

Identifying the Cause - The Importance of the Post Mortem

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The forensic pathologist is no stranger to interrogation. There would be few however that would not have a distinct preference for the morgue and the process of interrogation at autopsy to being subjected to a testing of their published opinion as to cause of death in a criminal trial.

Although the forensic pathologist interrogates the cadaver as the silent witness, the primary skill set of observation, interpretation and disciplined deduction are shared with the cross examiner. The information that is gathered in the process of autopsy unfolds in the forensic process where we, as criminal lawyers, are confronted with understanding the pathology of violence - the essential nature of the enquiry into, and the distinction between, accident, suicide and homicide.

Just as the process of interrogation by cross examination does not commence in the courtroom, so the process of interrogation into the cause of death does not commence with the first incision into the first cavity at autopsy. Equally, it does not conclude when the autopsy is complete and the body is reconstructed for burial or cremation. It is well recognised that an appreciation of the scene from which the corpse was transported to the morgue is as critical in the reconstruction of the circumstances surrounding a suspicious death as it is to assist the pathologist to make optimum sense of the results of autopsy. Incomplete or oversimplified information, uncritically received by the pathologist from investigators, has the potential to skew the reasoning process and to seriously undermine the reliability of the opinion as to cause of death. So also may the mishandling of a body in the process of it being transported to the morgue have this effect. For example, the loss or overlaying of trace evidence on the outer skin or clothing of a deceased may misled the pathologist in his legitimate efforts to reconstruct the circumstances leading to death, in the same way that contamination from blood spillage during transport may misrepresent the extent and spread of secondary injury, or the dynamics of a struggle from which death resulted.

Dissection for medico-legal reasons was first performed of the University of Bologna in the thirteenth century where a chamber was outfitted with elevated benches grouped around to a single table centre of the floor to allow for the process of anatomical dissection to be witnessed by the assembled. It remains in situ today guarded over by a woman in black (sic). At this time it was the surgeon who was regarded as very much the inferior practitioner. He performed the dirty job of cutting with the much esteemed professor lecturing at a safe distance but within sight of the table so as to speak to what he was *seeing* as distinct from lecturing from received anatomical knowledge from the ancients.

Those responsible for individual autopsies at this time are reported as declaring at the end of the process:

"We have assured ourselves of the condition by the evidence of our own senses and by the anatomization of the parts"

The word autopsy itself derives from the Greek *autopsia*: seeing with one's eyes. The Autopsy Report issued out of the New South Wales Institute of Forensic science at Glebe carries the importance of observation into the preamble where the forensic pathologist certifying time, place and cause of death states as follows:

"In my opinion, based on what I have *observed myself*, my experience and training and the information supplied to me" (italics added).

The autopsy is the central part of the forensic pathology investigation generally where the basic aims of such an investigation have been described as follows:-

1. To discover, describe and record the pathological processes present in the deceased.
2. To relate these processes to the known medical history; to make conclusions about the causes and symptoms and signs observed in life; and then to make conclusions about the medical cause of death and factors contributing to death.
3. To contribute to the reconstruction of the circumstances surrounding death. Where these circumstances are important, or likely to be in dispute, this will require consideration of the scene of the death as well as the relevant autopsy observations, many of which may be of trivial medical consequence.
4. To describe and record the relevant observations and negative findings in the manner that will subsequently put another pathologist in the same position to assess these findings as the prosecutor. ²

While these are all important contributors to the forensic process, it is the fourth principle that is the most problematic in operation and the source of much disputation at trial.

