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Classical mistakes in forensic pathology*

These are several unique features of the mistakes that are peculiar to the performance of medicolegal autopsies. One is the frequency with which mistakes are made by good pathologists. Another is the frequency with which a seemingly trivial error turns out to have disastrous consequences. Perhaps fewer mistakes would be made if there were more widespread appreciation of what constitutes a mistake in the performance of a medicolegal autopsy, and why it is a mistake.

The factual material upon which this discussion is based is derived from several sources. First are the mistakes that I have made. In the course of 30 years, their number and variety have become formidable. Another source of information represents the mistakes that other pathologists have made in the performance of medicolegal autopsies. I have learned of these errors from reading their autopsy protocols or from performing second autopsies on exhumed bodies.

Inasmuch as I was not sure that I had either made or heard about all of the important mistakes that should be brought to your attention, I recently made inquiry of a group of colleagues who have had large experience in the field of forensic pathology. Their replies constitute my third source of information.

VARIOUS MISTAKES IN FORENSIC PATHOLOGY

Mistake of not being aware of the objective of the medicolegal autopsy

I am sure that many, if not most, of the mistakes that are made stem from the fact that hospital pathologists are so often unaware of some of the important objectives of the medicolegal autopsy. It should be realized that the medicolegal autopsy is often expected to provide information that would not be looked for in an ordinary hospital case, i.e., information that is important for legal, rather than medical, reasons. An examination that would be entirely adequate by ordinary medical standards may be so inadequate from a medicolegal standpoint that a murder may not be recognized or an innocent person may be charged with a murder that was not committed. Thus, if the pathologist is to avoid mistakes in the performance of a medicolegal autopsy, and particularly in an instance in which homicide is a possibility, he should be aware that, in addition to determining the cause of death, he (and he alone) may have access to information that may be essential in establishing 1) the identity of the dead person; 2) the time of death; 3) the circumstances in which the fatal injury was sustained; 4) the type of weapon or agent that was responsible for the injury; 5) factors that may have predisposed the victim to injury, or modified the effects of the injury; 6) the identity of the person (or persons) responsible for the injury.

An excellent illustration of the importance of being aware of the objectives of the medicolegal

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autopsy is provided by the following case. I am sure that the pathologists who participated will remember it with great embarrassment. The sudden and somewhat mysterious death of a notorious person in a tavern aroused a good deal of public interest, especially after the coroner had ruled, without benefit of autopsy, that death resulted from natural causes. Arrangements were made for an autopsy and two locally prominent hospital pathologists were engaged for the task. Their examination disclosed that death resulted from traumatic laceration of the liver and massive intraperitoneal hemorrhage. This finding led to the arrest of a suspect who was charged with having killed the decedent by striking and kicking him in the abdomen. At the trial some weeks later, the defendant's attorney, in maintaining his client's innocence, alleged 1) that the decedent had been drunk and quarrelsome at the time of the alleged assault, and that, as a result of this, he had made an unprovoked attack on the defendant, striking him repeatedly on the head and face with his fists, and 2) that the decedent had sustained his fatal injury by falling against the sharp corner of a table, rather than by being struck or kicked by the defendant. If these statements were true, the defendant was innocent. It was expected that the autopsy findings would throw some light on the true facts.

When the pathologists who performed the autopsy were on the witness stand, the attorney brought out the fact that they did not 1) test the dead man's blood or brain for alcohol, 2) examine his hands for evidence of bruises that would be consistent with his having been in a fist fight, or 3) examine his abdominal wall for injuries that might indicate the kind of impact that resulted in the ruptured viscus. The defendant was acquitted, but no one knows whether his story was true or false. If these pathologists had been better informed in regard to the objectives of the medicolegal autopsy, they almost surely could have obtained evidence that would have helped to establish whether the defendant's account of the altercation was true or false.

Mistake of performing an incomplete autopsy

A partial autopsy is always a mistake in a medicolegal case. The finding of coronary disease, presumably of sufficient extent to account for death, is the reason most often given for the premature termination of a medicolegal autopsy. Obviously, the existence of coronary disease, even though it is extensive, does not exclude the possibility that death resulted from injury or poisoning. Failure to perform a complete autopsy, or to save material for toxicologic analysis, is a dangerous practice in any in-

stance of clinically unexplained death, even though it appears that an acceptable cause of death has already been demonstrated.

