

International Convention of Forensic Medicine and Sciences 2024: Maintaining Relevance Through Credibility and Continuous Advances, co-organised by Malaysian Society of Forensic Medicine and Science & Queen Elizabeth Hospital, Kota Kinabalu held on 3rd – 5th July 2024. Abstracts of plenary and paper (oral and poster) presented are as follows:

Plenary 1: Arrest-Phase Deaths in Custody: Restraint and Restraint-Related Deaths.

Alfredo E Walker

Forensic Pathologist & Coroner, Department of Pathology and Laboratory Medicine, Faculty of Medicine, University of Ottawa, Canada.

Restraint is employed in the practice of law enforcement to effect control of an individual to facilitate arrest. The appropriate restraint methods to be utilised must strike an acceptable balance between minimization of the risk of injury or death while maximising the effectiveness of achieving rapidity of control. There are two broad categories of restraint that can be employed: 1. Physical and 2. Chemical restraint. The modalities of physical restraint include: Use of implements (hand/leg cuffs/ligature, restraint suits, spit hoods, batons), Manual (prone position with without supplemental ligature application; neck holds or other methods to incapacitate), Firearms (standard weapons, impact rounds, Kevlar belts) and Conducting electrical devices (TASERS, stun guns). The utilisation of the physical restraint modalities can therefore involve: Application of handcuffs to the wrists (front/behind the body) and or ankles, Prone positioning of the body, Restraint of the extremities whilst in the prone position, Application of downward pressure on the decedent's back whilst he/she is prone positioned. Hogtied/hobbled position (prone maximal restraint position) and use of spit hoods. The chemical modalities of restraint can consist of: Use of lacrimal agents and chemical irritants (pepper spray, CS and CN gas) and the administration of sedative drugs (neuroleptics, benzodiazepines, ketamine). This presentation will review the normal physiology of human ventilation and breathing, discuss the utility of each of the above modalities of restraint which can be employed to by law enforcement to subdue persons during attempted arrest, and consider the pathophysiological effects of one or more of these modalities on the body of someone with an elevated body mass index from obesity, significant underlying stable heart and lung disease, and physically struggling against the application of significant amounts of force applied to the back of the torso, whilst actively restrained in the prone position in a psychotic state, in a state of intoxication of illicit narcotic drugs.

Plenary 2: The Forensic Pathology Investigative Approach to Suspected Fatal Child Abuse.

Alfredo E Walker

Forensic Pathologist & Coroner, Department of Pathology and Laboratory Medicine, Faculty of Medicine, University of Ottawa, Canada.

"The skin and bones tell a story that the child is either too young or too frightened to tell" Cameron, Johnson, and Camps 1966. Inflicted physical injury of an infant or child (abusive injury/ non-accidental injury) refers to injury/injuries sustained at the hands of a parent, guardian or caregiver of that infant or child in circumstances that exclude accident. The classical features were first described by Tardieu in 1860 but wide awareness of the problem is attributable to the 1946 publication by Caffey, American paediatric radiologist, who had described 6 infants with long bone fractures and subdural hemorrhage. Guthkelch (1971) was the first to invoke shaking as mechanism of abusive head injury. The medicolegal death investigation of any infant or children especially if injuries are suspected or discovered, must be undertaken by a multidisciplinary team of professionals, with each team member working to an agreed investigative protocol to ensure that all salient information about the case is obtained and documented for later consideration and review. In this regard, the post-mortem examination in these cases must follow a standardised protocol that must include full, systematized post-mortem imaging that must include full, systematized post-mortem imaging of all anatomical regions of the body (post-mortem skeletal survey) to ensure that all recent, healing or healed bony injuries are identified/flagged by the reporting radiologist for targeted excision and further examination by the forensic pathologist. This presentation will review the specific investigative and pathological protocols that must be adopted one is faced with an undifferentiated sudden unexpected death in infancy (SUDI) or childhood (SUDC) and the spectrum, nature, mechanisms of causation of cutaneous, visceral and bony injuries that can be encountered in cases of nonaccidental injury, how they should be worked up pathologically, to provide the correct answers to the medicolegal issues that arise in an individual case. "If the child cannot cruise, then it cannot bruise".

Plenary 13: International Medicolegal Death Investigation Systems: Evolution of the English Coroner's System – Death and Taxes.

Alfredo E Walker

Forensic Pathologist & Coroner, Department of Pathology and Laboratory Medicine, Faculty of Medicine, University of Ottawa, Canada.

Medicolegal death investigation (MLDI) is a modern-day umbrella term for a patchwork of highly varied state and local systems of death investigation. In a particular jurisdiction, MLDI is spearheaded by a medicolegal officer who is empowered with statutory authority to investigate certain categories of deaths which are defined in law. The responsible medicolegal officer will be either a coroner or medical examiner, dependent on the jurisdiction and its laws on death investigation. No matter which system is to establish the decedent's identity, date and time of death, place of death, cause, and manner of sudden death. Internationally, two main systems of medicolegal death investigation exist, the coroner's system and the medical examiner system, but in the USA, a minority of states/counties utilise a third system which is a hybrid of the two main systems i.e. Medical Examiner/Coroner (ME/C system). The coroner's system was derived from the English Coroner's System which is the oldest surviving judicial office in England and Wales that originated in the 12th century, it is mainly practised in territories which are former British colonies. In these jurisdictions, the criteria/requirements to undertake the role of coroner are highly variable and range from qualified professionals (lawyers, medical doctors, nurses) to lay persons. The medical examiner's system evolved from the English Coroner's System in the USA and is referred to as the US Medical Examiner (USME) System. In the USME system, the medical examiner is a forensic pathologist (medical doctor with postgraduate training/certification in forensic pathology), who leads the medicolegal death investigation process. The English Coroner (Custos Placitorum Coronas – the Keeper of the Pleas of the Crown), was established in 1194 by King Richard I, a poor Norman king, to investigate sudden deaths from both judicial and financial perspective, that included the imposition of a financial penalty (murdrum fine) on the local district whenever a body was discovered and it could not be proven by local community that it was a Norman who had been unlawfully killed by a Saxon. The murdrum fine was originally imposed by William the Conqueror as a means of protecting Normans from Saxons. On discovery of a dead body, the English coroner would be informed, ride to the location of the body, gather a jury of men on the presumption that a Norman had been unlawfully killed by a Saxon (presumption of Normandy) and impose the murdrum fine on the local community unless the local community could prove that the decedent was a Saxon. Therefore, the original English coroner was a medieval tax collector for the Crown who investigated death. Since its origin over eight centuries ago, role of the English coroner has adapted from being a medieval tax collector who investigates sudden, unexpected, violent, or otherwise unnatural death. Although the duties of the modern-day coroner in England and Wales was initially defined in law in 1194 AD in the Articles of Eyre under King Richard I, the current role is governed by many statutes and amendments (Coroner's Rule 1984, Coroner's Act 1988, Coroner's (Amendment) Act 2005 and the Coroner and Justice Act 2009) since 1275 AD. This presentation will review the origin of the English Coroner System, its evolution into two main medicolegal death investigation systems used internationally, the criteria, requirements, and professional qualifications for each role, the functional differences of both systems and the advantages/disadvantages of each system.

Plenary 4: Questions and Traps in Court.

Roger Byard

Senior Specialist Forensic Pathologist, University of Adelaide, Adelaide, Australia.

Court systems differ considerably among countries and often between jurisdictions. In South Australia the court system is adversarial with the courts playing the role of an impartial referee between the prosecution and defense. The three state courts dealing with criminal matters are the Magistrates Court, the District Court and the Supreme Court. The Coroners Court differs in that it follows an inquisitorial model with the court actively involved in determining the facts of the case. The State Coroner is a lawyer and judicial officer. Presenting evidence in court may be a difficult process for forensic pathologists and scientists as they may be unfamiliar with both the environment and the rules of evidence. Expert witnesses are, however, able to give their opinions on matters pertinent to the case. Issues to be discussed will involve how to deal with lawyers attempting to put limitations on biological processes that are a continuum, the use of legal language rather than medical terminology, the degree of force involved, the length of possible survival, and the age of an injury. Also, the way to deal with the very lengthy question containing several potentially confusing double negatives and the breaking down of complex issues into multiple component parts will be examined. Forensic experts are the experts to the court and should not express partisan opinions.

Plenary 5: Coroner System in UK.

Chandroth Navin A/L Pankajakshan

Forensic Pathologist, Department of Forensic Medicine, Pulau Pinang Hospital, Malaysia.

The office of the coroner in the United Kingdom is one that is almost 1000 years old. Steeped in history, one would be forgiven for being left unaware that its foundation was initially attributed to tax collection. The current coroner system, however, is a judicial one. The 'UK coroner system' is a partial misnomer as the system is unique to England and Wales. Similar systems are in place in other parts of the UK, with the Northern Ireland coroners having more in common with their English and

Welsh counterparts, while the Scottish Procurator Fiscal system is significantly different. Essentially, the coronial system being an inquisitorial one, aims to answer the who, why, where, when and how questions relating to an individual(s) death.

Plenary 6: Coroner System and Postgraduate Training (Forensic Pathology) in Singapore.

Lee Chin Thye

Senior Consultant Forensic Pathologist, Health Sciences Authority (HSA), Singapore.

The Coroners Act 2010 was passed by Parliament on 19th May 2010 and came into effect on 2 January 2011. The Act replaced relevant provisions in the Criminal Procedure Code and shifted the focus of the coroner system from fault-finding to fact-finding. The Act also introduced a duty to report certain types of deaths (known as “reportable deaths”) and the provisions to facilitate the coronial investigations including appointment of forensic pathologists, their powers and the performance of postmortem examinations. This presentation will cover relevant provisions under the ambit of the Coroners Act for forensic pathologists of the Forensic Medicine Division, Health Sciences Authority to assist the coroner and the significant amendments made since the introduction of the Act. The second part of the presentation will cover postgraduate specialist training for forensic pathologists in Singapore from the perspective of a trainee and a trainer, and the future challenges.

Plenary 7: Coroner System in Malaysia.

Mohd Suhani Bin Mohd Noor

Senior Consultant Forensic Pathologist, Sultanah Bahiyah Hospital, Kedah, Malaysia.

The medicolegal death investigation system in Malaysia is derived from the English common law system of coronial inquests. Instead of a coroners act, procedures for death investigation in Malaysia are provided as special proceedings under Chapter XXXII of the Criminal Procedure Code (CPC) that originated in the CPC enacted for the Malay States in 1900 during British colonization. Since the CPC for the Federated Malay States was enacted in 1935, the major provisions on death inquiries under Chapter XXXII have remained essentially unchanged. Chapter XXXII provides for a modified coroner system where a magistrate who acts as a coroner conducts a death inquest in a Magistrate Court. Following a practice direction in 2014, Coroner’s Courts were finally established in Malaysia, presided by coroners appointed from amongst session’s court judges. However, as the CPC does not provide the coroner with a more investigative or supervisory role following the discovery of a death, the coroner still depends on the police to investigate. This paper will give an overview of the medicolegal death investigation in Malaysia and how the legal provisions have shaped the practice of forensic pathology in the country.

Plenary 8: Anomalous Origin of the Coronary Arteries: Current Developments.

Mary Sheppard

Professor of Cardiac Pathology, St George’s Medical School, London, UK.

5% of sudden cardiac deaths (SCD) are due to coronary artery anomalies (AOCA). It is often reported in sports associated with exertion and USA study report it as high as 13%. Only 20 of the 50 patients (40%) in our series experienced cardiac symptoms such as syncope, chest pain on exertion or breathlessness before their SCD. Twelve of the patients (24%) died during or immediately after physical exertion. In our study the mean age was 28 ± 16 years and 23 individuals were male (77%). In 8 cases (27%), SCD occurred before 18 years of age. Cardiac symptoms were present in 11 individuals (37%), and syncope was the most common ($n = 6$, 20%). Anomalous left coronary artery arising from the right sinus of Valsalva (ALCA) with interarterial course ($n = 11$) and anomalous right coronary artery arising from the left sinus of Valsalva (ARCA) with interarterial course ($n = 11$) are the most common types found. ALCA arising from pulmonary artery (ALCAPA) was present in 7 cases. Left ventricular fibrosis is reported and is mainly subendocardial. Death occurred during exercise or emotional stress in 15 (50%) cases. The AOCA variant where death occurred more frequently during physical activity was ALCA (8 of 11, 73%), followed by ALCA arising from pulmonary artery (4 of 7, 57%) and ARCA (2 of 11, 18%). AOCA is a rare cause of SCD. ALCA and ARCA with interarterial course are the most common anatomical variants in SCD victims. ALCA is more commonly associated with death during exercise. Cardiac arrhythmias causing sudden death seem most likely in the cases without overt myocardial damage in most cases.

