



The Royal College of Pathologists

Guidelines on Autopsy Practice

Scenario 5: Maternal death

Updates made August 2005

1. Pathology encountered: Direct and Indirect maternal death lists of causes of death expanded.
2. Additional tissue sampling for specific genetic studies.

The role of the autopsy

To identify the pathologies in the patient and contribute critically to the clinicopathological evaluation of the death.

Pathology encountered at the autopsy

Deaths related to pregnancy are categorised into:

- direct – the disease is caused by being pregnant and/or delivering a baby
- indirect – a disease unrelated to pregnancy directly, but exacerbated by the physical aspects of pregnancy and/or delivery
- coincidental – a disease physically unrelated to pregnancy.

The major entities include the following.

- **Direct**
 1. Thrombosis and pulmonary thromboembolism
 2. Hypertensive disease of pregnancy (eclampsia, pre-eclampsia)
 3. HELLP syndrome (haemolysis, elevated liver enzymes, low platelets)
 4. Haemorrhage
 5. Thrombotic thrombocytopenic purpura-haemolytic uraemic syndrome
 6. Amniotic fluid embolism
 7. Early pregnancy deaths
 - a. Ectopic
 - b. Spontaneous miscarriage
 - c. Legal termination
 - d. Other (e.g. termination induced by non-medical personnel)
 8. Genital tract sepsis
 9. Other direct causes
 - a. Genital tract trauma
 - b. Fatty liver

10. Anaesthetic
11. Air embolism
12. Choriocarcinoma, hydatidiform mole
13. Ogilvie's syndrome (pseudo-obstruction of large bowel).

- **Indirect**

1. Cardiac
 - a. Congenital heart lesion with pulmonary hypertension
 - b. Acquired cardiac disease
2. Hypertension
3. Other cardiovascular
 - a. dissection of aorta
 - b. dissection of coronary artery
4. Psychiatric, including suicide related to pregnancy and delivery
5. Epilepsy
6. Malignant disease worsened by pregnancy (breast, cervix)
7. Other
 - a. HIV/AIDS
 - b. Sickle cell disease
 - c. Connective tissue disease
 - d. Diabetes mellitus
 - e. Any other significant clinicopathological condition.

- **Coincidental**

1. Death by own hands (suicide) if unrelated to pregnancy
2. Other malignant disease
3. Stroke (early in pregnancy)
4. Road accident
5. Homicide
6. Toxic/illicit drug overdose
7. Any other significant clinicopathological condition.

These deaths are further sub-classified into 'Early deaths' (up to 42 days following abortion, miscarriage or delivery) and 'Late deaths' (more than 42 days to one year following abortion, miscarriage or delivery).

Specific health and safety aspects

None, but note that the proportion of mothers in the UK who are HIV-infected is increasing.

Clinical information relevant to the autopsy

- All clinical information on past pregnancy history and present pregnancy is required.
- Clinical and drug information on pre-existing medical conditions.
- Family history of thromboembolism.
- The fetal/neonatal information is also relevant.
- The case should be discussed at the time and place of autopsy with the relevant obstetricians and clinicians, to establish the major problems.

The autopsy procedure

Full autopsy with the pathologist present at the evisceration.

Specific significant organ systems

- Heart – malformation; acquired disease, including hypertension; air embolism.
- Arterial system – aneurysms, aortic dissection.
- Lung – amniotic fluid embolism (high MW cytokeratin markers useful), thromboembolism, shock lung.
- Brain – haemorrhage and other strokes; consider Wernicke's encephalopathy.
- Uterus and genital tract:
 - particular attention to possible trauma
 - fallopian tube and ovary in cases of ectopic pregnancy.
- Placenta – standard examination.
- Bone marrow, femoral long bone, and spleen if sickle cell disease (see Scenario 2: 'Autopsy for sickle cell disease and sickle trait').

Organ retention

If trauma to the utero-cervix and pelvic area is a factor, consider retaining all the pelvic viscera for inspection by referee pathologists and clinicians.

Recommended minimum blocks for histological examination – best practice

- Lung, both.
- Heart.
- Liver.
- Kidney.
- Brain.
- Uterus.
- Placenta.

Other samples that may be required

- Blood culture for bacteraemia.
- Genital tract microbiology.
- Fresh tissue for genetic studies if aortic dissection (e.g. suspected Marfan's, Ehlers-Danlos syndromes).
- Review of the pathology of any previous surgical resection specimens of relevance to the pregnancy.

The clinicopathological summary

This must be comprehensive, to assist the clinical team, the Coroner (if a medicolegal autopsy), and CEMACH (Confidential Enquiry into Maternal and Child Health) in audit. It may be straightforward or complex; it may only be formulated after a multidisciplinary meeting with (for

example) the obstetrician, physician consultant for pregnancy, cardiologist, intensivist, anaesthetist and midwife/nursing team.

Decide whether the death is direct, indirect or coincidental in relation to the pregnancy.

Note that maternal death autopsy reports from the UK will be scrutinised by CEMACH.

Specimen cause of death opinions/statements

- 1a. Massive uterine haemorrhage
- 1b. Recent vaginal delivery at 40 weeks gestation

- 1a. Amniotic fluid embolism
- 1b. Caesarian section delivery at 38 weeks gestation on xx/xx/xx [insert date]

- 1a. Cardio-respiratory failure
- 1b. Lupus erythematosus lung disease
- 2. Pregnancy, delivered spontaneously at 28 weeks gestation

- 1a. Septic shock due to Group A Streptococcal infection
- 1b. Genital tract sepsis following delivery at term pregnancy

- 1a. Liver failure
- 1b. Fatty liver due to anti-retroviral therapy and pregnancy (35 weeks gestation)
- 2. HIV disease

- 1a. Pulmonary hypertension
- 1b. Congenital ventricular septal defect with reversed shunt
- 2. Caesarian section delivery at 34 weeks gestation on xx/xx/xx [insert date]

- 1a. Acute pulmonary hypertension
- 1b. Disseminated carcinoma of the lung
- 2. Recent delivery at term

References

- Millward-Sadler GH. Pathology of maternal deaths. In: Kirkham N, Shepherd N (editors). *Progress in Pathology, Volume 6*. pp. 163–185. London: Greenwich Medical Media Ltd, 2003.
- The Royal College of Obstetricians and Gynaecologists. *Why Mothers Die 1997–1999. Report from the Confidential Enquiries into Maternal Death in the UK*. London: RCOG Press, 2001. See chapter on Pathology.
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- Fox H. Pathology of maternal death. In: Fox H, Wells M (editors). *Haines & Taylor Obstetrical and Gynaecological Pathology (5th edition)*. Edinburgh: Churchill Livingstone, 2003. Chapter 47, pp.1559–1574.

The RCPATH Working Party on the Autopsy

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