Many pathologists do not ordinarily examine the cervical segment of the spinal column, the larynx, or the laryngopharynx, even though the cause of death was not recognized elsewhere. In a medicolegal autopsy, examination of these regions should never be neglected. If such an examination is not performed, there is an excellent possibility that a second autopsy may reveal an unsuspected injury of the cervical cord, with or without fracture of the spine, an impacted foreign body in the glottis or larynx, or the presence of laryngeal or perilaryngeal injuries that are indicative of manual strangulation.

Mistake of permitting the body to be embalmed before performing a medicolegal autopsy

The mistake of permitting a body to be embalmed before autopsy may be as disastrous as the performance of an incomplete autopsy. Even though the embalmer does not use a trochar, embalming invariably results in a wide variety of artifacts that tend to destroy or obscure evidence. Some of these are mechanical and some are chemical. Not the least is the fact that the embalming fluid renders the blood and tissues unfit for many toxicologic tests.

Mistake of regarding a mutilated or decomposed body unsuitable for autopsy

If the identity of the dead person or the cause of death is in doubt, do not make the mistake of advising that an autopsy is not worthwhile, owing to the presence of putrefaction, mutilation, or damage by fire. No matter how putrid or fragmentary the remains, careful examination is almost invariably productive of information that bears on the identity of the dead person, and such examination frequently discloses previously unrecognized evidence that is pertinent to the cause and manner of death. I have a vivid recollection of the case of an extensively burned body that was found in the smoldering remains of a burned-out farm house. The legs, arms, anterior wall of the chest and abdomen, and the top of the head had been destroyed. The coroner released the remains for burial, without further examination, inasmuch as he thought they were not suitable for autopsy. Subsequently, the body was exhumed for further examination, owing to the fact that an insurance company was not satisfied that the remains were actually those of the missing occupant whom they had insured. Examination of the charred remains disclosed 1) that the kyphotic condition of the spine and the edentulous condition of the mouth

indicated that the body was not that of the missing insured person, and 2) that death had been caused by a bullet wound, not by the fire. Considering the ease with which external evidence of murder might be destroyed by a conflagration, the desirability of performing autopsies on burned bodies is obvious.

Frequently the reluctance of a pathologist to perform an autopsy on a decomposed body is due to the odor and vermin, rather than to his belief that the examination would not be productive of evidence. There is rarely any legitimate reason for haste in the performance of such an autopsy, and storage of a decomposed body for 24 hours at near-freezing temperature will invariably mitigate the odors and tend to immobilize the vermin.

Mistakes resulting from nonrecognition or misinterpretation of postmortem changes

Bloating and discoloration. Pathologists who are not experienced in the examination of decomposed bodies are likely to form erroneous conclusions in regard to the appearance of a body during life. Gaseous bloating causes swelling of the lips, nose, and eyelids, as well as protrusion of the eyes. These changes, together with the generalized darkening of the skin, often make the face of the dead person completely unrecognizable. Moreover, the distension of the chest and abdomen tend to lead to a false impression of obesity. On several occasions I have reviewed autopsy protocols in which a dead body, described as that of an obese exophthalmic Negro, was actually that of a slender white person.

Vesication. One of the common phenomena of putrefaction is the formation of fluid-filled blebs beneath the epidermis. Such blebs are sometimes confused with vesication that results from antemortem burning.

Purging. After 24 hours in a warm room, bloody fluid is frequently purged from the mouth and nose of a dead body. If death was preceded by the development of pulmonary edema, a liter or more of fluid may be discharged. The finding of a body lying in such a pool of fluid has, on several occasions to my knowledge, led to the erroneous assumption that death was caused by a massive hemorrhage.

Nonuniform decomposition. It should be remembered that putrefaction tends to be accelerated wherever the skin has been broken or blood has accumulated in the tissue. Therefore, any region of the body surface where putrefaction is disproportionately advanced should be examined with particular attention to the possibility that it represents a site of antemortem injury. It is a frequent mistake to pass over such a region lightly, inasmuch as it seems to be particularly unfit for examination.