Plenary 9: Aetiology of Sudden Death in Sport: A Histopathologist Perspective.

Mary Sheppard

Professor of Cardiac Pathology, St George’s Medical School, London, UK.

Sudden cardiac death (SCD) in young competitive athletes (<35 years old) is a tragic event that receives widespread media attention. The majority of deaths in athletes are due to underlying cardiovascular disease which is often not diagnosed during life. It is now apparent that death is not due to ischaemic heart disease but diseases of the heart muscle, the cardiomyopathies, the electrical channelopathies and valvular heart disease. Most sudden death in athletes over the age of 35 is due to coronary artery atheroma while in those under 35 it is sudden arrhythmic death with morphologically normal heart and cardiomyopathies.

Males predominate and female death is rarer. Main cardiomyopathy is arrhythmogenic cardiomyopathy and hypertrophic cardiomyopathy but idiopathic left ventricular cardiomyopathy is becoming more prevalent. Commotio cordis and coronary artery anomalies as well as coronary spasm are rarer causes. An autopsy with full examination is essential in all cases to explain the death. We need a registry of all sport-related sudden cardiac deaths.

Plenary 10: Sudden Death Syndrome and Other Non-ischemic Causes of Sudden Death.

Mary Sheppard

Professor of Cardiac Pathology, St George's Medical School, London, UK.

Sudden cardiac death (SCD) is defined as natural unexpected death in witnessed cases as an acute change in cardiovascular status with time to death being <1 hour and in unwitnessed cases as person last seen alive <24 hours before being found dead. The almost universal decline in hospital autopsies has led to significant errors in the cause of death. Within Europe, up to 40% of SCD in people under 50 years cases did not have an autopsy. In the United Kingdom, we have a high autopsy rate within our coronial system. It is especially important that SCD in younger people is investigated with autopsy as genetic cardiac causes including channelopathies and cardiomyopathies are more frequent which have important implications for their families. This highlights that there is still a role for the autopsy in the 21st century in determining the cause of sudden cardiac death which guides future public health planning and prevention. Predominant entities causing SCD are sudden arrhythmic death syndrome and cardiomyopathies. We have developed a national programme for genetic testing and family cardiological screening in the UK.

Plenary 11: BSL 4 and Sharing Experiences.

Lee Chin Thye

Senior Consultant Forensic Pathologist, Health Sciences Authority (HSA), Singapore.

Since the SARS Outbreak in 2003, the Forensic Medicine Division (FMD), Health Sciences Authority began to develop a high-level biosafety containment facility to safely perform autopsies in highly infectious cases. The result is a unique mobile containerised biosafety level 4 (BSL-4) autopsy suite. Staff are specially trained to be able to perform the correct procedures for entry and exit, body handling and emergency response scenarios to allow the safe handling of infectious cases and protect the community from an outbreak. Regular training exercises maintain user competencies. During the COVID-19 pandemic, the BSL-4 facility allowed FMD staff to safely operate on suspected/confirmed cases with confidence.

Plenary 12: Experience with PMCT in Singapore.

Lee Chin Thye

Senior Consultant Forensic Pathologist, Health Sciences Authority (HSA), Singapore.

Postmortem computed tomography (PMCT) was introduced as an imaging modality in the Forensic Medicine Division, Health Sciences Authority more than 10 years ago. The PMCT scanner is on-site and used only in the postmortem setting. Since then, it has become a mainstay of the mortuary operations, providing the professional and technical staff alike with information such as potential hazards and possible diagnoses. All coroner's cases in Singapore now undergo PMCT scanning, which is used both as triage tool for evaluation of coroner's cases and as an adjunct to postmortem examinations.

Plenary 13: Forensic Odontology & OSCC in MOH: Expansion of Service.

Norhayati Binti Jaafar

Head of Service & Consultant Forensic Odontology Specialist, Kuala Lumpur Hospital, Malaysia.

Forensic odontology service in MOH started back in 2009 and purely on post-mortem cases as it was only a two-person team mostly. In 2013, the forensic odontology unit in Hospital Kuala Lumpur expanded into a five-person team and eventually to eight in 2018. We started doing on call for One Stop Crisis Centre (OSCC) Unit under the Emergency & Trauma Department in Hospital Kuala Lumpur in 2019 and managing the referred cases related to oral as well as bite mark injuries. In 2021, I was subpoenaed to the court for one OSCC case that I managed the previous year. In the court, I was asked on the technical part of the existing OSCC guideline that was published by MOH in 2015, whereby no involvement on dental personnel was mentioned in the guideline and yet I managed the case. Based on this incident, we brought this issue up to Bahagian Perkembangan Perubatan KKM and they agreed to include oral sexual assault as new topic in the new revised OSCC guideline. In this presentation, the new guideline will be shared with the participants and the impact of this guideline to the MOH dental fraternity in Malaysia will also be discussed.

Plenary 14: Orofacial Injuries in the Context of Family Violence Homicide in Victoria: A Forensic and Epidemiologic Approach.

Richard Bassed

Senior Forensic Odontologist and Coordinator of Identification Services, Deputy Director and Head of Academic Programs at the Victoria Institute of Forensic Medicine, Melbourne, Australia.

Domestic violence refers to an act of violence that occurs between people who have, or have had, an intimate relationship; family violence (FV) being an expanded term encompassing a variety of kinship. FV encompasses child abuse, partner violence, and elder abuse. Family violence homicide (FVH), the tragic endpoint of FV, is a complex and compelling public health issue in Australia and globally, warranting both epidemiological and forensic approaches. Oro-Facial injuries are often associated with family violence. The study of injury patterns in inflicted violence informs medicolegal and policy outcomes as well as practitioner training and professional responses to family violence. Abused victims exhibit a constellation of orofacial injuries, ranging from oral hard and soft tissue injuries, bite marks, pharyngeal injuries in children inflicted by caregivers, oral warts, gonorrhea, and dental neglect manifested as a high incidence of untreated tooth decay, gingivitis and other periodontal conditions. This talk addresses FVH in the broader FV context, with a major focus on orofacial injuries and will discuss the patterns of orofacial injuries in FVH in the Victorian, Australia, population, including risk factors and epidemiologic trends. Knowledge of the reigning trends and patterns of orofacial injuries in FV enhances population-based evidence informative to health providers and policy makers.

Plenary 15: Application of Advanced Analytic Technology in Forensic Medicine.

Richard Bassed

Senior Forensic Odontologist and Coordinator of Identification Services, Deputy Director and Head of Academic Programs at the Victoria Institute of Forensic Medicine, Melbourne, Australia.

Traditional research methods are sometimes unable to provide evidence-based answers to many questions of forensic significance. For example, it is not possible to conduct clinical trials to study blunt force injury characteristics and causation. Recent advances in analytic technology, including artificial intelligence, machine learning, and augmented/virtual reality, are providing us with new ways to analyse data which may provide answers to that which is currently unanswerable. This technology may provide the capacity to expand cause of death determination through imaging alone and may assist in injury interpretation (bruise ageing, ballistics), identification (DVI), anatomical reconstruction (ballistics), and in population based pattern recognition analysis for public safety. This talk will discuss current projects being conducted at Monash University and the Victorian Institute of Forensic Medicine, and will also touch on some of the potential risks associated with the development of this technology.

Plenary 16: Dating of Bruises - Updates.

Roger Byard

Senior Specialist Forensic Pathologist, University of Adelaide, Adelaide, Australia.

Bruises in the skin and subcutaneous tissues represent areas of extravasation of blood due to blunt force injury. Compromise of the integrity of blood vessel walls and blood pressure is generally required for their formation. Forensically the most useful bruises are those with a patterned appearance that matches the morphology of the impacting object. Medicolegal issues that arise in the evaluation of bruises include their age, the amount of force used, and whether they occurred before or after death. It is now recognised, however, that forensic assessments, particularly of the age of bruises, may be less reliable than previously considered. Topics to be discussed include the unreliability of macroscopic and microscopic assessments in terms of age, reasons for histological variability, the significance of unexplained bruises in the very young, and reasons for minimal skin bruising in the face of significant internal injuries (Casper's sign). Great variations in individual bruising responses to blunt trauma occur related to differences in the nature of the impacting object and forces, variations in subcutaneous tissue thickness, variability in bleeding tendencies, the effects of underlying disease states, age of the victim, the influence of medications (both pharmaceutical and herbal), and background skin pigmentation. In summary, less confidence should be expressed when it comes to trying to date and assess bruises.

Plenary 17: Experience in Histology Laboratories in VIFM.

Ismadi Bin Ismail

Scientific Officer, Department of Forensic Medicine, Sultanah Bahiyah Hospital, Kedah, Malaysia.

Privileged to be one of the Forensic Scientific Officers selected to attend a short course at the Histopathology Laboratory in VIFM, I am glad to be sharing my valuable experience abroad that has given me a new outlook on the management of a Forensic Histopathology Laboratory.

In VIFM, the histopathology laboratory is equally as important, if not more, as compared to the toxicology, PCR analysis and extraction laboratories. The primary function of this section aims to provide support to the institute's Pathologists

and Registrars by processing, sectioning and staining the slides, as quickly as possible within the turn-around-time, with quality of the produced slides at its forefront. There were four main workstations in this laboratory comprising of the main administrative office, main laboratory work area, the grossing & processing room and finally the storage unit for both slides and blocks. This laboratory is managed by 4 personnel inclusive of 1 laboratory manager, 2 scientific officers and 1 laboratory technologist. This program has had a positive impact on my service thus far and is recommended to be continued in the future to enhance the quality of other scientific officers.

ABSTRACTS OF ORAL PRESENTATION

Discriminant Models for Sex Estimation from Maximum Cranial Length and Breadth in a Malaysian Population.

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The skull is widely considered the second-best indicator of sex, with an accepted notion that the cranium of a male is larger than a female. The aim of this study was to construct sex estimation discriminant models from Malaysian crania, an extension from our previous work of Hisham and Ibrahim (2022). The sample comprised multi-detector computed tomography cranial scans of 1.0 mm resolution of 300 individuals equally distributed by sex and ethnicity. Maximum cranial length (GOL) and breadth (XCB) were obtained from these images. Data were analysed using descriptive statistics and discriminant function analysis. The measurements taken from the images were highly precise, with TEM = 0.416–0.789, rTEM = 1.42–5.0%, R = 0.750–0.904. Mean values ($\pm$ SD) in cm for GOL in males and females are 18.036 ± 0.478 and 17.045 ± 2.418 , respectively, while their XCB are 14.302 ± 0.347 and 13.775 ± 1.695 . A multivariate sex estimation model was developed: Sex = (GOL*1.277) + (XCB*7.42) + (-32.937); with a sectioning point of 1.438 and sex bias of -5.3%. Cross-validated linear discriminant analysis obtained 77.3% accuracy (albeit lower accuracy rates for single variable models: 74% for GOL and 65.3% for XCB). The produced sex discriminant models can be used to offer insights for sex estimation in our local forensic practice.

Forensic Study of Drowning Deaths in Rivers Viewed From The Aspect of Glucose Metabolism.