As a lawyer being a witness to the photographic record of an autopsy is both unutterably confronting and very often confounding, irrespective of how many cases of homicide one has participated in. However, the methods by which we interrogate the evidence both before and at trial, and the discipline and inquiry that must accompany our treatment of forensic evidence whether as prosecuting or defence counsel, is as intimately linked with the pathologist's task at post mortem as it is different from it. At least a working understanding of applied anatomy and physiology, and an appreciation of what is involved at post mortem, is essential to a testing of a prosecution case theory. It also

enables defence lawyers to usefully solicit the opinion of an expert to challenge the case theory and the science that underpins it.³

While this is not the forum for a detailed analysis of the process of autopsy that process might in summary be staged as follows:

1. The receipt of the body at the morgue.

2. The external examination.

It is this stage in the process that a full photographic record is made both anteriorly and posteriorly of the body both clothed and unclothed. Close up shots of injuries or other sites of importance are taken regionally and fully measured (where appropriate) and described. The photographing of bruising and oedema is notoriously problematic (and potentially quite misleading) and therefore a full description (incorporating colour and size) should accompany the photographic record. The absence of bruising or laceration in areas likely to have been injured where violence was involved (or might have been involved) should also be the subject of specific report in appropriate cases. Equally as important is the examination of the surface of the body and the collection and labelling of foreign material found on the body. Fingernail scrapings have proved in recent experience to be a valuable source of DNA many years after death and following exhumation⁴. Radiography is especially sensitive where death is thought to have been associated with a shooting, thereby enabling the removal of the projectile by dissection with enhanced specificity. X-rays are also the optimum source of evidence of the direction and nature of impact where head injuries are sustained and, although they are likely to be observable after the skull is removed, a sighting of them on the x-ray transparency enables later and perhaps collaborative interpretation.

3. Internal examination.

Special techniques aside, and acknowledging a legitimate variation in the approach between pathologists, whatever the method used the process and order of incisions must be systematic and planned. Pleckhan and Cordner⁵ offer the view that the safest procedure, and one most likely to identify injuries of particular forensic interest while at the same time minimising artefact, commences with the first incision to the scalp behind the ear, passing through the temporal region to the same point behind the opposite ear following which the scalp is reflected to reveal the skull cap. The skull cap is thereafter removed providing for removal of the brain. The incisions behind the ears are continued down the antero-lateral aspects of the neck, across the mid clavicle to the midline just below the sternal notch. At the midline the incision continues down to the symphysis pubis. The skin of the neck is then reflected, at least to the mandible, to permit determination of the presence and accurate delineation of facial injuries. The skin of the chest and abdomen is also reflected to the subcutaneous plane to maximise the detection of bruises not otherwise observable externally. The perineum is then incised in the midline and the anterior abdominal musculature released so that the abdominal contents are exposed. The skin of the chest is also reflected and relevant musculature freed to

permit the exposure of the ribs, in turn permitting the cutting of the rib, the removal of the sternum and exposure of the heart and lungs.

Examination of the neck is of importance where head injuries are obvious and which have already been revealed when the brain was exposed or by x-ray. Similarly, where there has been a suggestion of asphyxiation by strangulation, or the application of other trauma to the neck, the thyroid bone and thyroid cartilage would need to be inspected following neck dissection.

Whatever method is used from amongst the various techniques available for removal of the internal organs, all organs must be weighed in grams and the weight recorded. The primary incisions should be clean and definite to expose the largest possible surface area of the organ being examined.

Any abnormality in the orientation and relationship of various organs to their neighbours should be noted and accurate descriptions made as to what is *actually seen*. All necessary specimens for laboratory and/or toxicological analysis should be collected, including histological and haematological examination of the sites of bruising.

The competent pathologist will be alert to the detection of post mortem artefacts, namely findings at autopsy which mimic ante mortem phenomena but which arise for the first time after death whether during the handling of the body and its transportation or the result of the autopsy procedure itself. Artefactual 'bruising' is commonly encountered and is susceptible to being misinterpreted as a product of pre mortem trauma. Similarly artefacts associated with putrefaction. Forcible disruption of rigor mortis (generalised muscular stiffening after death), and the artefacts resulting from efforts at resuscitation may give rise to a suspicion of ante mortem injury. This further underscores the importance of appropriate inquiries being made by the pathologist at autopsy of the method of transport of the corpse to the morgue, and the method by which it was handled en route, where the time of death has preceded the location of the corpse by any significant interval.