Rupture of the esophagus or stomach. Occasionally, and for unexplained reasons, agonal or postmortem digestion of the wall of the stomach or esophagus occurs so rapidly that the contents of the stomach are found free in the peritoneal or pleural cavity within a few hours after death. If the autopsy fails to disclose the true cause of death in such an instance, the death may be erroneously attributed to an antemortem injury.

Autolysis of the pancreas. As in the case of the esophagus and stomach, agonal or postmortem autolysis of the pancreas may be well advanced within a few hours. The process may be local, general, or multicentric, and the autolyzed tissue often becomes dark brown, suggestive of hemorrhage. I have known experienced pathologists to misinterpret such changes as antemortem hemorrhagic pancreatitis.

Abnormal distensibility of the rectum, vulva, and vagina. After rigor mortis has dissipated, these muscular canals become readily distensible. Thus, the easy admission of a larger instrument or more fingers than the canal would have readily admitted in life is sometimes erroneously construed as evidence of antemortem injury incident to rape or sodomy.

Heat fractures. Bodies that have been exposed to protracted and excessive heat after death frequently develop explosive fractures of the skull. Mistakes are sometimes made when such fractures are attributed to antemortem injury.

Thermal "hemorrhage." The same internal stresses that produce thermal fractures of the skull frequently result in massive extravasation of blood into the epidural space. Such extravasations may occur before sufficient pressure has developed to fracture the skull and, therefore, they may be observed independently of skull fracture. The possibility of misinterpreting such a change is obvious.

Thermal fat embolism. Droplets of sudanophilic fat are commonly observed in the pulmonary vessels of badly burned bodies. I do not know whether such droplets are carried to the lungs from the burned skin during the agonal period, or if they are formed after death by coalescence of the invisible droplets of fat in the blood. On the other hand, I am sure that they do occur independently of antemortem trauma. Do not make the mistake of confusing this kind of a thermally induced artifact with traumatically induced pulmonary fat embolism.

Mistake of failing to make an adequate examination and description of external abnormalities

In the usual hospital death from natural disease, the examination of the surface of the body is ordinarily

a relatively unimportant part of the autopsy. Rarely, if ever, is the hospital pathologist concerned with the condition of the dead person's clothing. In a medicolegal autopsy, however, the clothing and skin always deserve careful scrutiny and a detailed description of marks of damage or soiling. The clothing should be examined before it is removed from the body, and the skin should be examined before it is washed.

A pathologist may think that the condition of a dead person's clothing is a nonmedical matter to be dealt with by the police. If the condition of the clothing reveals facts that are pertinent to the circumstances or manner in which the injuries were received, its evaluation should be the responsibility of a medically trained person. Thus, I remember a fatal stabbing case in which the examination of the dead woman's clothing provided the critical evidence that was required for the conviction of the murderer. The stabbing was said to have occurred in the front seat of an automobile in which the victim and a male companion were riding. According to her companion, a strange man entered through a rear door while the car was stopped at a traffic light. The stranger was said to have leaned over the back of the front seat and to have stabbed the woman twice. He then jumped out of the car and escaped. From an examination of the wounds, it was not determined whether or not they could have been produced in this manner. On the other hand, when the location and course of the wounds were compared with the knife-holes in her clothing and in the covering of the seat upon which she was sitting, it was evident that they were not produced by the downward thrusts that she was supposed to have received. It was this evidence that was largely responsible for the conviction of her companion.

Similarly, in examining the wound in the scalp of a victim of a hit-and-run accident, the finding and preservation of a fleck of green paint, which might have been ignored by a pathologist who was not experienced in such cases, provided the critical evidence that was needed to exonerate an innocent driver and to convict the guilty one.

Although it would seem to be obvious that the location, dimensions, shape, depth, and special features of every wound should be described, such information is frequently inadequately recorded on protocols that are prepared by pathologists who perform only occasional medicolegal autopsies. In the protocol of a medicolegal autopsy, it is better to describe 10 findings that prove to be of no significance than to omit one that might be critical.