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Introduction: During drowning, the brain encounters a major challenge from hypoxia. In the absence of oxygen, brain cells transition from aerobic to anaerobic metabolism to produce energy. Lactate Dehydrogenase (LDH) is an enzyme that converts pyruvate to lactate during anaerobic glycolysis. LDH levels rise during hypoxia due to increased anaerobic glycolysis. Meanwhile, earlier research has indicated a link between the amount of time they drown and glucose levels. The relationship between drowning in rivers and glucose metabolism is not well understood. **Aim:** The purpose of this study was to explain glucose metabolism during drowning, which is linked to LDH enzyme activity as a sign of hypoxia, as well as glucose metabolism measures such as blood glucose and muscle glycogen levels. **Materials and Methods:** This was a laboratory experiment without randomization, using a quasi-posttest-only design with a control group. This study included 30 white mice divided into one control group and four treatment groups. **Results:** Two variables decreased and one variable increased. Over the course of 120 minutes, the glucose and muscle glycogen content declined from 93.86 and 414.84 to 78.69 and 281.84, respectively. Following 120 minutes of immersion, the LDH concentration increased from 220 to 481. **Discussion/Conclusion:** LDH is an enzyme that participates in anaerobic glycolysis. LDH levels are affected by a variety of parameters, including tissue type, oxygen availability, redox status, cellular demand, individual variability, and metabolic adaptations. To summarize, hypoxia during drowning increases LDH levels while decreasing glucose and glycogen levels in the body.

A Study on Viability of SARS-CoV-2 in Cadavers in Relation to Postmortem Interval.

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Introduction: As of April 2024, 7942 nationwide deaths involving SARS-CoV-2 were brought in dead (BID). Covid-19 autopsy is the gold standard for determining the cause of death for BID cases. One of the greatest challenges during Covid-19 body handling and autopsy is the possible transmission of the virus from cadavers. No study has yet addressed on the infectivity rate of SARS-CoV-2 in cadavers. **Objectives:** A study was conducted in Forensic Department of Hospital Sultanah Bahiyah to study on the viability thus the infectivity rate of SARS-CoV-2 in cadavers. The study as well was to analyse the demographic profile, CT value of tissue samples (Lungs and Heart), variants of SARS-CoV-2, vaccination status and comorbidities on their significance to SARS-CoV-2 viability rate. **Materials and Method:** An ambidirectional cohort study was conducted from January 2021 till May 2023. Tissue samples for lung and heart viral cultures obtained from 227

cadavers to study on the viability rate. The other data were obtained from death registry record. Kaplan-Meier survival analysis method and Cox regression method were used for data analysis. *Results:* Viability rate was 86 to 95% in the first 12 hours of postmortem interval. Chronic obstructive airway disease (COAD), Omicron variant and vaccinated individuals showed significant relationship (p -value < 0.05) with the viability rate. *Discussion:* Biohazard safety measures in aerosol generating procedures to be strictly followed as the viability rate of SARS-CoV-2 was very high during the first 12 hours after a person died. Public health measures need to strengthen as deceased with COAD and not vaccinated showed increase in the viability rate

The Morphologic Spectrum of Aspiration Pneumonia in Infancy.

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Introduction: Aspiration pneumonia remains a significant cause of death among the population at risk, particularly in the paediatric age group. This case series aims to highlight the spectrum of findings seen grossly at autopsy as well microscopically and ultimately shedding light on the diverse findings associated with this lethal condition. *Cases:* We discuss three paediatric cases of aspiration pneumonia with similar presentation but contrasting findings at autopsy and histopathology. In two cases, the decedents were 6 months old and had just started weaning diet while the third infant was eight-month-old. They presented with a short history of fever with episodes of vomiting prior to demise. At autopsy, the decedents had weights and growth parameters above the 3rd centiles and showed neither injuries nor features of dysmorphism. No congenital deformities were detected externally. Internal examination findings in the first case showed curd-like content within the airways that resembled the stomach content. The lungs showed reddish patches in the parenchyma upon sectioning. Conversely, the airways of the second case contained a pasty blackish material that did not match the stomach contents while the lungs had multiple haemorrhagic foci on the pleural surface with blackish discolouration and apparent necrotic areas on sectioning. The third case showed insignificant airway findings with almost normal-looking lung parenchyma. Microscopic examination of the lungs in all three cases showed food particles and bile pigmentation, in different distributions and various inflammatory cellular responses. *Discussion:* Comprehensive histopathological analysis of this case series and comparison with known literature on aspiration pneumonia can provide valuable insight into the range of its morphological findings for the benefit of both pathologists and clinicians.

Exploring Maxillary Sinus for Forensic Identification: A Review of Sinus Parameters and Measurement Techniques.

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Introduction: Forensic odontology plays a critical role in identification processes within forensic science. Central to this discipline is the comparison of unique dental and craniofacial features. Radiographic images of the maxillary sinus offer significant insights due to their distinct parameters, such as linear dimensions, volume, and morphology, which are essential for comparative dental analysis. *Objective:* This study reviews original research focused on the diverse parameters of the maxillary sinus used in forensic identification. It encompasses an analysis of both two-dimensional and three-dimensional imaging modalities. *Materials and methods:* A methodical literature search adhering to PRISMA guidelines was conducted across Scopus and PubMed databases using the keywords “maxillary sinus,” “parameters,” and “identification.” The search included complete papers of original research without time restrictions. Papers that did not meet the conceptual framework, reviews, case studies, secondary sources, and letters to the editor were excluded. *Results:* The review identified 20 articles, with the vast majority (95%) examining metric measurements of the maxillary sinus, including aspects such as height, width, depth, volume, inter-sinus distances, and angles. Only a single study addressed morphometric parameters such as septa, pneumatization, and sinus scalloping. Predominantly, studies utilised three-dimensional imaging techniques like CT scans and CBCT, emphasising profiling over comparative analysis, which constituted only 5% of the research. *Conclusion:* Despite extensive exploration of the maxillary sinus for human identification, there is a notable deficiency in studies focused on its morphological features. This gap underscores a significant oversight in qualitative analysis, which could provide unique and essential features for forensic comparison.

Forensic Identification of Skeletal Human Remains in Indonesia – A Case Report.

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Introduction: Identifying human remains is critical in forensic anthropology and medicine, serving legal and humanitarian purposes. According to the Indonesian Law of Health, the identification of human remains is a mandatory process for unidentified bodies. **Case Report:** The police brought in a highly advanced, decomposed human skeleton found inside an empty house in Jakarta, Indonesia. The skeletal remains were nearly complete except for the small bones of the hands and feet, which were missing. Upon examination, the skull bones showed a brachycephalic head shape and a highly curved lambdoid suture for Mongoloid Race. The cranial sutures were partially fused with a Meindl-Lovejoy score of 5 for age estimation between 28 and 52 years old. The pelvis exhibited an android pelvic inlet, an acute subpubic arch, and a narrower sciatic notch corresponding to male features. The femur length was 44 cm; hence, the estimated stature is between 163 and 171 cm using the Trotter Glesser formula for male Mongoloid. Specific identifier characteristic was found, including a callus on the proximal left radius bone, indicating a history of an old fracture. The estimated general PMI for skeletonization is within a few months to a few years in Indonesia. However, various factors can influence this timeline, and the actual decomposition rate can vary depending on specific circumstances. **Conclusion:** Using a combination of several identification methods increases the likelihood of accurate identification, provides closure to families, and assists law enforcement in criminal investigations.

Aviation Accidents and Its Role in CAAM Reporting.

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Introduction: Malaysia has been shocked by the dreadful news of aviation accidents. There were 26 aviation accidents with 12 fatalities between 2022 and 2023. Among the 12 fatalities, 2 of them occurred in Perak. Aircraft accidents are uncommon; however, it is one of the common scenarios that cause mass fatalities. This case report aimed to analyse the injuries sustained by pilots in light aircraft accidents and their role in the Civil Aviation Authority of Malaysia (CAAM) reporting. **Case report:** Case 1 A fixed-wing Piper Warrior II (P A28-161) aircraft with two crews crashed landed into a water diversion culvert 3 minutes after take-off. Both pilots were immediately sent to casualty, however, the Right-Hand Seat (RHS) pilot was pronounced dead on arrival. Autopsy revealed injuries severe enough to cause almost instantaneous death and CAAM's official report concurred with the findings. Case 2 A Eurocopter (EC120B) with one occupant vanished from the air traffic control radar after a significant drop in altitude. The wreckage of the aircraft was discovered in a forest reserve. The pilot was certified dead at the scene. The autopsy revealed injuries severe enough to cause almost instantaneous death. However, CAAM's reporting states otherwise. **Conclusion:** There were discrepancies in the CAAM reporting with the postmortem findings result. The resulting discrepancy is likely due to the different agencies working in isolation, thus, there is a need for the authorities of CAAM reporting to work hand in hand with the forensic team to produce scientific non-biased base evidence reporting of aircraft incidents in the near future.

The Characteristic of Sexual Violence Cases in Indonesia's Cipto Mangunkusumo National Hospital During 2021-2023.

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Introduction: Clinical forensic medicine deals with provision of forensic medical services for living people as an effort to uphold justice. One of its main fields is to comprise examinations of victims and/or perpetrators in sexual violence cases. Data from The Ministry of Women's Empowerment and Children Protection in Indonesia showed that 43% of the cases reported in the year 2023 were sexual violence cases. **Objectives:** The purpose of this study was to determine the characteristics of sexual violence cases examined in Cipto Mangunkusumo Hospital (CMNH) during January 2021 until December 2023. **Method:** This study is a descriptive cross-sectional study using secondary data from the forensic and medicolegal unit in CMNH during January 2021 until December 2023. **Result:** The result of this study showed clinical forensic medicine cases examined in RSCM from January 2021 to December 2023 totalled in 2546 cases, with 22.1% (n=563) cases were related with sexual violence. The cases examined in 2021 (n=151), 2022 (n=194) and 2023 (n=218). The types of cases varied, from child sexual abuse, sexual abuse, suspected adultery and abortions. Not all cases examined was accompanied by a police inquest. **Discussion and Conclusion:** Indonesia has issued a Sexual Violence Crime Law as an effort to prevent and handle sexual violence cases, though some would argue the effectiveness of this regulation in its implementation. A rise in cases examined might be caused by its awareness. Hence, addressing sexual violence requires cooperation from diverse sectors, including health, education, welfare and criminal justice.

Applicability of London Atlas of Tooth Development and Eruption for Dental Age Estimation in Children of the Malaysian Population Using maxillofacial Imaging.

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Introduction: In forensics, dental age estimation is crucial, and literature has many methods for estimating dental age. London Atlas of Human Tooth Development and eruption method was developed on British and Bangladeshi populations in 2010. Despite its universal acceptance and reliability, the method has not yet been extensively tested on Malaysian children. This research aimed to test the applicability of The London Atlas of human tooth development and eruption in children of the Malaysian population aged 4 to 16.99 years old. **Method:** This study utilised the London Atlas software for dental age estimation, focusing on the right mandible and maxilla, occasionally incorporating the left side. Intraclass correlation (ICC) and Cohen's Kappa assessed reliability, with the principal author and a forensic odontologist re-evaluating a subset. Paired t-tests compared chronological and estimated dental age, with one-way ANOVA's F-tests evaluating discrepancies' significance. IBM SPSS Statistics facilitated analysis. **Result:** The study included 529 radiographs (279 males, 244 females), showing good intra- (ICC = 0.992) and inter-examiner (ICC = 0.976) reliability. Mean chronological age (CA) and estimated age (EA) showed non-significant gender differences. However, age group analysis revealed significant CA and EA distinctions, with some alignment in certain groups. Approximately 87.95% were estimated within ± 1 year of CA, indicating high reliability despite gender-based variations. Comparing CA and EA showed minimal difference, confirming the London Atlas method's accuracy for both genders. **Conclusion:** The London Atlas of human tooth development and eruption showed a high level of accuracy in Malaysian children.

Level of Knowledge Regarding Medicolegal Report at the Clinical Clerkship Students of Faculty of Medicine of a Private University in Indonesia: A Descriptive Study.

