Improving strangulation diagnoses using micro-CT

Exploring the use of high-resolution scanning techniques to provide rigorous evidence in strangulation cases.

Key details

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Police region	West Midlands
Collaboration and partnership	West Midlands Police, West Midlands Surgical Training Centre.
Level of research	Professional/work based
Project start date	August 2015
Date due for completion	September 2024

Research context

Strangulation deaths are complicated to diagnose in forensic pathology practice, as the injuries encountered can be very subtle or not pathognomonic to strangulations.

Using high-resolution scanning of the victims' neck structures, which can contain micro-fractures, provides another source of evidence to increase the pathologists' confidence in the complete base of evidence.

The neck structures examined in such cases are delicate and small and standard methods can fail to detect subtle injuries.

Research methodology

Micro-CT (micro computed tomography) scanning produces high-resolution digital models of the internal structure of an object. This technology is used to visualise the internal neck structures of the larynx in cases of suspected strangulations.

The resolution of the scans shows micro-fractures of the laryngeal cartilages and bones. These are compared to a pool of previously acquired images of non-damaged larynges in order to detect injuries.

Further comparison to histological sections adds another level of robustness to the results of the micro-CT scans as injuries can be validated. This further allows to explore the limitations of the method, knowledge of which is an important aspect when using this evidence in a court of law.

Interim reports or publications

Baier W and others. (2019). Using histology to validate micro-CT findings of trauma in three post-mortem samples: First steps towards method validation. Forensic Science International. 297, pp27-34.