution. The only positive finding was appreciable hydrocephalus but no acute cerebral oedema. There were no abnormal histological or toxicological findings. If it is assumed that uncomplicated hydrocephalus can cause sudden unexpected death, it is easy to see the cause of death is completely dependent on the assessment of the machinery by electrical experts. Even the assessment of the circumstances contained casual issues because the experts who says it was conceivable that the machine could become electrically live, could not say that it actually had been.