Forensic Pathology & Clinical Forensic Medicine

MACKLIN EFFECT IN HANGINGS ON POST MORTEM CT

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Hanging is the suspension of a person by a noose or ligature around the neck and is not an uncommon occurrence in everyday forensic work. With the evolving use of post mortem CT scans as an adjunct to post mortem examinations, there has been increasing speculation around the 'Macklin effect' and whether they occur more commonly in full or partial suspensions. The proposed Macklin effect results from rupture of terminal alveoli causing elevated intra-thoracic pressure with subsequent dissection of air into the mediastinal and cervical soft tissues and appears as air collections on the post mortem scan.

A review of over 100 neck compression/hanging cases at VIFM was conducted to determine the frequency and reliability of the Macklin effect in hangings.

CAN DENTAL CHARTING FROM A POST-MORTEM COMPUTED TOMOGRAPHICAL SCAN PRODUCE A CONFIDENT FORENSIC IDENTIFICATION WITHOUT TRADITIONAL PHYSICAL AND RADIOGRAPHIC EXAMINATION

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Dental comparison is internationally accepted as one of the primary scientific methods of identification of a deceased person or persons. With advances in modern technology the use of post-mortem computed tomography to aid forensic medicine and forensic odontology is on the increase. In this study we explore if odontologists with varying levels of experience in forensic odontology, and more specifically with charting from a multi-planar reformation, can extrapolate data of equivalent value from computer tomographic images as traditional radiographs. We also assess their confidence in their ability to formulate a valid opinion from this data alone. Australian odontologists were asked to complete a questionnaire which required dental charting from a variety of radiographic images and explored the practitioner's confidence in the records produced. Experience level had very little impact upon the confidence of charting from computed tomography images alone, especially in the presence of metallic restorations; however, the results of the survey indicate that currently practitioners are not confident in charting from a multi-planar reformation alone and that traditional physical and radiographic examinations are still indicated.

AN OVERVIEW OF ARTIFICIAL INTELLIGENCE/ DEEP LEARNING

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Artificial intelligence (AI) technologies have had increasing use in numerous medical and non-medical applications. Deep learning AI in particular is no longer a matter for research only and has been used in clinical practice applications in radiology and histopathology for years. Whilst radiology, photography and histopathology are large components of modern forensic pathology practice, AI image analysis and recognition technologies have not been used in forensic pathology to the same extent as they have in other medical specialties. This talk aims to provide an introductory explanation of AI and deep learning technologies. Additionally, this talk will discuss published research by the presenters on applications of deep learning technology to post mortem radiology, post mortem histology and macroscopic organ photographs, all conducted using freely available open-source software.

POTENTIAL FOR MINIMALLY INVASIVE RADIOLOGIC PROCEDURES IN CASES OF CULTURAL AND/OR FAMILY OBJECTION TO AUTOPSY

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It is considered conventional wisdom that 3-cavity post-mortem examination (+/- toxicology and postmortem CT) gives the most information in death investigation. However, coroners in New Zealand (and at least parts of Australia) have increasingly been required to take into account the wishes of next of kin regarding any objections to autopsies. Various groups, including indigenous populations, may be opposed to autopsy due to cultural, religious, or personal beliefs; and in such cases the coroner may direct a lesser post-mortem limited to external examination of the body.

Clinical radiology regularly utilises many image-guided, minimally invasive techniques for diagnostic or therapeutic purposes. This presentation looks at the potential of some of these techniques for cases where there is objection to full autopsy and a lesser post-mortem has been directed. Examples