

Who Will Do My Autopsy?

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"My friend was ill, I cared for him; he died, I dissected him"

—Ascribed to various French physicians

One of the many indelible lessons I learned as a resident pathologist at The Mount Sinai Hospital, New York, from 1965 to 1969, was that performing an autopsy on another physician, and particularly on another pathologist, was a great privilege. I learned this first from Max Robinowitz, MD, my chief resident, with whom I performed my first adult autopsy: a 71-year-old physician with thymoma-associated myasthenia gravis who died with extensive bronchopneumonia. When a hospital staff physician died, the chief resident would perform the autopsy, assisted by a first-year resident.¹ Hans Popper, MD, PhD, our chairman, would review the gross organs and histologic sections.

In 1968, I was chief resident and reviewing a tray of microscopy slides with my teacher, the legendary surgical pathologist Sadao Otani, MD.¹ He rolled up his sleeve and brought my fingers to feel a firm, painless, movable, subcutaneous forearm nodule, which he diagnosed as "calcifying epithelioma of Malherbe" (pilomatrixoma). "When you do my autopsy," he shook his finger at me to emphasize, "don't forget." Four months later he died of severe pulmonary emphysema with heart failure and bleeding gastric ulcers. Privileged to carry out the autopsy, along with a first-year resident, I confirmed his diagnosis.

Over the years I performed or oversaw autopsies on other physicians, including, in recent years, two internationally renowned pathologists who were close friends and who died at my hospital. In both cases, despite care by outstanding physicians using highly sophisticated devices, the principal diagnosis and cause of death were not recognized before death. Findings in each proved important for family members. Another colleague told me he hoped his own autopsy demonstrated important unsuspected findings, as is the case in more than 10% of hospital autopsies, for the ongoing education of the performing pathologist and also to emphasize the procedure's continuing value.

For many years, I was the principal attending pathologist on the autopsy service each July, performing the first autopsy with each new resident. I taught the classic Rokitansky-Letulle "medical autopsy" refined at the University of Vienna, Austria, with Rokitansky and promoted at Mount Sinai by Paul Klemperer, MD,² one of the greatest pathologists of the first half of the 20th century, and his successor, Hans Popper, MD, PhD.³ Both were graduates of the Vienna medical school, an institution integral to the history of pathology. I also reviewed with residents most autopsies performed at the institutions to which I belonged, after they had been reviewed by the assigned staff pathologist. Residents once gave me a t-shirt bearing the name "Sherlock" because I found so many things the reviewing pathologist had missed.

With this background I comment on the status of the autopsy today.

Autopsy serves many purposes, not least of which is to help novice pathologists learn to examine and interpret macroscopic pathology in preparation for practicing surgical pathology. An informal phone survey of senior pathologists at teaching centers across the country confirms that "gross pathology" and autopsy performance are, no pun intended, dying arts. My own experience visiting various teaching centers confirms there is little, sometimes no, emphasis on gross pathology. Staff pathologists supervising autopsies in teaching programs rarely claim autopsy as their primary interest and, equally important, usually have other, major responsibilities. These factors, coupled with the paucity of autopsies performed, makes it almost impossible for a resident to become proficient in autopsy technique and, most importantly, autopsy/macroscopic interpretation. Autopsy services are often overseen by relatively young pathologists whose teachers themselves had only limited experience. Too often these well-meaning individuals do not participate in the actual performance of the autopsy and do little to promote its use. In some programs a forensic pathologist oversees autopsy, providing considerable practical experience but not that of the traditional "medical" autopsy. In addition to not seeing all gross abnormalities, nuances of anatomy reflecting embryonic/inherited changes are often not recognized or are ignored, and consequently not well documented. Even with supportive faculty, the number of residents available to perform an autopsy is limited; they generally have other responsibilities in addition to autopsy. Except for the most devoted of residents, autopsy usually takes second or third place in terms of attention and available time. Years ago it was not unusual to perform as many as four or five autopsies in a day. Now, any increase in autopsy numbers beyond a few a

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week can be a logistical and physical burden in most departments.

Residents learn, outside the forensic setting, that autopsies are not that important. Pathology chairs did not earn their academic renown and, with rare exceptions, faculty members did not earn promotions because of their interest and skills in autopsy. The pathology chair may not attend autopsy conferences at all. Most pathology faculty members try to avoid autopsies. Generally no one speaks for the autopsy in mortality conferences; only rarely will someone ask, "Was an autopsy performed?"