4. Body reconstruction.

5. Body release.

6. Documentation

The pathologist has the responsibility to report on the results of autopsy and to offer an opinion on both the direct and antecedent cause of death. A close and critical reading of the autopsy report, in conjunction with an examination of the photographic record, is essential to the legal process whether that be at inquest or at trial. Necessarily pathologists report their findings and their examinations idiosyncratically. This is not surprising given that each death is as isolated event and characterised by its own individual features. That said, uniformity in reporting, as well as uniformity in documentation and procedures, does permit of the type of open dialogue between experts that gainsays a better understanding of common ground between experts as well as highlighting substantive disagreement.

Finally, mention should be made of an aspect of the enquiry at post mortem, namely the fixing of the time of death (or more usefully where there is a post mortem interval of less than 24 hours, 'a bracket of probability' during which death occurred) ⁶. That question, and the method by which it is assessed by the pathologist, often has a direct bearing on the trial process giving rise as it does to issues of opportunity and alibi.

The time of death is a question invariably asked by police officers, sometimes with the touching faith in the accuracy of the estimate. However, determining the time of death is extremely difficult, and accuracy is impossible ⁷.

Time of death (otherwise known as the duration of the post mortem interval) and the sources of evidence and methodology used to calculate it are various. The acknowledged sources of evidence for estimating the time of death are three in number:

1. Corporeal evidence, ie that present in the body
2. Environmental and associated evidence, ie that present in the vicinity of the body and
3. Anamnestic, ie that based on the deceased's ordinary movements and day to day activities to the extent that they are known.

However no one source of evidence should be read to the exclusion of others.

The acknowledged methods for estimating the time of death are variously described as:

1. 'the rate method', eg, the amount and distribution of rigor mortis, the change in body temperature and the degree of putrefaction of the body and;
2. 'the concurrence method', where the occurrence of an event which took place at the known time is compared with the time of occurrence of the event under investigation, namely, death. For example, digestion of the last known meal⁸.

The interval between the sustaining of the injury that ultimately results in death and the pronouncing of death may be of equal importance in the trial process ⁹especially where the question at issue is the accused's opportunity to deliberately inflict injury as against the deceased's sustaining of injury accidentally.

A paper of this length can only scrape the surface of the skin of issues that present for criminal lawyers charged with the task of interpreting post mortem results and then interrogating them for the optimum articulation of a defence case or the presentation of a crown case. The use of the privately retained pathologist by the defence is a measure of the extent to which reasonable men of collective competence may disagree. Understanding the science in the context of legal principle and the burden of proof is the task that falls to us.

¹ King LC, Meehan MC A History of the Autopsy - A Review AM P Pathol: 1973:515-44
Quoted in Ethnicity, Legal Medicine and Forensic Pathology Vernon D. Plueckhahn and
Stephen M. Cordner Melbourne University Press 1991.

² Ibid at page 169. Note: The "prosecutor" in this context is the person actually performing
dissection as distinct from the party to a criminal trial.

³ This is by definition a subject so vast that it defies summary. There however are any
number of useful texts and publications. Grey's Anatomy and Butterworths Medical
Dictionary are primary references. See also the 'Virtual Autopsy' at the University of
Leicester website

⁴ The Inquest into the death of Sally Anne Huckstepp

⁵ ibid

⁶ Polson, Gee and knight, The Essentials of Forensic Medicine, 4th edition (1985) Pergamon
Press, Oxford

⁷ Knight, Legal Aspects of Medical Practice, Fourth Edition, (1987), Churchill Livingstone, Edinburg

⁸ For a comprehensive analysis of these method see "Postmortem Changes and the Time of
Death" Univeristy of Dundee web site Forensic Medicine

⁹ Johnathon Manley v R NSW Court of Criminal Appeal unrep 15/12/94

Kordner
[? Cordner]

'Deciding the Cause of Death after
the Nervous'.
(1993) The Lancet