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Introduction: The level of knowledge regarding medicolegal report (visum et repertum) will influence a doctor's skills and proficiency in making a medicolegal report so that the visum et repertum made is of good quality and can help explain a criminal case in court. Clinical clerkship students have acquired knowledge about visum et repertum during pre-clinical education and applied it during clinical clerkships. **Objective:** This study aims to see the level of knowledge regarding visum et repertum among clinical clerkship students at the Faculty of Medicine of a Private University in Indonesia. **Methods:** The design of this research is descriptive with a cross-sectional approach. The research was conducted from March to December 2022. The population in the study were clinical clerkship students from the Faculty of Medicine of a Private University in Indonesia, who were active and had been declared to have passed the Forensic Stage in 2022, consisting of 29 samples using a total sampling technique. Data was collected using a self-made questionnaire, and validity and reliability tests were conducted. **Results:** Most of the sample was 23 years old (69.0%), female (58.6%), with experience in drafting visum et repertum 5-10 times (48.3%), and the level of knowledge of visum et repertum was stated to be deficient (72.4%). **Conclusion:** In this study, we concluded that the level of knowledge regarding visum et repertum at clinical clerkship students is categorised as deficient so that we need to evaluate the curriculum about forensic medicine in our university.

The Characteristic of Forensic Cases at Santa Maria Private Hospital in Pekanbaru, Indonesia Between 2017 to 2023.

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Introduction: The role of a forensic pathologist in a hospital includes conducting examinations of forensic pathologic cases, providing expertise in clinical forensics, and performing body embalming procedures. Forensic cases may be handled in government hospitals, police hospitals, or private hospitals in Indonesia. **Objective:** To describe the characteristics of forensic cases at a private hospital in Pekanbaru, Indonesia. **Materials and Methods:** This cross-sectional study utilised a total sampling method. Data were extracted from medical records at Santa Maria Hospital Pekanbaru from 2017 to 2023. Data were categorised based on case types, genders, and infection statuses. **Result:** There were 491 forensic cases, comprising 343 cases of body embalming, 139 cases of clinical forensic, 8 cases of postmortem external examination, and 1 case of autopsy. In embalming cases, there were 192 (56%) male cases and 256 (75%) non-infectious cases. In clinical forensics, there were 105 (76%) male patients, with road traffic accidents being the most common type, accounting for 99 (75%) cases. In postmortem external examination cases, there were 6 (75%) male patients, with road traffic accidents being the most common type, accounting for 7 (87.5%) cases. The autopsy case involved a sudden natural death from myocardial infarction. **Conclusion:** The majority of forensic cases handled in this private hospital were embalming cases, predominantly involving male victims in all case categories. Road traffic accidents were the most common type of case handled.

Pathological Insights into Postcardiac Arrest Syndrome: A Forensic Perspective Systematic Review

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Introduction: Postcardiac arrest syndrome (PCAS) represents a complex constellation of pathophysiological processes that occur following successful resuscitation from cardiac arrest. Despite advances in resuscitation techniques, PCAS remains a significant cause of morbidity and mortality in critically ill patients. Forensic examination of PCAS cases provides valuable insights into the underlying pathological mechanisms, aiding in the determination of cause of death. **Objective:** This systematic review aims to elucidate the pathological insights into PCAS, focusing on forensic practices. **Materials and Method:** A systematic search was conducted in major databases including PubMed and Google Scholar to identify relevant articles published between 2015 up to present. Three articles were included regardless of whether an autopsy was performed or not and encompassed original research, case reports, and reviews focusing on pathological findings of PCAS. Data extraction and quality assessment were performed using predefined search terms related to organ-specific injuries, inflammatory responses, and cellular pathways involved in PCAS pathology. **Results:** The review highlights the multifactorial nature of PCAS, including brain injury, myocardial dysfunction, systemic inflammation, and other multiorgan-failure. Histological examination revealed features of ischemia-reperfusion-injury, including myocardial contraction band necrosis, neuronal hypoxic-ischemic changes, and endothelial dysfunction. Evidence of coagulopathy, pulmonary congestion, and hepatic dysfunction was frequently observed. **Discussion / Conclusion:** The comprehensive synthesis of pathological data from forensic investigations sheds light on the intricate pathophysiology of PCAS and underscores the importance of postmortem examination in elucidating its underlying mechanisms. The findings have significant implications for forensic practitioners in improving diagnostic accuracy and informing medicolegal investigations related to cardiac arrest-related deaths. Furthermore, it identifies gaps in current knowledge and areas for future research to improve our understanding of PCAS from a pathological perspective, offering insights that may ultimately enhance post-resuscitation care and forensic evaluation practices.

ABSTRACTS OF POSTER PRESENTATION

The Impact of a Refresher Course in Forensic Anthropology on Forensic Scientists' Knowledge Level: Pre-test/Post-test

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As an initiative to foster and enhance service delivery, a forensic anthropology course was organised by the profession of Forensic Scientists with sponsorship from the Allied Health Sciences Division, Ministry of Health Malaysia. The aim was to refresh the knowledge of our scientists in the general assessment of skeletal remains. This course was designed to include pre-test and post-test, with a lecture on the methods and applications of biological profiling in between. The course participants were 26 scientists with two- to 19-year work experience in performing forensic anthropological casework. They self-rated themselves as novice (46.15%), advanced beginner (42.31%), or competent (11.54%). The group consisted of 11 males and 15 females. The test consisted of fifty questions based on facts and images of physical bones which covered various topics: anatomy, human/non-human, sex, age, ancestry, and type of injury. The mean score obtained from the pre-test was 67.0% + 10.12, while the mean score for the post-test increased to 75.38% + 6.87. A statistically significant difference was found when all scores were compared ($p < 0.001$). Based on the outcome, this training improves the scientists' understanding of forensic anthropology, which would increase their skills in biological profiling. Feedback suggest that such courses should be carried out regularly to foster a culture of knowledge sharing.

Adult Chicken Pox?!: Lesson Learnt from the Autopsy

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Introduction: Varicella, or chickenpox, is an infectious disease caused by Varicella-Zoster-virus (VZV) and is common among children but can be fatal in neonates, elderly, and immunocompromised individuals due to rare but severe complications such as pneumonia and encephalitis. Thus, we present an autopsy case that is suggestive of adult chickenpox. **Case Report:** A 46-year-old Malay gentleman was found dead with painless skin lesions after a week of feeling unwell prior to being found unconscious at home. He did not seek any medical advice. He had recent contact with his daughter who had chickenpox. Otherwise, no other symptoms were reported. The deceased had childhood chickenpox and recovered without any complications. Post mortem examination revealed a medium built male with multiple crusted skin lesions over the trunk and upper limbs, no vesicular lesions were seen. Internal examinations showed markedly firm lungs, no other abnormalities. Other internal organs were unremarkable. Plasma and CSF were sent for VZV-PCR, both were negative. Other microbiological analysis parameters of viral screening were unremarkable. Histopathological examination showed diffuse alveolar damage with viral pneumonia features and skin infection suggestive of VZV. **Discussions:** Although this case suggestive of a complicated adult chickenpox, the only VZV-PCR tests offered by our local lab were for plasma and CSF, yet both were negative. So far, there is no lab in Malaysia offering skin tissues for VZV-PCR. This case underscores the importance of good history taking and adequate post mortem examinations, particularly histological examinations, in the absence of gold standard post mortem diagnostic tools of this rare fatal disease in adults.

From Kawasaki to Catastrophe

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Introduction: Kawasaki disease is a systemic vasculitis predominantly affecting children under 5 years old with no known exact aetiology. Diagnosing the disease requires meeting the diagnostic criteria specified in Malaysia's Paediatric Protocol, which include fever, mucocutaneous changes, and lymphadenopathy. Although the disease is self-limiting and generally has a favourable prognosis, about 25% of cases may result in the formation of coronary artery aneurysms, which can lead to fatal outcomes. **Case Report:** This case report describes a 1-year-old boy admitted to our hospital with an initial complaint of fever, runny nose, and cervical lymphadenopathy. During admission, he developed maculopapular rashes, lower limb oedema, conjunctivitis, and pharyngitis, fulfilling the diagnostic criteria for Kawasaki disease. An echocardiogram revealed coronary artery aneurysms in the left anterior descending and right coronary arteries. He was treated with immunoglobulin, aspirin, and steroids. He was discharged on day 16. However, on the morning of day 4 post-discharge, he became unconscious and was declared dead by the attending doctor. The post-mortem examination revealed a 'blue dome' appearance with extensive coronary artery aneurysm involving two arteries. Histopathological examination showed marked transmural lymphohistiocytic infiltration without granulomatous inflammation. **Conclusion:** This case highlights the critical importance of early detection and monitoring of coronary artery aneurysms in Kawasaki disease. Using coronary CT angiography to assess aneurysm size, growth rate, and wall morphology is essential to prevent fatal outcomes.

Positional and Traumatic Asphyxia; A Case Study of Prone Restraint Cardiac Arrest

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Positional asphyxia is a form of asphyxia which occurs when someone's position prevents the person from breathing adequately. People may die when the mouth and nose are blocked, or where the chest may be unable to fully expand. Physical restraint is commonly used when dealing with people who are aggressive, uncooperative, or violent. In January 2023, a pedestrian lodged a police report stating that a guy had been seen aggressive towards an older woman near a mosque in Pantai Timur. When the police arrived at the scene 30 minutes later, the suspect was already restrained by villagers in a face-down position against cemented floor with head tilted to the left and was tied in hog tie position. A man was seen seating on that guy's back and another on the back of his abdomen. The guy was unconscious and ambulance call confirmed death after failed resuscitation. Postmortem noted a few bruises and abrasion to the face, limbs and trunk with no obvious bone fracture or open wound to the body. Florid sign of asphyxia appreciated. Both lungs were haemorrhagic. Histopathological findings revealed extensive venous congestion with pulmonary haemorrhage. Adjacent oedema was observed. In this case, a combination of positional and traumatic asphyxia is explained. The more weight, the more severe the degree of compression. Excessive venous pressures cause the major manifestation of asphyxia include facial and upper chest petechiae, subconjunctival haemorrhages and neurological signs which were observed in this case report.

Rare Case of Maternal Death: Right Ventricular Myocarditis

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Introduction: Right ventricular myocarditis is a myocardial disease that is often not diagnosed promptly especially in young individuals which can lead to sudden cardiac death. This condition poses a significant challenge for forensic pathologists due to its complex pathological changes. In this case, we describe a post mortem diagnosis of lymphocytic predominant right ventricular myocarditis. **Case report:** A 28-years-old female, G3P1+1, unbooked and unscreened, with history of one previous scar, was brought in dead to the Emergency Trauma Department. Based on the information given, she had history of worsening shortness of breath and intermittent vomiting, however refused to seek medical attention due to financial constraints. Otherwise, there were no other symptoms reported. The autopsy revealed no gross abnormalities, however, histopathological examination of the heart showed marked inflammatory cells infiltration predominantly lymphocytes within the right ventricle, suggestive of right ventricular myocarditis. **Conclusion:** This case emphasises the need to delve deeper due to the young age and gender. It sheds light on the potential seriousness of uncommon heart conditions. While the diagnosis was based on histological findings of right ventricular myocarditis, viral isolation cultures could further strengthen the diagnosis and ruling out the aetiologies. Nevertheless, meticulous autopsy and laboratory investigations were pivotal in uncovering the rare disease, ultimately revealing the cause of death for this unfortunate young mother.

Fatal Complications of Percutaneous Coronary Intervention: Case Series

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Introduction: Percutaneous coronary intervention (PCI) is a minimally-invasive procedure commonly used in treating coronary artery narrowing. It can be associated with complications ranging from minor problems with no long-term sequelae, to severe morbidity and death. In-hospital fatalities are infrequent occurrences for which autopsy may fall within the purview of a forensic pathologist. **Cases:** The first case involved a 54-year-old man at a private hospital who was diagnosed with anteroseptal myocardial infarction. He underwent coronary angiography, then balloon angioplasty and stenting of the left anterior descending artery, before collapsing 15 minutes post-procedure and was subsequently pronounced dead. Autopsy revealed thrombus occlusion of the stent, along with acute myocardial infarction of the anteroseptal left ventricular walls. In the second case, a 42-year-old man presented to a private hospital with chest pain for 3 days. He underwent coronary angiography and right coronary artery stenting but later passed away 3 hours after the procedure. Autopsy showed ruptured dissection of the right marginal artery which had led to fatal hemopericardium. **Discussion:** Post-PCI complications can be acute or delayed or categorised into coronary artery related (e.g. intramural hematoma, perforation, and thrombosis) or others such as medication/contrast-induced anaphylaxis and stroke. Investigating these deaths require thorough history-taking and knowledge on the procedures for accurate interpretation of autopsy findings. **Conclusion:** Periprocedural PCI-related deaths pose a challenge to pathologists not only during the autopsy itself, but also often involve highly emotive next of kin. In these situations, autopsy findings are valuable in addressing standards of patient care.