Recently, I examined the voluminous protocol of an autopsy that was performed on the body of a person who died of injuries sustained under un-

known circumstances. The pathologist used approximately 2000 words in his description of normal tissues, as well as of such abnormalities as adhesions, healed tuberculosis, a Chiari's network, a double ureter, and an ovarian cyst. The entire description of the injuries from which the woman died consisted of something less than 50 words. The district attorney commented that, although the document might be interesting to another pathologist, the protocol did not provide him with any useful information that was not in his possession before the autopsy was performed.

Mistake of confusing the objective with the subjective sections of the protocol

It is as surprising as it is distressing to note how frequently pathologists include statements of opinion and interpretation in the part of the protocol that is supposed to be objective and factual. The purpose of a protocol is twofold. One is to record a sufficiently detailed, factual, and noninterpretive description of the observed conditions, in order that a competent reader may form his own opinions in regard to the significance of the changes described. The other is to interpret the significance of the changes that were observed and described. Thus, a region of dark blue discoloration of the dermis, in the center of the volar surface of the left forearm, may or may not be a bruise. To refer to it as a contusion in the descriptive part of the protocol is to substitute an interpretation for a description, and this is as unwarranted as it may be misleading. A solid dark red, partially occlusive coagulum of blood in the lumen of an artery may be a thrombus, but to call it such is an interpretation that should appear on the diagnosis sheet, and not in the descriptive text.

In reviewing the protocol of a medicolegal autopsy, I found the description of the external genitalia of a teenage girl to consist of the statement that "the external genitalia showed extensive injuries, which had been incurred incident to assault and rape." Considering the facts that the girl's body was lying in a field for 10 days before it was examined by the pathologist and the various parts of her body had evidence of mutilation by animals, it would obviously have been much better if the pathologist had recorded exactly what he saw when he examined the body, rather than his interpretation of the significance of what he saw.

The mistake of not examining the body at the scene of the crime

Almost without exception, the various experienced forensic pathologists who contributed suggestions for the preparation of this review stressed the mis-

takes likely to occur if the pathologist does not observe the body at the scene, and prior to disturbance of the body or its immediate environment. In some localities and under some systems of law enforcement, that is not feasible, however desirable it might be. The circumstances often indicate that such a visit would probably be a waste of the pathologist's time.

In many instances of death by unexplained violence, it is a fact that appreciation of the full significance of the autopsy findings may depend on evidence that may be obtained only at the scene, and before the body has been moved. Not only may the evidence required for evaluation of the postmortem findings exist only at the place where the body was originally found, but its potential significance may be apparent only to a medically trained person. Thus, in view of the pathologist's knowledge that the fatal injury was immediately incapacitating, it may be apparent to him that someone other than the dead person must have moved the weapon, must have rearranged the bed clothing, or must have left a trail of blood on the floor. A great deal of this type of evidence may be preserved by adequate photography. Frequently, however, the evidence at the scene is of such a nature that it should be examined by the pathologist in its original state if it is to be correctly evaluated.

Mistake of substituting intuition for scientifically defensible interpretation

This brings me to one of the most dangerous mistakes in forensic pathology, and one that is particularly prevalent among experienced forensic pathologists who, for one reason or another, acquire a propensity for what might be called "categorical intuitive deduction." This Sherlock Holmes type of expert may see certain bruises in the skin of the neck and conclude without doubt that they were produced by the thumb and forefinger of the right hand of the stranger. He may see an excoriation of the anus and maintain unequivocally and without benefit of other elements of scientific proof that the assailant was a sodomist. He ignores the essential component for proof of the correctness of any such scientific deduction, namely, the nonoccurrence of such lesions or changes in control cases. Such a pathologist usually has the happy faculty of failing to remember the many similar bruises of necks that were known to have been produced by mechanisms other than pressure by the thumb and fingers. He fails to remember that many anal and rectal excoriations that were caused by injuries other than sodomy. Such a pathologist is a delight to newspaper reporters owing to the fact that he "makes good copy." He may be

highly esteemed by the police and by the prosecuting attorney because he is an emphatic and impressive witness. His prestige, together with his exclusive access to the original evidence, places him in an exceedingly powerful position in the courtroom. Rarely can the defense attorneys find anyone with comparable experience to evaluate the postmortem findings. On the other hand, if they do, it seems obvious to the jury 1) that the outside expert was hired to say something that would help the accused, and 2) that the outside expert, unlike the state's witness, was handicapped by the fact that he did not see the evidence with his own eyes.

