



The Royal College of Pathologists

Guidelines on Autopsy Practice

Scenario 4: Autopsy for suspected acute anaphylaxis (includes anaphylactic shock and anaphylactic asthma)

Preamble

Anaphylaxis kills either by shock or asphyxia. These typically occur with no other signs of an allergic reaction. Consequently:

- anaphylactic shock is likely to be misdiagnosed as myocardial infarction.
Shock in hospital is usually rapid (median 5 minutes) and associated with arrhythmia and pre-existing cardiac disease. Outside hospital, it is typically slower (median 15 minutes), often with pulseless electrical activity and a healthy heart. Myocardial ischaemia is very probable (almost inevitable) in shock deaths, which may therefore be mistaken as primary myocardial infarction
- food and aspirin anaphylaxis are likely to be misdiagnosed as fatal asthma.
Asphyxia may be due to asthma (most common for food allergy or aspirin/NSAID sensitivity) or laryngeal oedema (most common for stings).

The role of the autopsy

To determine whether there is:

- morbid anatomical evidence to support the suspected anaphylaxis and its timing
- other pathological conditions that could account for death or contributed to death
- biochemical evidence of anaphylaxis
- serological evidence of the agent responsible for initiating anaphylaxis.

Pathology encountered at the autopsy

1. Often there is little or nothing specific to see, grossly or histopathologically.
2. There may be laryngeal (or pharyngeal, or other upper airway) oedema.
3. Pulmonary oedema, if present, may indicate epinephrine overdose.
4. If the patient was resuscitated, survived but then died in intensive care, many additional pathologies may supervene.

Specific health and safety aspects

None.

Clinical information relevant to the autopsy

- The complete medical notes, with statements from witnesses as to the final events at collapse.
- Any medication taken immediately prior to collapse.
- The complete drug schedule, with times and doses and routes of administration.

The autopsy procedure

- A complete autopsy examination.
- Careful search for bee stings if there is appropriate suspicion.

Specific significant organ systems

- Lung, larynx and airways examination for significant oedema (acute asthmatic death with airway remodelling of chronic asthma is typical of food anaphylaxis).
- Coronary arteries and heart for contributory ischaemic heart disease (myocardial ischaemia is an inevitable consequence of anaphylactic shock, even with normal coronary arteries).
- During coronary artery stenting, some patients may suffer allergic reaction to anti-clotting drugs or materials incorporated into the stent; this may also lead to local thrombosis from hypotension

Organ retention

None specific required.

Recommended blocks for histological examination – best practice

- Heart; note contraction band necrosis that may reflect inotropic resuscitation measures.
- Coronary artery.
- Lung with airways.
- Vocal cord mucosa.

Other samples required

- Urgently seek any pre-mortem blood specimens (in pathology laboratories) before they are discarded.
- Peripheral cadaveric blood, spun-down, for mast cell tryptase.
- Spun-down blood for specific drug antibodies and serum IgE levels.

The clinicopathological summary

1. Document:
 - the gross and histological findings
 - the blood mast cell tryptase
 - other serological investigations if done.
2. Decide whether:
 - the death was reasonably attributable to anaphylaxis and, if possible, which agent or drug was responsible
 - a raised blood mast cell tryptase truly indicates anaphylaxis in the case; discuss with a clinical immunologist
 - the death was caused by other natural or unnatural conditions
 - the cause of death is not ascertainable.

Specimen cause of death statements

- 1a. Anaphylactic shock
- 1b. Allergy to penicillin administered

References

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The RCPATH Working Party on the Autopsy

January 2005