Is a Cut-throat Injury in a Road Traffic Accident Truly an Accident? 2 Case Report

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Introduction: Cut throat injuries to the neck can be homicidal, suicidal or accidental. Accidental incised wounds solely to the neck are extremely rare in a vehicular accident, and it will raise suspicious in the absence of witnesses to the accident. **Cases:** Case 1: A Syrian man's lifeless body was discovered in his rented vehicle in a remote area after he allegedly lost control while driving alone. An autopsy revealed an incised wound situated slanted on the anterior half of the neck above the level of laryngeal prominence with multiple minor abrasions and bruises externally. Examination of the accidental vehicle revealed the front windscreen and bonnet were badly damaged, and interiorly, there were bloodstains seen on a plastic dashboard with sharp, hard edges. Case 2: A motorcyclist allegedly skidded before colliding into a guardrail. External examination revealed a horizontal laceration on his neck, between the lower part of his chin and Adam's apple, with a fractured mandible. He also sustained head injuries. Death scene investigation showed scratched marks on the deceased's motorbike and on the guardrail. No bloodstains found along the guardrail. **Conclusion:** Road traffic crash can produce wide range of injuries, however cut throat to the neck in the vehicular accident is rare. The large deep incised wound on the neck may raise suspicion of foul play, in the absence of witness to the accident. Further death scene investigation is important to aid in finding the object that may produce such wounds and help reconstruct the events of the accident.

A Case of Fatal Suicide with Sodium Nitrite: a Case Report

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Introduction: Sodium nitrite (NaNO₂) poisoning as an effective means to commit suicide is unusual in the forensic setting in Malaysia. Sodium nitrite is an inorganic compound usually seen as a crystalline powder that is water soluble. Sodium nitrite is used mostly in the food industry as well as in medical field. Worrisomely, sodium nitrite has gained attractiveness through online suicide forums and is readily accessible to purchase online. **Case report:** This report detailed the case of a 20-year-old man who intentionally ingested sodium nitrite in a suicide attempt, following the information he obtained from an online suicide forum. He was found unconscious in the bathroom with a bottle containing clear fluid together with silver colour plastic seal bag containing whitish crystal powder. An autopsy was performed approximately 12 hours after death. The deceased's face was pale with peripheral cyanosis. No evidence of external marks of injury. The stomach contained minimal clear fluid mixed with mucus. Multiple whitish plaques were noted over the gastro-oesophageal junction area, and fixed on the mucosal surface. Toxicological analysis confirmed the crystal powder as sodium nitrite. Alcohol or other drugs were not detected in blood, urine and gastrointestinal content. The cause of death was declared as sodium nitrite poisoning. **Discussion:** Sodium nitrite poisonings represent a challenge for forensic pathologists and therefore, it is essential to acquire combination of circumstantial evidence related to the case and to perform the autopsy and a complete toxicological analysis in order to reach to a precise cause of death.

Shotgun Wound Imitating an Animal Attack: A Case Report

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Introduction: Unwitnessed deaths in forests are often challenging due to a variety of factors that could lead to death. Investigations become complicated when the offender or witness tampers with the scene of death. Here, we present a suspected animal attack that turned out to be a firearm death. **Case report:** A 74-year-old man was found dead lying on a riverbank in a forest, wearing a traditional backpack with a machete draped from his belt. During preliminary scene investigations by the police, a predator attack was initially suspected. However, postmortem radiographs (PMXR) showed multiple high-density foreign bodies of varying sizes, suspicious of projectile fragments, in his right arm with associated right humerus comminuted fractures, overlying soft tissue irregularity and subcutaneous emphysema. Autopsy confirmed a gunshot entrance wound at the right arm with satellite holes at the margin. Multiple pellets and projectiles were found inside the entrance wound in the right arm. A gunshot tangential laceration was also found at the left forearm with soot at the margin. Police later found a shotgun hidden behind a mound not far from the scene. No suspect was arrested. **Conclusion:** The satellite holes at the margins at the entry site appeared similar to puncture wounds of an animal bite. Basic frontal PMXRs enabled metallic foreign body detection quickly, thus re-directing police investigations and autopsy planning. Post-mortem imaging and autopsy were complementary to each other in ascertaining cause and manner of death in this case

To Be or Not to Be

Ahmad Faisol bin Harun, Mohd Ariza bin Kamaruddin, Mohd Redzuan bin Mohd Noor, Muhammad Marwan bin Zulkifly Apendi, Muhammad Aniq bin Mohd Amran, Siti Wira binti Md Yaro, Fatin Farisha binti Fadlee

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Introduction: Forensic pathologists encounter formidable challenges, particularly when called upon to ascertain the cause of death in cases with profound implications. This case serves as a poignant illustration of the critical role meticulous examination and thorough analysis play in assisting law enforcement in their pursuit of truth and justice. **Case Report:** A 1-year and 5-month-old boy was discovered unconscious while under the supervision of his mother's boyfriend. The boyfriend reported that the child had fallen from a 1-meter-high staircase. However, post-mortem examination revealed multiple limb bruises and a duodenojejunal transection, without external abdominal injuries. Furthermore, blood culture results indicated the presence of Group B Streptococcus, raising questions regarding the origin of the internal abdominal injury. Through a comprehensive analysis, including consideration of Casper's sign, histopathological examination, and a review of literature, the forensic pathologist provided critical insights. This evidence, presented before the court of law, shed light on the rarity of bowel perforation from stair falls in children, urging a closer scrutiny for potential child abuse. **Conclusion:** While the cause of death could not definitively conclude homicide, the forensic pathologist's discerning analysis highlighted discrepancies between the reported history, post-mortem findings, and critical review. This emphasises the necessity for thorough forensic investigations in cases of suspected child abuse to ensure justice and protect vulnerable individuals.

A Galaxy of Streptococcus: Constellation of Bruise

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Introduction: The public often perceives deaths in custody as instances involving physical abuse or mistreatment by authorities. Such deaths are typically portrayed as tragic events, prompting widespread condemnation of the police force. Regardless, the majority of deaths in custodial settings are due to natural causes and have no correlation with trauma or injury. **Case report:** Here, we present a case of a custodial death involving a 38-year-old male who was incarcerated for drug-related offense and was found dead in a lockup at a police station. The deceased was originally from the Pengkalan Chepa prison but had spent the night in the police lockup on the day of his death due to the late completion of his court proceedings. The post mortem examination revealed meningococcal infection due to *Streptococcus constellatus* infection, which had led to his death. However, right 'black eye' was observed which had raised concerns and dissatisfaction among the deceased's family members. Apart from post mortem examination, we examined the medical records from the prison and hospital and interviewed the assistant medical officer who was in charge of the prison's clinic in order to interpret the post mortem findings. **Discussion:** Our findings underscore the importance of holistic approach and meticulous post mortem examination to confirm or refute allegations made pertaining to the case, particularly as the manner of death was concluded to be due to natural cause.

Fatal Vaping Product Consumption Associated Lung Injury Death In A 24 Year Old Male In Rompin, Pahang: An Autopsy Case Study

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Introduction: E-cigarette or vaping associated lung injury (EVALI) is a diagnosis of exclusion with no specific diagnostic test, however the morbidity and mortality of the disease have become more significant with the rise of abundant vaping products in the Malaysian market. The public is unaware of the serious complications which can arise with long term consumption of the product. **Case report:** We report a case of fatal EVALI in a young immunocompetent male. The deceased has no history of cigarette smoking and has been an avid vape user for almost 10 years. He was found collapsed during working and was brought immediately to the emergency department. He was pronounced dead shortly after. Autopsy examination showed glaring pulmonary oedema. Microscopic examination of the lungs showed marked diffuse alveolar damage with the presence of hyaline membrane formation, Type 2 pneumocyte hyperplasia and alveolar wall thickening with oedema. Foamy macrophages, lymphocytic and eosinophil infiltration were seen within the affected areas. **Conclusion:** The rise of E-cigarette consumption among youngsters, especially middle and high school students, is becoming an epidemic in Malaysian population, thus we aim to exemplify the detrimental effect of vaping by sharing the pathophysiological changes of vaping via autopsy and histopathological examinations.

Rare Encounter: Partial Hanging Combined with Self-strangulation A Case Report

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Introduction: Hanging is the most common asphyxial method of suicide while other methods such as self-strangulation by ligature are rather uncommon method. Hanging deaths are usually considered suicidal while strangulation deaths are often regarded as homicidal until proven otherwise. Self-strangulation also needs to be distinguished from accidental sexual asphyxia. We are reporting a rare case of hanging which was executed with a combination of self-strangulation and partial hanging using a rope with the formation of two fixed knots forming one larger loop where the left forearm was suspended for self-strangulation and a smaller loop used for partial hanging. **Case report:** A 25-year-old male, history of divorce, drug abuse, and attempted suicide in the past was found hanged at his bedroom door with his body partially suspended. The ligature was hanged to a nail nailed to the bedroom door. His left upper limb was flexed and hung inside a larger loop connected to a fixed knot forming a smaller loop around his neck and ending at the fixed knot above his head. There were two similar parchmented abrasion wounds found at his neck and his left forearm. The deceased's death was concluded as hanging. **Discussion:** The theory is that due to the common belief among the general public that partial suspension was insufficient to cause death, thus resorted to self-strangulation by pulling the rope using his left forearm which was connected to the loop around the neck adding more pressure to the neck in combination with the effect of partial hanging

Chlamydia Trachomatis Infection Repercussions Sexual Violence Against Children in Dormitories

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Introduction: Chlamydia is a common sexually transmitted disease (STD). It is caused by bacteria called *Chlamydia trachomatis*. It often does not cause symptoms. If the infection spreads, possible symptoms that may occur include fever, nausea, lower abdominal pain and painful sexual intercourse. A case of *Chlamydia trachomatis* infection repercussions of sexual violence against a child in dormitory is presented. **Case:** A body of fourteen year old girl was brought to the hospital for a post-mortem examination. Further history by school supervisor revealed that she complained of fever and abdominal pain accompanied by nausea and vomiting. No respiratory symptoms were elucidated. There were evidences of multi-organ failures detected at post-mortem examination characterised by pleural adhesions and consolidated lungs, infected kidneys and generalised pallor of other organs. There were bruises of the labia with tears detected over the hymen and the anal funnel. Swab from the vagina isolated *C. trachomatis* while histology of the lungs revealed pneumonic changes. **Conclusion:** In potential cases of sexual violence amongst children especially in a dormitory, where the truth may not be forthcoming by the school authority, detailed forensic post-mortem examination including scene visit is paramount to reveal the truth.

You Are What You Excrete: A Case of Meconium Aspiration Syndrome

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Introduction: Meconium aspiration syndrome (MAS) is described as respiratory distress in a neonate born through meconium-stained amniotic fluid which cannot be explained clinically. It is thought that meconium and amniotic fluid is sterile, and that initial bacterial colonization occurs via maternal vaginal and faecal bacteria contamination through either the birthing

process or by circumstances that may facilitate intrauterine infection such as premature rupture of membranes. *Case report:* We report a case of a newborn baby girl who was delivered by a 'traditional midwife' at home. Circumstances were uncertain, but she was said to be alive and crying at birth. She was later brought to the emergency department in view of worsening respiratory distress where resuscitative attempts were given. She was noted to be cyanosed with no signs of life or documented vital signs. Laryngoscope inspection revealed meconium particles in the larynx. She was pronounced dead at 2 hours of life. Post-mortem examination had revealed a livebirth, term baby girl with the umbilicus, stomach content, distal airways and lungs stained with yellow-green meconium. The lungs were uniformly consolidated. Microscopic examination confirmed aspiration of amniotic fluid with meconium in the airways and alveolar spaces with concurrent suppurative pneumonia. Grade 2 thymic involution was also seen. Post-mortem lung tissue cultures isolated *Klebsiella pneumoniae* and *Escherichia coli*. Otherwise, no congenital anomalies were present. *Conclusion:* This case highlights a case of meconium aspiration syndrome in a newborn baby with evidence of possible preceding intrauterine infection causing concurrent suppurative pneumonia.