It is difficult to estimate how much harm is done by these people. I know of a man who was hanged largely on the weight of such uncritical evidence. The ordinary hospital pathologist is not accustomed to being so continuously unchallenged as to permit him to acquire a full-blown God complex of the kind that I am discussing. The hospital pathologist must be able to defend his interpretations against clinicians who also have a certain amount of information about the facts in issue. It is only the full-time forensic pathologist who is likely to become accustomed to having his opinions go virtually unchallenged. The stakes are too high to play hunches in forensic pathology.

Mistake of not making adequate photographs of the evidence

If a negative or positive postmortem finding is so important that it may make the difference between the freedom or imprisonment, or the life or death of someone, every attempt should be made to protect, preserve, and record it for others to see and evaluate. No pathologist should regard himself so infallible that he is willing to carry such responsibility alone, if he can share it with others.

In other words, this is an exhortation that pathologists should prepare photographic records of all of the critical evidence that can be photographed, and particularly of evidence that might otherwise be altered or lost. It is one thing for the pathologist to state that he remembers that the fracture of the skull had a peculiar contour that corresponds to that of the hammer found in the back of the automobile belonging to the accused. It is quite another thing for the pathologist to have recorded this fact photographically. I recall a protocol in which the hole in the back of the head of a man who died of a through-and-through bullet wound was designated as the wound of entrance. No photographs were made. The description of the injuries was too meager for anyone else to form an opinion as to which was the wound of entrance and which was the wound of

exit. The shooting was not witnessed. If the bullet entered from the back, the probability of murder was supported. Proof of guilt rested almost entirely on the undocumented opinion of the pathologist who was relatively inexperienced in interpreting injuries caused by gunshot.

Recently, in one of our southern states, a person who was unjustly convicted of murder in a shooting case was released as a result of the pathologist who performed the original autopsy having made photographic records of his findings. This pathologist had originally misinterpreted the evidence, and, at the time of the trial, his misinterpretation was an important factor in bringing about the conviction. Inasmuch as he realized that he might have made a mistake, the pathologist eventually submitted the photographs for interpretations by more experienced forensic pathologists. It was then clarified that one of the wounds had been originally misinterpreted. This led to the reopening of the case and the subsequent release of the accused.

Another reason to make photographs, particularly of the surface of the body is that they provide a record of things that may not have seemed sufficiently important to warrant description at the time of the autopsy. In deaths by criminal violence, the presence or absence of a wide variety of seemingly inconsequential changes may subsequently prove to be important.

Mistake of not exercising good judgment in the taking or handling of specimens for toxicologic examination

Mistakes in this field are so varied and are made so frequently that it is difficult to know where to begin. Each of the pathologists whom I consulted in regard to this problem provided me with a list of mistakes that he had observed, and the lists are by no means identical.

Unclean containers. Specimens are often placed in unclean containers. Too frequently the pathologist who goes to an undertaking establishment to perform a medicolegal autopsy fails to take with him a sufficient number of clean containers for toxicologic specimens. Every toxicologist has had the experience of being requested to analyze for alcohol a sample of blood that was sent to him in a container which reeked of embalming fluid.

Contamination of specimens. The use of unclean containers is by no means the only cause of contaminated specimens. Thus, samples for toxicologic analysis of the liver, the brain, or other organs are often cut with the same instruments, and on the same surface upon which the stomach was opened.

Obviously, the significance of a given concentration of a substance in the brain is different from the same concentration of that substance in the stomach. The significance of the determination of mercury in postmortem material is frequently vitiated by possible contamination with Zenker's fluid in the autopsy room.

An excellent example of contamination of toxicologic evidence in the autopsy room is illustrated in the instance of a woman who was thought to have died of poisoning, as a result of having had cyanide thrown in her face. It was admitted in court that the pathologist used the same knife to obtain samples of tissue for toxicologic analysis that had been used to cut through the presumably contaminated skin of the upper part of the thorax. Inasmuch as the test for cyanide in her blood was equivocal, the presence or absence of cyanide in the lungs became a matter of critical importance. In the opinion of the defense, the finding of cyanide in the lung was without significance because of the probability of contamination. This was one of the principal reasons for the acquittal of the accused.