Reviewing cases already overseen by a staff pathologist, even if they specifically chose to be on autopsy service, is often disheartening. As only a few examples: coronary arteries were not always studied if the case was not "cardiac"; pulmonary hilar vessels were not regularly examined without clinical suspicion of pulmonary embolus, and the morphologic characteristics of prior, almost completely resolved, emboli are not recognized; proximal bronchi are not consistently opened; and experienced renal pathologists fail to show residents how to demonstrate renal pelvis and calyces, and they often are unexposed. A retrospective "quality assurance" (QA) study of a year's autopsies demonstrated only a single case, other than those for which I was directly responsible, in which even one parathyroid gland was identified, even with clinically apparent chronic renal insufficiency. No one seems to know that parathyroids are almost impossible to find after fixation. The portal vein was generally not identified or opened, even in cases of cirrhosis. The fact that the Chiari network of the coronary sinus is rarely noticed is troubling, but not as much as the failure of faculty members to recognize the early morphologic features of heart failure.^{4,5} Few faculty members know how to expose the inner ear (once a regular practice in children dying of pneumonia) or obtain posterior ocular/retinal tissue in cases of advanced diabetes mellitus. Another QA study demonstrated that laboratory test values were not included in the clinical summary in the overwhelming majority of cases. Neither of these QA studies elicited any discussion in the staff meetings at which they were presented, and there was little, if any, improvement in practice in the following year. Neither the College of American Pathologists nor the Joint Commission on Accreditation of Healthcare Organizations inspection in that period paid attention to autopsy performance. I have seen similar occurrences in other centers.

The teaching center autopsy problems are compounded by the increasing use of pathologists' assistants (PAs) in both autopsy and surgical pathology. This practice was introduced many years ago by pathologists to ease their workload. PAs are increasingly responsible for dissection. In surgical pathology, not the subject of this discussion, residents may study cases without looking at the gross pathology, relying on someone else's (often suboptimal) gross descriptions, and gross images may not be looked at before sign-out, if at all. In some hospitals the PA or autopsy technician carries out the en bloc evisceration as well as dissections, and prepares the organs for subsequent review by the resident.

In time, most likely decades rather than years, molecular testing of blood may replace invasive procedures for both surgical and autopsy pathology. Far in the future, external handheld scanners, similar to those imagined for Dr McCoy of the starship Enterprise, may diagnose all morphologic and physiologic abnormalities, including precursor lesions,

without invasive procedures or costly imaging approaches. Ongoing efforts to promote the "virtual" autopsy have demonstrated well that existing technology does not replace a thoughtful, careful postmortem inspection and dissection.⁶ In the meantime, autopsies remain valuable in the medical care of the patient who has died.^{7,8} The problem worsens each year as our population grows older, because the diagnostic discrepancy rate is greatest in the elderly.

How to improve? The task is daunting in any individual hospital setting. As the autopsy numbers decline fewer resources are available. Many small hospitals do not provide space for autopsy and, not uncommonly, a funeral home may be the venue for this medical procedure—one more disincentive for the pathologist. The best answer would seem to be in establishing regional autopsy centers in academic centers, an idea promoted more than 30 years ago. Such centers exist in some areas and thrive, although many employ a forensic rather than medical approach, not fully satisfying the traditional purposes of the hospital autopsy. The development of a viable business plan can be challenging, although regional autopsy centers can be profitable. In addition to relieving hospitals of the responsibility and expense of the autopsy, the regional autopsy center allows for quality autopsy performance, maximizing value in terms of both medical science and medical economics. Young pathologists have the opportunity to learn how to perform and interpret the autopsy and can carry out meaningful scientific studies. The accuracy of currently unsubstantiated, and in many cases worthless, death statistics about people who die in the hospital setting would improve.

Should we just accept the realities of modern medical practice? The stethoscope is hardly used by young physicians, who increasingly rely on other techniques. Surgeons may soon stop using their hands directly on patients, relying instead on endoscopic tools or robotic procedures.⁹ The microscope has already disappeared from medical education, replaced by computer images, and will soon disappear from the practice of pathology because scanned slides provide high-quality resolution and allow study any time in almost any place. Despite continuing evidence that autopsy reveals important unexpected diagnoses in a relatively high number of cases,⁷ with very high discrepancy rates in selected settings,¹⁰ autopsy rates in US hospitals are already well below 5%. Should we accept that autopsies are no longer a part of medical practice except in a very few centers where they are championed, particularly by chairs of medical, as well as pathology, departments? Increasing use of postmortem sophisticated imaging has not yet replaced the well-performed autopsy⁶ and, despite the enthusiasm of nonpathologists, cannot solve the problem because radiologists will be unable to devote more time to the dead than the living, for obvious reasons as well as because there is, at present, no system for compensating for procedures carried out after death. If pathologists no longer study the great majority of people who die and if other techniques are not yet ready to meet the task, we will no longer learn from the dead.

In the meantime, the situation is dismaying. With fewer and fewer young pathologists familiar with autopsy techniques and unable to interpret the macroscopic findings, and despite a lifetime promoting autopsy to clinicians, pathologists, and the public,¹¹ I now question continuing to promote autopsy, especially for family members who die or even for the patient population at

large. Is it even ethical to recommend a medical procedure when the great likelihood is that it will be performed and then interpreted by those not equipped for the task? When an autopsy is performed it is often specifically directed to answering the clinician's question rather than recognizing the still considerable and significant discrepancy between clinical diagnoses and autopsy diagnoses. Early changes foreshadowing a variety of lesions go unrecognized. Who still considers autopsy an objective scientific study of the dead body performed by experts in the field?

Increasingly, I find myself asking: Who will do my autopsy?

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