Death In Perilous Confinement

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Introduction: Death in confined spaces presents a unique and challenging scenario in forensic medicine. This autopsy case report addresses the circumstances surrounding deaths that took place inside the lorry tank, where noxious gases or a lack of oxygen concentration led to asphyxiation. *Case Report:* We present autopsy cases involving two workers who were found unresponsive inside the lorry tank while they were cleaning the tank. The autopsies revealed two medium-build gentlemen wearing pants and shirts without donning any special protective equipment or safety gear. The external examinations of the well-preserved bodies showed signs consistent with asphyxiation, including cyanosis of the lips and fingertips associated with congestion over the heads, necks and shoulders. The internal examinations showed no remarkable findings related to the other organs except lungs edema and congestion. Microscopic examinations revealed passive congestion that was evident in the lungs, spleen, kidneys and adrenal glands. However, extensive toxicological screenings failed to identify the specific gas compound responsible for the asphyxiation, presenting a perplexing diagnostic dilemma. Investigative efforts included environmental sampling, occupational history review, and consultation with chemical experts, yet the precise nature of the gas remained elusive. *Discussion:* The absence of identifiable gas residues at autopsy or known occupational exposures further complicated the case, highlighting the challenges in elucidating uncommon gas-related fatalities. Thus, to prevent a similar event from happening, the cleaning workers of the peculiarities of confined spaces must adhere to strict entry protocols to carry out their duties. The workers also must be properly equipped with special safety gear to prevent such a horrendous event.

Paediatric Berry Aneurysm

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Introduction: This autopsy case report presents the findings of a rare occurrence of a ruptured berry aneurysm in a young adolescent. Berry aneurysms are typically associated with older age groups, making this case particularly noteworthy. *Case report:* A 12-year-old Malay young adolescent with pre morbidly obese (BMI 28), presented with sudden loss of consciousness in the late afternoon. He had never experienced any episodes of intense headache, nausea or vomiting. There was no recent head trauma. No family history of neurologic or vascular disorders. Postmortem examination revealed a saccular aneurysm located at the junction of the Posterior Cerebral Artery. The saccular aneurysm exhibited signs of acute rupture at the aneurysmal fundus, with extensive subarachnoid haemorrhage. No significant underlying vascular abnormalities or predisposing factors such as hypertension or connective tissue disorders were identified upon thorough histological evaluation. *Conclusion:* The rarity of berry aneurysms in adolescents, particularly those without predisposing factors, underscores the importance of considering such diagnoses even in younger populations presenting with sudden-onset neurological symptoms. This case emphasises the critical role of postmortem examinations in elucidating the underlying pathology and contributing factors in unexpected deaths, especially in cases with atypical clinical presentations. Understanding the pathophysiology and risk factors associated with berry aneurysms is crucial for early detection and intervention, especially in young individuals where the clinical suspicion may be low. Further research is warranted to explore the incidence, etiology, and management strategies for berry aneurysms in paediatric and adolescent populations to improve diagnostic accuracy and patient outcomes.

A Postoperative Death From An Unexpected Cause: A Clinically Missed Complete Transection Of The Thoracic Aorta

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Introduction: Thoracic aorta rupture is one of the leading causes of rapid death among road traffic fatalities, where only 20% survive more than 30 minutes following injury. Concomitant polytrauma from the initial insult may distract clinicians from detecting the aortic rupture early or even cause the injury to be missed altogether. Given the typically lethal outcome of a complete aortic rupture, delayed death is most unusual. We report a case of a traffic collision victim who died following

laparotomy for abdominal trauma from a clinically undiagnosed complete aortic transection. *Case report:* A 29-year-old motorcyclist was admitted to the hospital fully conscious, albeit hypotensive, after a traffic collision. A diagnosis of abdominal trauma with left-sided haemothorax was established clinically, and a left-sided chest tube drained 650 ml of blood. He remained stable throughout an exploratory laparotomy until an hour postoperatively when his left-sided haemothorax suddenly worsened. A resuscitative thoracotomy proved unsuccessful; he died 5 hours post-laparotomy after surviving the initial trauma for 13 hours. An autopsy revealed a complete aortic transection at the aortic isthmus with a ruptured pseudoaneurysm. The histology of the aortic rupture site was in keeping with the clinically documented survival interval. *Discussion:* Cases of delayed death involving clinically undiagnosed partial aortic transection with pseudoaneurysm formation have been reported. Rarer still is the trauma victim with an undiagnosed complete aortic transection who survives a major surgery only to succumb to the aortic injury later. The pathology and pathogenesis of blunt traumatic aortic rupture will be discussed.

PMCT in PBT/CAGE: A Case Report of a Scuba Diving Fatality

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Introduction: Although drowning is the usual immediate cause of death in scuba diving fatality, it is imperative to determine its potential underlying cause. Divers who fail to vent during uncontrolled ascent are at risk of developing pulmonary barotrauma (PBT) and subsequent cerebral arterial gas embolism (CAGE) that can cause them to lose consciousness and eventually drown. The role of postmortem computed tomography (PMCT) in investigating scuba diving fatalities has been discussed extensively in the literature. However, its role can be rendered contentious by the postmortem off-gassing phenomenon. We report a case of a scuba diving fatality where the PMCT showed evidence of PBT/CAGE. *Case Report:* A 42-year-old female novice scuba diver was found unconscious on the seabed at a popular diving site off the northern west coast of Peninsular Malaysia. She was subsequently declared dead on arrival at the Emergency Department of the local tertiary hospital. A PMCT at the Radiology Department revealed gas in the cerebral arteries, heart ventricles and other arteries in the absence of gas in the muscles and joints. An autopsy the following day showed gas in the heart ventricles, and evidence of barotrauma to the lungs was demonstrated on histology. Her death was certified as drowning caused by PBT and CAGE. *Discussion:* The pathophysiology and postmortem diagnosis of PBT/CAGE in scuba diving fatality and the role of PMCT in PBT/CAGE will be discussed. This case highlights the utility of a readily available hospital CT scan service in the investigation of an unnatural death.

Premature Death in a Young Adult with a Probable Williams-Beuren Syndrome

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Introduction: Williams-Beuren syndrome (WS) is a rare, multisystemic genetic disorder caused by micro deletion of chromosome 7q11.23. Clinical features include characteristic elfin-like facies, developmental delay, intellectual disability, unique personality, cardiovascular diseases - in particular, supravalvular aortic stenosis and peripheral pulmonary stenosis, connective tissue abnormalities, and growth deficiency. Diagnosis is confirmed through fluorescent in-situ hybridisation test (FISH) for WS, SNP array or exome sequencing. *Case Presentation:* We present of a probable WS case in an 18-year-old Malay male who collapsed and died after defecation. He had no known complaints or illness apart from one day history of dry cough. Autopsy revealed a small built young male with elfin-like facies (thick lips, hypodontia, puffy eyelids and large ears), supravalvular aortic stenosis, floppy mitral valve, atherosclerosis with critical stenosis in all three coronaries, stenosis of coronary ostia and left ventricular hypertrophy. Lung histology showed stenosis in the peripheral pulmonary arteries. Gross and histological examinations of other organs were unremarkable. Death was attributed to supravalvular aortic stenosis and coronary atherosclerosis. History of delayed walking, poor academic performance and overfriendliness behaviour were obtained retrospectively. Although confirmatory genetic testing described earlier could not be accomplished in this case, there is high suspicion of WS based on the clinical features and the history. *Conclusion:* A premature death among individuals with WS may be prevented with early medical intervention and follow ups. Recognition of genetic disorders in forensic setting should not be limited to establishing cause of death, but also to facilitate counselling and screening for at-risk family members.

Snipping Fate: A Seamstress's Final Cut

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Introduction: Self-inflicted abdominal sharp force injuries are exceptionally rare, presenting a significant challenge for Forensic Pathologists in differentiating between homicidal, suicidal, and accidental stab wounds. While typically non-lethal on their own, injuries accompanied by solid organ and/or vascular damage can ultimately prove fatal. *Case Description:* We present a case involving a 75-year-old seamstress with underlying degenerative disc disease and depression. She was

discovered in the porch of her home with a single stab wound to the abdomen. Nearby, a pair of tailoring scissors was recovered on an elevated makeshift stand and a suicide note was found at the prayer altar inside the house. Her clothing was undamaged. The autopsy revealed a pale elderly female with a single oblique stab wound to the epigastric region, with no hesitation or defensive wounds. The stab track had traversed the peritoneum, injuring the liver, and resulting in significant hemoperitoneum. Toxicology results were negative. *Discussion:* The use of tailoring scissors in self-stabbing is rare. In this case, we delve into the role of a comprehensive post-mortem examination and in-depth crime scene analysis to determine the cause and likely manner of death. Additionally, we explore the intriguing relationship between the victim's occupation as a seamstress and her choice of implement for the stabbing, as well as the circumstances surrounding her final resting place before her body was eventually discovered.

Sudden Cardiac Death in Systemic Amyloidosis

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Introduction: Amyloidosis is a rare condition which causes extracellular deposition of fibrillar proteins responsible for tissue damage and dysfunction. There are 30 different types of proteins which binds to variety of proteoglycans or glycosaminoglycans that when stained give off characters of starch (amylose). Amyloidosis can be localized as well as systemic depending on the type of protein. *Case Report:* A 53-year-old Indonesian female with no known medical illness, was found unresponsive in her room. She was brought in dead to Hospital Sultan Ismail, Johor Bahru. On postmortem examination, externally showed no purpuric cutaneous lesions, macroglossia, or pedal edema. Internally, there was no cardiomegaly, hepatosplenomegaly, waxy kidney surface or bowel necrosis. On histological examination displayed amyloid deposition in the myocardium and coronary arteries characterised by salmon pink materials with congo-red stain and apple green birefringence appearance under polarizer. The spleen, liver and kidney also showed amyloid deposition. These amyloids causing myocardial stiffness resulting in restrictive cardiomyopathy and impingement of the conduction system resulting in arrhythmia which are fatal. *Conclusion:* About 95% of cardiac amyloidosis cases are caused by the deposition of transthyretin (TTR) or immunoglobulin light chains (AL amyloidosis). 50-70% of cardiac amyloidosis cases are of AL amyloidosis typically present at the age >40 years. Where else TTR is typically present at the age the of >60 years. The symptoms depends on affected organs and may not experience until the late course of the disease. Cardiac amyloidosis causes dysfunction of muscle and conduction system that leads to arrhythmia and eventually death.

Correlation Of Sex and Age with Cervical Vertebral Bodies Based On Head and Neck CT Images

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Introduction: This study examined the use of third cervical vertebrae (C3) for sex determination and age estimation. Multi-Detector Computed Tomography of 130 cases were used to quantify the volume and bone trabecular structure of the C3 bodies and to evaluate its correlation with sex and age. *Methods:* The vertebral body volume was measured using 3D analysis software (ZedViewDB) and calculated by creating a mask of hard tissue in the horizontal and sagittal planes of the CT data. The measurement items were bone tissue volume (TV) [mm³], bone volume (BV) [mm³], bone surface area (BS) [mm²] and their divided bone volume density (BV/TV) [%], bone surface bone tissue volume ratio (BS/TV) [mm²/mm³], bone surface volume ratio (BS/BV) [mm²/mm³], bone surface bone tissue volume ratio (BS/TV) [%], bone surface volume ratio (BS/BV) [mm²/mm³], and trabecular bone thickness (Tb.Th) [mm]. *Results:* The vertebral volumes were significantly different between the sexes. There was no significant correlation by age for either sex. Regarding measurements of trabecular bone and bone marrow cavity, significant differences were observed between the sexes in TV, BS. Regarding age correlation, a positive correlation was observed for BS/BV, and a negative correlation was observed for BV/TV. For all items, this trend was more pronounced in women than in men. *Conclusion:* It was suggested that those changes could be applied to age estimation.