Permitting blood or tissue to putrefy. Every pathologist is probably aware that putrefaction may produce substances that yield false-positive tests for certain compounds, and that it may destroy other substances that would have yielded significantly positive tests. Why then would a pathologist allow a sample of blood or tissue to remain in a warm place for hours, or even days, before sending the material to the analyst? I dare say that this will happen next week in a dozen communities in the United States.

Inadequate samples. Samples submitted for toxicologic analysis are frequently too small. It is by no means uncommon for the toxicologist to receive a 20-ml test tube of gastric contents or a 120-ml tonsil bottle containing liver, with a request that he "examine for poison."

Send as much as you can—up to 500 g—of any material that you wish to have analyzed. If you wish to know only the level of alcohol or carbon monoxide in the blood, the sample may be smaller, but, even then, 20 ml is much better than 5 ml.

Poorly selected samples. Pathologists often fail to recognize that, from a chemical standpoint, the lumen of the alimentary canal is part of the external environment of the body. If they did, they would never limit their toxicologic specimens to the contents of the stomach or intestine. The finding of a foreign chemical substance in the contents of the alimentary tract usually means that the substance was ingested, but this finding does not necessarily establish the fact that a significant amount of the

substance was absorbed. Neither does the failure to find a poison in the alimentary tract exclude the possibility that the deceased person was fatally poisoned.

There is a great variation in the sites in which poisons may accumulate in the body after they have been absorbed, and extensive sampling is always desirable if the identity of the agent is not known. Of course, the material submitted for analysis should include any Vomitus present and any samples of food, beverage, or medicines that may have contained poison.

Unlabeled specimens. Several years ago we received an unlabeled cardboard container in which there were six unlabeled jars and bottles. The messenger who brought it said that Dr. X would call us in regard to the shipment. Two of the bottles contained blood, two contained gastric contents, and two contained a mixture of tissues.

Dr X subsequently called and said that he had sent the contents of the stomach, some blood, and certain tissues from a man whom he suspected of having died of homicidal poisoning with barbiturate. Inasmuch as the containers were not full, we asked why he had sent six rather than three. His explanation was that the messenger probably made a mistake and picked up three containers that belonged to another case, specimens that he decided not to send in for analysis. Fortunately, no barbiturate was found in any of the specimens, but, if it had been found, it might have been difficult, or even impossible, to establish which of the two persons had been poisoned.

Continuity of responsibility for protection of evidence. When an analytic result contributes to the proof that a crime was committed, or that the defendant is responsible for damages, the attorney for the defendant has the right and the obligation to try to establish whether or not the material tested came, *in fact*, from the place from which it was said to have come, and was, *in fact*, in virtually its original condition. Among other things, this means that some responsible person must be able to vouch for the specimen during every minute of the time that elapsed between its collection at the autopsy and its analysis in the laboratory.

The fewer the persons involved in this responsibility, the better is the chain of evidence. The specimens should pass from hand to hand, and they should never be left in a place where they could be tampered with or become altered.

The analyst must also be certain that there is no reasonable possibility that the tube upon which he made his final test could have been confused with some other tube during the analytic procedure. This also applies to sections of tissue for microscopic

examination. There must be no reasonable possibility that the section of tissue with the critical microscopic changes could have been confused by the histology technician with a section of tissue that was derived from some other place or person.

Preservation of the excess material. Whenever possible, the analyst should retain samples of original evidence, in order that it may be examined by other experts if such examination is authorized by the court. Frequently, when the settlement of a legal issue depends upon the results of a laboratory test, it is requested that the original material be made available for reexamination by another toxicologist. Such a request may be legitimate, and the pathologist or toxicologist who finds that this can not be done, because the material was exhausted or destroyed in making the original examination, is often in an embarrassing and even indefensible position. The deep freeze is an indispensable part of the equipment in a laboratory where the staff deals with medicolegal evidence.

Facts bearing on identity of the poison. Too often the toxicologist receives specimens with no information, but only a request that he test for poison. If the person was found dead and if no information is available regarding the duration or nature of the fatal seizure, the toxicologist should be so informed. If a dead woman was known to be the mistress of a photographer, or if she was an employee in a silver-plating factory, the toxicologist should be told. A blind toxicologic analysis is a tremendous undertaking, and many days are required for its completion. I am in complete sympathy with the analyst who puts the specimen away, and forgets it, when he is told only to "look for poison."

