

Autopsy: A Fading Investigative Tool

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Numerous television shows today are based on forensic pathologists as protagonists, such as CSI, Bones, etc., where the value of the autopsy in determining the cause of death is indispensable. Interestingly, as the lay public's recognition of the value of autopsy in determining the cause of death is at an all-time high, the utilization of autopsy in hospital deaths is at an all-time low. In the past, autopsies were regarded as the definitive evidence in any death, and rates of autopsy for hospital deaths were once as high as 50 percent in the 1950s.¹ A recent eight-state survey demonstrated an alarmingly low rate of autopsy (median) of 2.4 percent.² The primary reason suggested for this decline is improved pre-mortem diagnostic tools such as computerized tomography, genetic assays, and biochemical markers of disease that may render the autopsy redundant. And it is expensive redundancy in an industry that is increasingly scrutinized for cost containment. The median cost of autopsy in the eight-state survey was \$852 (average \$1,275),² and the cost of autopsy is shouldered by the county, state or frequently the hospital. Consequently, autopsies of patients are viewed as a money-losing proposition that may not contribute to the determination of the cause of death.

Because of the concern that an invaluable investigative tool may be lost, particularly in medicolegal cases, we examined the role of autopsy in determining the cause of death and in the defense of the anesthesiologist in the ASA Closed Claims Database. The ASA Closed Claims Database contains data collected on detailed data collection forms from claims collected from approximately 35 professional liability insurance companies across the country. Between the years of 1990 and 2001, 416 claims with autopsy were identified from 730 claims associated with death. Information in the narrative of the claims was provided in 209 of the 416 claims. These 209 claims were reviewed by one anesthesiologist and one pathologist to evaluate the utility of autopsy in determining the cause of death and by two anesthesiologists to assess its role in defense of the anesthesiologist. A third anesthesiologist served as the tie breaker for the final judgments. Inter-rater reliability was determined by kappa scores.

Demographics of Claims With Autopsy

The 416 claims with autopsy had a significantly higher proportion of cases ($p < 0.01$) who were healthier (ASA status 1-2) and younger (age < 65 years) than the 314 claims without autopsy. There were no significant differences between groups with respect to gender or emergency procedures.

Determination of Cause of Death

Autopsy information provided pathological diagnoses but not an unequivocal cause of death in 33 percent of claims. These claims would include autopsy results of significant coronary artery disease, unknown congenital heart defects, undiagnosed cancer, etc. – pathological diagnoses that may have caused or contributed to the death but are not an unequivocal cause of death. The autopsy data provided an unequivocal cause of death in 11 percent of claims (kappa 0.70). These claims would include findings of massive pulmonary saddle emboli, aortic aneurysm rupture, etc. The remaining claims either had insufficient information to categorize or provided no autopsy information in the narrative.

Agreement With Clinical Diagnosis

Autopsies revealed unexpected pathological findings in 25 percent of claims (kappa 0.38, Figure 1). The autopsy results provided pathological information that refuted a prior diagnosis in 4 percent of claims (kappa 0.66, Figure 1) and that confirmed a prior diagnosis in 25 percent of claims (kappa 0.61).

Utility of Autopsy in Defense of Anesthesiologists

The autopsy results identified a significant non-anesthetic contribution to the patient's death in 31 percent of claims (kappa 0.64) and helped in the defense of the anesthesiologist in 30 percent of claims (kappa 0.72, Figure 1).

Discussion

The higher proportion of autopsy in deaths involving younger, healthier patients is not surprising, as many of these deaths may have been unexpected in this population,

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and both families and physicians may have wanted additional information. Assessing the benefit of autopsy through this retrospective database is difficult, as the quantity and quality of information contained in the narrative was not controlled. Because of this potential bias, we included all autopsies in the denominator for calculating proportions.

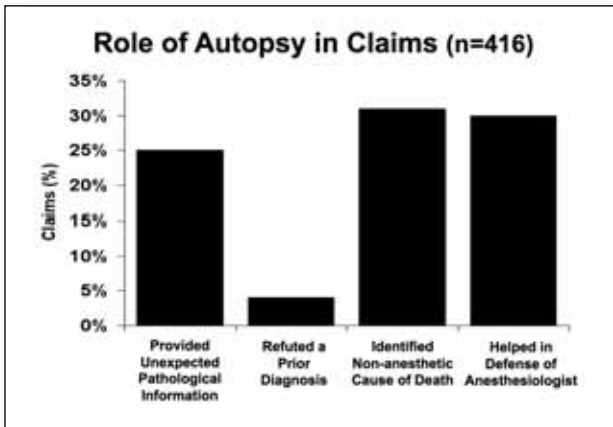


Figure 1

Thus, the true value of autopsy may be underestimated in this analysis.

Despite these limitations, the autopsy was able to determine an unequivocal cause of death in almost 11 percent of claims. Autopsy results confirmed the clinical diagnosis in one quarter of the claims, refuted it in 4 percent of claims,

and revealed unexpected findings in one quarter of claims. For medicolegal defense, the value of the autopsy was evident in that one third of claims had autopsy results that identified a significant non-anesthetic contribution to the cause of death, and one third of claims had autopsy results that benefited the anesthesiologist's defense.

In many instances, autopsies may not provide additional useful information, such as in cases of difficult intubation where the endotracheal tube is eventually placed in the trachea after prolonged hypoxia or cardiac arrest under neuraxial anesthesia with a high block. Yet identification of co-existing diseases may influence the interpretation of clinical events leading to death. There are many cases where the cost of autopsy would be difficult to justify, such as an 85-year-old who falls, becomes a C2 quadriplegic, and subsequently is withdrawn from life support. However, any unexpected death that occurs in the hospital should have an autopsy performed, and most hospitals have such mandatory autopsy rules in place. Many physicians and patients find the practice of anesthesia somewhat of a black box of potential catastrophe and will frequently assume an anesthetic error whenever there is an adverse outcome. The value of autopsy in these instances to the body of medicine and to the family and health care providers can be enormous.

References:

1. Hooper JE, Geller SA. Relevance of the autopsy as a medical tool: A large database of physician attitudes. *Arch Pathol Lab Med.* 2007; 131(2):268-274.
2. Nemetz PN, Tanglos E, Sands LP et al. Attitudes toward the autopsy – An 8-state survey. *Med Gen Med.* 2006; 8(3):80.

Update on the Anesthesia Awareness Registry

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If you had a patient with unanticipated intraoperative awareness under general anesthesia, please consider referring him/her to the Anesthesia Awareness Registry by calling (206) 616-2669. You can download a patient information sheet about the Anesthesia Awareness Registry at the project Web site if you wish to provide information to your patients. Participation in the Anesthesia Awareness Registry requires informed consent for participation as approved by the University of Washington Human Subjects Review Committee. Subject recruitment and consent must be conducted by University of Washington research team members.

If you have further questions concerning the Registry, please contact me at kdomino@u.washington.edu.

Sources:

1. Kent CD. Liability associated with awareness during anesthesia. *ASA News.* 2006; 70(6):8-10.
2. American Society of Anesthesiologists Task Force on Intraoperative Awareness: Practice advisory for intraoperative awareness and brain function monitoring. A report by the American Society of Anesthesiologists Task Force on Intraoperative Awareness. *Anesthesiology.* 2006; 104:847-864.