Pertussis Peril: Unmasking the Silent Threat of Fatal *Bordetella pertussis* Infection in Infants

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Introduction: Pertussis is a contagious respiratory disease characterised by episodes of severe coughing and paroxysms that can be fatal. Infants aged less than 3 months old were more susceptible to severe *Bordetella pertussis* infection compared to those in older age group and may exhibit only subtle symptoms due to their underdeveloped immune systems. Hereby, this is a case of an infant who was asymptomatic but was discovered to be infected with pertussis following an autopsy. *Case:* A 34-day-old Malay baby boy, delivered full term with an uneventful delivery and immunized up to his age, was discovered unconscious and pronounced dead 20 minutes after paramedics arrived. The police brought him to Hospital Raja

Perempuan Zainab II in Kota Bharu, Kelantan, for an autopsy. The mother denied that he had any upper respiratory tract infection symptoms prior to his death. The autopsy revealed haemorrhagic and oedematous lungs, as well as detection of *Bordetella pertussis* on the nasopharyngeal swab sent for PCR testing. Histopathology analysis of lung sections showed diffuse alveolar damage with intra-alveolar haemorrhage. *Discussion:* Certain infants with pertussis may exhibit no symptoms of coughing. Instead, the condition might result in cyanosis or respiratory distress, ultimately leading to death. This case highlighted the significance of nasopharyngeal swab culture and PCR testing for every infant autopsy for pertussis screening. This case also stressed the importance of immunizing pregnant women against pertussis to protect their unborn children, as maternal antibodies provide passive immunity before the first DTaP (diphtheria-tetanus-pertussis) series at 2 months of age.

Misleading Battle Sign in a Child: Otitis Media Presenting as Non-accidental Injuries in a Paediatric Autopsy Case – A Unique Encounter

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Introduction: Battle sign, defined as bruising over the mastoid process typically resulting from head trauma, holds significant forensic importance, especially in paediatric fatalities, as it raises suspicions of potential non-accidental injuries. Alternatively, severe otitis media complicated by mastoiditis may exhibit similar mastoid appearances. *Case report:* We present the case of a 9-month-old female infant with complaints of lethargy, fever, and bilateral ear discharges for two days. She was brought to Hospital Kuala Kubu Bharu and later pronounced dead after a failed resuscitation attempt. Despite signs of infection, bruises resembling Battle sign prompted suspicion of non-accidental injuries, leading to referral for autopsy at a tertiary hospital. No other external injuries were observed upon external examination. Internal examination revealed a greyish-erythematous right external auditory canal extending to the right ear pinna with mastoid ecchymosis. Upon exposing the petrous part of the temporal bone, haemopurulent fluid and underlying necrotic tympanic membrane were discovered. Other internal organs appeared unremarkable. Laboratory investigations confirmed infective nature, isolating *Streptococcus pyogenes* and *Klebsiella pneumoniae* in the blood, lungs, middle ear cavities, and cerebrospinal fluid. The cause of death was certified as *Streptococcus pyogenes* and *Klebsiella pneumoniae* sepsis. The natural manner of death concluded by the autopsy defused earlier suspicions of non-accidental injuries. *Conclusions:* We advocate for avoiding premature conclusions when encountering Battle sign. While no literature confuses these pathologies, this case showed the importance of considering alternative diagnoses, as death was attributed to otitis media complications rather than non-accidental injuries, as revealed by autopsy findings.

Non-traumatic Cardiac Tamponade in a Road Traffic Collision

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Introduction: Cardiac tamponade due to various causes can be categorised into traumatic and non-traumatic in origins. While blunt trauma remains as the common cause of cardiac tamponade, other aetiologies should be considered and investigated in cases where trauma history is present. *Case report:* A 68-year-old obese lady was found unconscious in the driver's seat after colliding with another vehicle and being halted by the roadside divider. Chest compression was performed by attending medical staff on site. External examination showed minimal abrasions and bruises around the chest. However, the subcutaneous tissue dissection was unremarkable. There were 2nd to 4th anterior rib fractures bilaterally with minimal haematoma seen at the fracture site. No sternal bone fractures. The lungs were oedematous but not injured. The pericardium was intact with no contusion seen on the surface. There was cardiac tamponade composed of 180 gm of blood clot. An area of ruptured myocardium was identified at the anterior wall of the left ventricle. The wall was thinned with yellow-tan discolouration of the myocardium. No fatal injuries were noted upon examination of other systems. Histopathological examination revealed evidence of recent and remote myocardial infarction. *Conclusion:* Cardiac tamponade may present in either a traumatic or non-traumatic condition. This case describes the presence of evidence pointing towards both conditions. It often manifests as sudden death which raises the high index of suspicion regarding both the cause and manner of death. We encourage considering all possible pathologies in cases with compounding findings, especially with patients under special circumstances.

Case Report: Differentiation of Electrocution and Lighting Strike

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Introduction: Death by electrocution and lightning strike has similar mechanism of injuries although lightning is a natural occurrence. They both present with quite distinct history. Here, we present a case with vague history that a detailed examination of the death scene and post-mortem findings shed light on the precise circumstances leading to his demise. *Case Report:* A 45-year-old gentleman with hypertension, dyslipidemia, and ischaemic heart disease was brought in dead to the Emergency Trauma Department after reportedly being struck by lightning while working in the rain. At autopsy, there was multiple linear burn marks on the skin of upper front chest, from the right shoulder to the left nipple, and at the back.

Internal examination was unremarkable. No Lichtenberg skin rashes or ear bleeding noted. The clothing was not available to be examined. Histology of the burn skins showed nuclear streaming, dermoepidermal separation and coagulative necrosis that was consistent with electrical injury. Retrospective scenes visit and detailed history taken from the colleagues revealed deceased was welding in the engine room of the excavator during thunderstorm. There was clear description of body spasm that was only stopped when electric supply was cut off. The colleague felt the electrical shock when he makes contact with the deceased. *Discussion:* Lightning strike and electrocution with wet entry point may both have negative autopsy findings. As the mechanism of deaths are similar, the analysis of the death scene and scrutinization of the circumstances will be of utmost important to determine the cause of death.

Silent Innocence Lost: A Case Series Investigating Suspected Neonaticide

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Introduction: Neonaticide, the killing of a newborn within the first 24 hours of life, is a rare yet distressing occurrence that presents significant challenges for healthcare providers, law enforcement, and society. This case report delves into the intricacies of suspected neonaticide cases through the analysis of two distinct cases. Through detailed postmortem examination (PME) and multidisciplinary investigations, we aim to illuminate the multifaceted nature of these tragic events. *Case series:* Case 1: a full-term female neonate was discovered submerged in a pail of water in the bathroom of a student hostel. PME showed sign of live birth with no visible mark of injury, asphyxia features and frothy fluid in the airways and lungs, indicative of drowning. Histological examination confirmed the presence of water in the respiratory passages, supporting the diagnosis of asphyxia due to drowning during birth. Case 2: a full-term newborn female, was discovered at dumpsite. The infant's neck was wrapped with towel and constricted by a rubber band. PME revealed sign of live birth and ligature mark encircling the neck. Additionally, facial congestion and petechial haemorrhages were noted, consistent with sign of asphyxiation. *Conclusion:* The "Silent Innocence Lost" case series underscores the tragic consequences of neonaticide and highlights the importance of early intervention and support for at-risk mothers. Forensic analysis played a crucial role in identifying the victims and determining the causes and manner of death. Further research and public awareness initiatives are needed to address the underlying factors contributing to this tragic phenomenon and implement effective preventive measures.

Unseen Danger

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Introduction: Electric injuries are relatively uncommon but can result in significant mortality, which are preventable with safety measures. Several incidents were documented associated with heavy rain and electricity leakage from a nearby electrical pole. *Case report:* A 19-year-old young chef was found dead on the pavement next to a road and is believed to be returning from work late at night in heavy rain. A scene visit was done after an external examination revealed burn wounds on his right calf and heel resembling electrical burns. There was no traumatic injury or significant disease process observed during the autopsy that could have caused or contributed to his demise. The police were advised to bring an electrician to check the scene. At the site where the deceased was found, a metal railing was noted along the pavement with an electrical pole nearby. Electricity leakage was discovered from the electrical pole to the pool of stagnant water caused by recent rain on the road and pavement. Immediate repair of the electrical pole was done to prevent further mishaps. *Discussion/Conclusion:* Water and metals conduct electricity, causing death due to their combined effects. A stagnant pool of water near a faulty electrical pole caused an electrical shock, causing fatal arrhythmia. Despite entry-exit wounds, the electrical current interfered with heart conduction. Due to a lack of eyewitness or CCTV evidence, a thorough scene investigation and scenario reenactment helped understand the incident. Forensic practitioners must alert authorities, ensure corrective action, and emphasise routine maintenance of public infrastructure to prevent similar incidents.

Tracing the Trail: Investigating a Death Associated with Glue Sniffing

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Introduction: Inhalant abuse, such as glue sniffing, entails intentionally inhaling the volatile fumes emitted by substances to achieve euphoria. Toluene, a volatile chemical found in many household products and often used as an organic solvent in glue manufacturing, is frequently abused for its psychoactive effects. Despite its easy accessibility in household items, glue sniffing is far from harmless, and can lead to severe outcomes, including death. *Case Report:* We present the case of a 29-year-old male, who had a history of regular glue sniffing and was discovered deceased in his bed, accompanied by a plastic bag containing yellowish adhesive-like substances. During autopsy, traces of yellowish glue-like substances were observed on his clothing, face, and limbs. No significant signs of injury or underlying natural diseases were found

during autopsy, that could have caused or contributed to his death. Histology of the lungs revealed alveolar oedema and haemorrhages. Toxicological analysis confirmed the presence of toluene in various samples i.e. blood, urine, lungs, liver, and kidney tissues. Hence, the cause of death was determined to be toluene toxicity. *Conclusion:* Diagnosing a potential death resulting from volatile hydrocarbons can be challenging without comprehensive scene and autopsy findings. The process heavily depends on toxicological analysis of body fluids or tissue samples to identify the presence of these volatile organic compounds. Hence, the toxicological investigation is crucial in arriving at a conclusion, as evidenced in this case.

The Perils of an Underwater Treasure Hunt: An Autopsy Case Report

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Introduction: Though several years have passed since the COVID-19 pandemic, struggles of the common folk continue to abound. Earning an income can be difficult for some that they may resort to various measures merely to survive. Selling items that are worthless to many of us but a treasure to others, such as second-hand golf balls, may even help one to get by. Even so, collecting used golf balls from golf course ponds for sale comes with an even bigger price. We discuss a case that illustrates the unfortunate outcome of hunting – underwater – for such treasures. *Case:* A 43-year-old Malaysian male divorcee was found dead in a golf course pond. He had a history of illicit drug use and regularly trespassing the golf course at the local country club to gather golf balls. A postmortem examination revealed the presence of at least 200 golf balls in his clothing and superficial blunt injuries on the face and both upper and lower limbs. Along with histology and diatom analysis, the death was concluded to be due to drowning with concurrent cerebrovascular accident. *Discussion:* Engaging in underwater activities is not without consequences, some of which can be fatal. The above case demonstrates the possible interplay of both trauma and natural disease in causing death, the likely manner of death and the merits of different ancillary investigations in such cases, among others. Other important issues pertaining to the case shall be discussed.