Mistake of permitting the value of the protocol to be jeopardized by minor errors

Unless a pathologist has the experience of having been on the witness stand when his autopsy protocol was examined, word for word and line by line, by counsel for whichever side of the case was damaged by the evidence, he will not fully appreciate the potential gravity of this kind of mistake.

Assume that you are on the stand and have testified that the decedent came to his death as a result of an intracranial hemorrhage that was caused by one or more blunt impacts against the head. Assume further that you testified that the circumscribed depressed fractures of the skull are not consistent with their having been produced by an impact against a flat cement sidewalk, but that they are consistent with having been produced by a beer bottle that was shown to you as State's Exhibit No. 142.

Counsel for the defense does not like this evidence

and seeks to weaken or destroy it. He asks, "How does it happen that the date of the autopsy as recorded on the protocol is June 15, when the evidence shows that the death did not occur until June 16?" You explain that this is a typographic error.

Counsel asks, "Who witnessed the autopsy?" After reading the names of the three persons listed on the protocol as witnesses, it develops that the first name of one is incorrect, and that there was a fourth witness whose name was not included. Thirty minutes later, after disclosure of still other errors, it develops that you failed to notice that the left eye was prosthetic, and that, although you described the appendix as having no abnormality, the man unquestionably had an appendectomy some 5 years previously.

None of these mistakes has any real bearing on the important issue in the case, but, by the time they have emphasized and an articulate lawyer has commented on them, the jury begins to wonder whether any part of your report is reliable. There should be no mistakes in the protocol of a medicolegal autopsy, even though they seem to be unimportant.

Miscellaneous mistakes

Although the general areas in which most of the mistakes that are commonly made in forensic pathology have been discussed in the preceding paragraphs, there are certain specific examples of errors that deserve emphasis.

Errors of omission in the collection of evidence required for identification.

1. Failure to make frontal, oblique, and profile photographs of the face.
2. Failure to have fingerprints made.
3. Failure to have a complete dental examination performed.

Errors of omission in the collection of evidence required for establishing the time of death.

1. Failure to record the rectal temperature of the body.
2. Failure to observe changes that may occur in the intensity and distribution of rigor mortis—before, during, and after autopsy.
3. Failure to observe the ingredients of the last meal and its location in the alimentary tract.

Errors of omission in the collection of evidence required for other medicolegal purposes.

1. Failure to collect specimens of blood or brain for determinations of the contents of alcohol and barbiturates.
2. Failure to determine the blood group of the dead person if death by violence was associated with external bleeding.
3. Failure to collect nail scrapings and samples

of hair if there is a reasonable chance that death resulted from assault.

4. Failure to search for seminal fluid if there is a reasonable chance that the fatal injuries occurred incident to a sex crime.

5. Failure to examine clothing, skin, and the superficial portion of the bullet tract for a residue of powder, and the failure to collect samples of any residue for the purpose of chemical identification.

6. Failure to use x-rays for locating bullets or fragments of bullets if there is any doubt in regard to their presence and location.

7. Failure to protect bullets from defacement, such as is likely to occur if they are handled with metal instruments.

8. Failure to collect separate specimens of blood from the right and the left sides of the heart in instances in which bodies are recovered from water.

9. Failure to collect samples of fluid from the air passages and stomach in instances where bodies are found in water.

10. Failure to strip the dura mater from the calvaria and base of the skull. Many fractures of the skull have been missed because the pathologist did not expose the surface of the fractured bone.

Errors of omission that result in the production of undesirable artifacts or in the destruction of valid evidence.

1. Opening the skull before blood is permitted to drain from the superior vena cava. If the head is opened before the blood has drained from it, blood will almost invariably escape into the subdural or subarachnoidal space, and such an observation may then be interpreted as evidence of antemortem hemorrhage.

2. The use of a hammer and chisel for opening the skull. A hammer and chisel should never be used for this purpose in a medicolegal autopsy. Fractures produced by the chisel are frequently confused with antemortem injury.

