HISTOLOGY IN FORENSIC PRACTICE

MR FINLAY FINLAY
WHERE HISTOLOGY FITS IN

Forensic investigation of a body

- External examination
- Gross internal examination
- Fluid analysis
- Imaging
- Genetic samples
- Tissue samples
OVERVIEW

This all feeds into the wider function of the forensic PM
- Confirm - in-life diagnoses
- Exclude – natural disease
- Uncover – unknown pathology
- Support – other evidence

What can histology do?
- Limitations of body fluid analysis to show chronic pathology
- Some disease processes are not clear at the gross tissue level
- 40% of cases reveal a cause of death at histology that is not visible grossly
- 8% of cases cause of death is only revealed by histology
- Half of cases have prior conditions revealed by histology
HISTOLOGY IN FORENSICS

- Larger tissue samples
- Type of tissue
- Urgency
- Procedure
COMPLICATING FACTORS

- Adipocere
- Decomposition/autolysis
- Mummification
- Predation
- Trauma
POST MORTEM OR ANTE MORTEM?
A TYPICAL YEAR

2017

• 2443 post mortems
• 1927 with histological investigation (79%)
• Roughly similar to the proportion requiring toxicology
• Toxicology and histology often vary in importance depending on type of case
CASE BREAKDOWN

- Natural
- Drug abuse
- Alcohol abuse
- Suicide
- Accident
- Undetermined
- Suspicious
- Medical related
- Industrial Disease
- Homicide
NATURAL CAUSES

Big 5 Killers
• Cancer
• Heart Disease
• Stroke
• Respiratory disease
• Liver disease
DRUG ABUSE
DRUGS
DRUG ABUSE: MICROORGANISMS
MICROORGANISMS
ALCOHOL ABUSE

Healthy | Fatty | Early cirrhosis | Advanced cirrhosis
ALCOHOL ABUSE

Healthy  Fatty  Early cirrhosis  Established cirrhosis
ALCOHOL ABUSE
ACCIDENT - TRAUMA
ACCIDENT - COLD
ACCIDENT AT WORK
MEDICAL RELATED
INDUSTRIAL DISEASE

Asbestos bodies
HOMICIDE AND SUSPICIOUS

Carotid artery tear
Histological observations on adipocere in human remains buried for 21 years at the Tomašica grave-site in Bosnia and Herzegovina

Adis Salihbegović*, John Clark², Nermin Saraflić¹, Svetlana Radović¹, Finlay Finlay⁴, Anes Iegunžić³, Imina Spahić³, Vedo Tuço³

¹Department of Forensic Medicine, Faculty of Medicine, University of Sarajevo, Sarajevo, Bosnia and Herzegovina, ²Formerly Department of Forensic Medicine and Science, School of Medicine, Dentistry & Nursing, University of Glasgow, Glasgow, UK, ³Department of Pathology, Faculty of Medicine, University of Sarajevo, Sarajevo, Bosnia and Herzegovina, ⁴Department of Forensic Medicine and Science, School of Medicine, Dentistry & Nursing, University of Glasgow, Glasgow, UK, ⁵Department of Forensic Medicine, Faculty of Medicine, University of Tuzla, Tuzla, Bosnia and Herzegovina

ABSTRACT

The Tomašica grave-site near Prijedor in the north of Bosnia is reported to be the largest primary mass grave discovered thus far relating to the 1992–95 war. A total of 275 complete bodies and 135 body parts were exhumed from it in 2013. Post-mortem examinations of the victims showed that nearly all had died from gunshot injuries but an additional striking feature was the degree of preservation of many of the bodies, even 21 years on, with skin, soft tissues and internal organs still present in abundance and gross structures clearly identifiable. Histology was performed on 68 samples of soft tissue from a total 13 bodies, on both skin and internal organs, and the degree of preservation was assessed in terms of the ability to recognize microscopic structure. Further comparison was made with samples taken a month or so later (56 tissue samples from 3 bodies, all but one different from the first group), after the bodies had been covered in salt as a means of general preservation. Generally, at a microscopic level, skin and subcutaneous tissues were better preserved than internal organs, while tissues sampled at the time of autopsy were better preserved than those sampled later.

KEY WORDS: Tomašica mass grave; adipocere histopathology

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BACKGROUND

- Tomašica mass grave, Bosnian men (and 3 women) from villages west of Prijedor
- Buried in a former iron ore mine in July 1992
- Grave disrupted in 1993 and many bodies moves to secondary mass grave
- Full exhumation late 2013 (21 years underground)
- 275 complete bodies, 125 body parts (293 individuals)
- Striking degree of preservation in some bodies
- Histology performed on 68 samples
GROSS PATHOLOGY
HISTOLOGY
SO, WHAT IS THE ROLE OF HISTOLOGY?

- Discover unknown pathology
- Histomorphological chronology of a disease
- Postmortem histological findings as evidence of an intravital event
- Confirm in-life diagnoses and legal notes
- Exclude natural disease from forensic cases
- Corroborate in-life and toxicological results
- Histomorphological determination of a timeline or aetiology