3. Failure to open the thorax under water if one wishes to obtain evidence of pneumothorax.

4. Failure to tie the great vessels between sites of transection and the heart when air embolism is suspected.

5. Failure to open the right ventricle of the heart and the pulmonary artery *in situ* if pulmonary thromboembolism is suspected.

6. Failure to remove the uterus, vagina, and vulva *en masse* if rape or abortion is suspected.

Mistake of talking too soon, too much, or to the wrong people

Too soon. The performance of a medicolegal autopsy in an instance of known or suspected hom-

icide is almost invariably a dramatic event. The reporters, police, district attorney, and even your colleagues, may exert pressure to find out what you think before you have completed your investigation. It may be a temptation, and, in the case of the district attorney, it is often desirable to give impressions of the situation even though all of the facts are not in. *If you do so*, be sure to make it clear that the impressions are tentative and subject to change.

An illustration of the danger of releasing opinions prematurely is illustrated by the following case. Owing to the facts that the dead woman's body was still warm and there was no rigor, Dr. X, the pathologist, told the district attorney, who was eager to know the time of death, that the woman probably died early that morning. He provided this information before the autopsy had actually been started. The district attorney immediately passed this information to the reporters. Shortly before the noon edition of the papers reached the streets, the pathologist realized that he had talked too soon. The degree of autolysis of the parenchymatous organs, together with the presence of intravascular hemolysis, indicated a considerably longer postmortem interval than he originally thought. The noon edition of the newspapers carried two items on the first page, i.e., the district attorney's news release to the effect that Dr. X had established that the woman was murdered early that morning, and a recent news bullet stating that the murderer had just confessed that he killed the woman during the evening of the preceding day. Approximately 12 hours after the murder, and 2 hours before the body was found, the murderer moved her body from the warm room where crime occurred to the cool basement where the police found the victim. The interior of the body was warm because it had been in a warm place during most of the postmortem period. There was no rigor because rigor had developed and regressed. If the murderer had not confessed, and if he had been able to establish an alibi for the time that the murder was supposed to have been committed, he might have used the pathologist's premature and incorrect guess to support his innocence.

Too much. Do not let your desire to be helpful or to play the role of Sherlock Holmes lead you into the mistake of saying more than the facts warrant. A well-known pathologist in this audience once made this mistake, but I am sure he will not mind my telling you about it. An ex-gangster, whom many people might have wished to murder, was found dead on the floor of the lavatory in his own tavern. He had been shot through the right temple. No gun was found. There were no powder marks on the skin. This led the pathologist to think that the range of fire was several feet or more. The decedent had a

recently blackened left eye. This observation, together with the absence of the gun and the absence of powder marks, stimulated the pathologist to tell the police that this seemed to be a clear case of homicidal shooting. He concluded that the dead man was in a fight in which he suffered a "black eye" and during which he was shot to death.

This opinion was subsequently found to be entirely incorrect; it is still resented by the district attorney and the police, and it is still a matter of embarrassment to the pathologist. The pathologist was not aware that subcutaneous ecchymosis in the orbital region frequently occur with gunshot injuries of the head, particularly those that involve the anterior fossa. He did not know that the contact between muzzle and skin in a suicidal injury by gunshot may be so perfect that no powder is deposited on the surface of the skin. He did not know that the teenage boy who visited the lavatory and found the dead man had pocketed the gun with the intention of telling no one about it. Obviously, he did not know that the decedent had written a suicide note to an ex-wife and put it in the mail an hour or so before he shot himself. In short, the pathologist made deductions that were not warranted by the evidence. He talked too much.

To the wrong people. The only persons who are entitled to information derived from the results of your investigation are the coroner, the district attorney, and the police. Never provide this sort of information to reporters unless you do so at the direction of the coroner or the district attorney. Be careful what you say in the presence of assistants in the autopsy room or employees of the undertaker. Such leaks of information are often the basis for unfounded suspicion of innocent persons or for the creation of unnecessary obstacles to the investigation by the police.

CONCLUSION

The almost complete exclusion from this discussion of the mistakes that are made in the interpretation of evidence has been deliberate. If evidence has been properly gathered and preserved, a mistake in interpretation may always be corrected. If the facts required for a correct interpretation are not preserved, the mistake is irreversible.

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