Take My Breath Away: a Case of Suicide By Helium Inhalation

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Introduction: Suicide by gas inhalation such as helium is relatively uncommon in Malaysia compared to Europe and the US. The method involving covering the head with a plastic bag and connecting it to a gas canister is even less common. We present a case of suicide utilising this precise method. *Case report:* A 37-year-old male was found unconscious with his head wrapped in plastic bags, with a plastic tube connected to a helium gas canister. The canister valve was opened and it was empty. A suicide note was found nearby and there were no signs of foul play at the scene. Post-mortem examination findings were non-specific with no evidence of natural illness. Toxicology analysis of the intratracheal gas did not detect any gas. Therefore, given the circumstances and lack of autopsy-specific and toxicology findings, the cause of death was attributed to asphyxiation due to helium inhalation. *Discussion:* This form of suicide commonly does not leave any noticeable marks or pathomorphological findings during autopsy. If the plastic bag and the supplementary equipment are removed by another person, the cause and manner of death may be very difficult for forensic pathologists to establish. Thus, in this type of death, a thorough death scene investigation and autopsy, with a proper technique for collecting gas samples is essential and will be discussed in the case report. Other types of gases used in suicide, along with their respective toxic effects will also be discussed.

The Tale of Bujang Senang: a Case Report of Fatal Crocodile Attack

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Introduction: Crocodile attack incidents are not uncommon and present a significant public health concern in Sarawak. A better understanding of the injury patterns in such lethal attacks is crucial for forensic investigations, which can lead to effective prevention strategies. This case report provides a detailed examination of the pattern of injuries observed in a fatal crocodile attack, emphasising the characteristic features of crocodile bites and their forensic implications. *Case:* A 15-year-old male was reported missing after being witnessed in an attack by a crocodile during a fishing trip in a crocodile-inhabited area. His mutilated body was discovered on the riverbank the following day by the rescue team. Analysis of the injury pattern revealed several distinct characteristics: near decapitation, amputation of limbs, deep lacerations with serrated margins, fractures, crush injuries, and multiple bite sites distributed across the body. The cause of death was attributed to multiple injuries due to the crocodile attack. *Conclusion:* The distinct pattern of injuries observed in fatal crocodile attacks provides valuable insights into crocodile-human conflicts. Recognising the characteristic features of crocodile bites is essential for accurately diagnosing and documenting injuries, thereby aiding in the investigation and prevention of future crocodile-related fatalities.

Trampled to Death by a Falling Elevator: A Tragic Workplace Accident Case Report

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Introduction: In Forensic Medicine practice, dealing with a fatal workplace accident is not uncommon. An accident in the workplace has been defined as an undesired event that results in harm to people, damage to property, or loss to process. In Malaysia, any injury either fatal or non-fatal that is sustained at the workplace is required to be reported to the Department of Occupational Safety and Health as stipulated in Occupational Safety and Health Act 1994. **Case:** We present a fatal workplace-related accident involving a 24-year-old elevator maintenance worker who was crushed by a falling elevator in the elevator shaft. The incident occurred while he was performing routine maintenance at the bottom of the elevator shaft, when suddenly an elevator from the third floor plummeted, crushing his body. A forensic autopsy revealed fatal blunt trauma to the chest and abdomen. A retrospective scene visit shed further light on the pattern of injuries observed on the deceased's body and the probable mechanism of injury. **Discussion and conclusion:** Occupational safety and health are of utmost importance in preventing work-related injuries, illnesses, and fatalities. This case was investigated under Section 15(1) of the Occupational Safety and Health Act 1994 (Act 514) to enhance occupational safety and prevent such incidents from recurring in the future.

Entangled Truth: Deciphering Isadora Duncan Syndrome in Vehicular Fatalities

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Introduction: Most fatalities in vehicular crashes result from severe blunt force injuries, although some individuals may die from asphyxiation. There have been documented cases of accidental neck strangulation due to clothing entanglement in vehicular crashes, also known as "Isadora Duncan syndrome." However, those cases typically involve long scarf-like garments, and the scene remained unaltered. This case report discusses a similar rare occurrence of accidental strangulation caused by entanglement other than long scarves, where the circumstances of the death were not thoroughly investigated by the authorities. **Case:** A 20-year-old motorcyclist was discovered unresponsive by a dark roadside after his motorbike skidded upon returning home from work. His brother, who works the same shift, found the deceased a few minutes later while traveling the same route. Autopsy examination revealed discernible injuries to the neck without any lethal trauma to the body. However, florid signs of asphyxiation were noted, which further warrants confusion as to the mechanism of death. Circumstances surrounding the scene by police were inconclusive. Upon further questioning, it became clear that the scene had been altered when the brother removed an entangled sling bag around the neck prior to the arrival of the police. **Conclusion:** Given the rarity of asphyxia deaths in vehicular crash cases and the nonspecific signs associated with asphyxia, this case demonstrated the challenge forensic pathologists face in establishing the mechanism and cause of death. Therefore, scene visits in order to reconstruct the event, coupled with a meticulous analysis of the circumstances were proven to be advantageous.

Assessing Age Through Dental Radiographs: A Review of Age Estimation Methodologies in the Malaysian Population

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Introduction: Dental age estimation is used for profiling individuals and as an adjunctive measure in the identification of both living and deceased cases, with age estimation primarily conducted through radiographic imaging techniques. **Objective:** This review aims to examine dental age estimation methodologies adopted in the Malaysian population, specifically on the use of radiographic techniques in evaluating relevant parameters. **Materials and methods:** The review was conducted following PRISMA guidelines and the search was performed in Scopus, Web of Science, and PubMed using "dental age estimation" AND Malaysia as keywords. Only original studies related to forensic work that use radiographs for dental age estimation are included. Data collected comprised of author, publication year, teeth and parameters used, sample size, and target population. **Results:** 14 studies that were published between 2008 and 2023 fulfil the criteria. The Demirjian method, focusing on the developmental stages of the seven left mandibular teeth was prevalent in eight studies. Other methodologies like Willems, and pulp/tooth volume ratio analysis were less used. A total number of 10 studies incorporated more than one methodology in their observation. Four studies focus on different methods each, namely Kvaal, Modified Bang & Ramm, Matisikidis, and analysis of the surface area of roots. **Conclusion:** Demirjian's method emerged as the most utilised method, likely due to its accuracy, alongside the Willems method. These methods primarily targeted children and adolescents aged 4 to 24 years old. In contrast, various methods such as the analysis of the pulp/tooth volume ratio were used for the adult population.

Mapping Dental Services: A Review of GIS Applications in Dentistry

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Introduction: Geographic Information System (GIS) software is widely used across various disciplines for advanced mapping and analysis, enhancing decision-making processes. In forensic odontology, it has the potential to aid systematic tracking of dental records and increase the chance of positive reconciliation between antemortem and postmortem dental findings, thus facilitating identification processes in forensic cases. This scoping review consolidates studies on GIS applications in dentistry, enhancing their role in improving dental services and forensic odontology investigations. **Objectives:** To explore the application of GIS software in geographic mapping of dental services and its potential in tracing records to aid forensic dental comparisons. **Materials and method:** Three electronic databases were searched systematically to identify studies employing GIS software in mapping dental services. Inclusion's criteria include full, accessible, relevant English articles only, involving GIS software, and assessing distributions of dental services. **Results:** The search yielded 90 articles, which 33 met the inclusion criteria. From 2002 to 2023, studies largely focused on diverse populations, particularly in Australia. Studies mostly used QGIS to explore spatial relationships between populations and dental clinics, using retrospective cross-sectional designs with census data. Key findings include using buffer zones and Euclidean distances to measure accessibility and disparities in dental health services. **Conclusion:** GIS software is essential for visualizing and analysing dental service distributions. This approach supports dentistry advancement and addresses geographic disparities in accessing dental health services; however, there is yet to be a potential link between GIS mapping and extended use in record tracing for antemortem dental searches in Malaysia.

The Silent Rupture: Exploring Sudden Death from Boerhaave Syndrome

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Introduction: Boerhaave syndrome is a spontaneous or sudden oesophageal rupture which is a rare but potentially life-threatening condition associated with high morbidity and mortality rates. This condition typically arises from a sudden increase in intraoesophageal pressure and intrathoracic pressure. Diagnosing this condition can be challenging due to its varied clinical presentations, contributing to delay in diagnosis and poor outcomes. **Case Report:** A 45-year-old woman, previously without known medical conditions, was discovered unconscious in her home's toilet, with dark-coloured vomitus nearby. She was brought in dead to the hospital. Postmortem examination revealed a pool of brownish fluid in the left pleural cavity, stemming from a transmurular tear at the distal oesophagus. An associated focal ulcer was noted near the tear site, while no varices were observed. Additionally, findings included non-traumatic subarachnoid haemorrhages and a right renal mass. The cause of death was determined to be non-traumatic subarachnoid haemorrhage complicated by perforated oesophagus. **Conclusion/Discussion:** This case highlighted an unusual presentation and a unique sequence of events wherein a sudden oesophageal tear occurred due to forceful vomiting induced by a sudden increase in intracranial pressure resulting from subarachnoid haemorrhage. The presence of underlying local esophagitis was likely a risk factor as it weakened the oesophageal wall. The combination of factors i.e. sudden surge in intracranial pressure, forceful vomiting, and underlying oesophagitis, may explain the oesophageal tear and subsequent perforation, ultimately leading to her demise.

Insect Insights: A Retrospective Study of Entomology Cases in Sabah from 2015 to 2023

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Introduction: Forensic entomology plays an essential role in criminal investigations, primarily in post-mortem intervals (PMI) estimation. For this purpose, entomological information in local geographic regions is a prerequisite. Despite many forensic entomological studies conducted in Malaysia, much local entomological data is still lacking in Sabah. **Objective:** The study aimed to investigate the occurrence of forensically important insects associated with human remains referred to the Department of Forensic Medicine, Hospital Queen Elizabeth, Kota Kinabalu, Sabah over the last nine years (2015 - 2023). **Materials/methods:** We reviewed records of all forensic cases infested with insect specimens referred to the Department of Forensic Medicine, Hospital Queen Elizabeth, Kota Kinabalu, Sabah from January 2015 until December 2023. **Results:** A total of 170 forensic entomology cases were reviewed for this study. Insect specimens were collected from human remains recovered in varied locations in Sabah including forested areas, and suburban and urban environments, both outdoors and indoors. We recorded two orders, five families, and twelve species of forensically important insects: *Chrysomya megacephala* (Fabricius), *Chrysomya rufifacies* (Macquart), *Chrysomya villeneuvei* (Patton), *Hemipyrellia ligurriens* (Wiedemann), *Lucilia cuprina* (Wiedemann), *Hypopygiopsis violacea* (Macquart), *Calliphora fulviceps* (Van der Wulp), *Sarcophaga* spp., *Piophilidae casei* (L.), *Megaselia scalaris* (Loew), *Dermestes maculatus* (DeGeer) and *Diamesus osculans* (Vigor). **Conclusion:** Blowfly *Ch. megacephala* remains the predominant species found in the ecologically varied death scene habitats in Sabah. The study

provides supplementary insights into Malaysian forensic entomology and the distribution of forensically important flies which is pertinent to forensic science.

Diving into Manhole

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Introduction: Assessment of fatal falls requires not only autopsy, toxicological analysis and background history but also a meticulous scene examination. This is particularly important for cases that involve unusual location like a manhole. **Case report:** The discovery of a 24-year-old male in his own apartment's air vent manhole raised suspicion of dead body disposal. Scene examination was made upon request by the police. Preliminary examination at the scene revealed a fully clothed male in a fetal position with his pants slightly pulled down. A broken string was tied to his front belt loop. The broken metal cover of the manhole was found beneath the body. Further scene examination led to the discovery of the remaining string fastened to the railing at the 10th floor corridor balcony. Autopsy revealed multiple injuries consistent with fall from height. **Discussion:** Investigation of the scene and circumstances surrounding death played an important role in determining the manner of death. In this case, the absence of signs of struggle at the scene suggests that homicide is unlikely. The balcony railing height exceeding the deceased's centre of gravity makes accidental death seem improbable. Furthermore, the lack of chairs or ladders near the balcony weakens the possibility of suicide. A deeper look into the deceased's history revealed a previous attempt to climb down the balcony to enter the house, suggesting a possible misadventure. Despite that, the forensic pathologist's role at the crime scene is to assist the police. Ultimately, the manner of death will be decided by the court of law.

Fatal Attack Associated with the Big Jaw Predator

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Introduction: Crocodiles are among the deadliest wild animals in Sabah, with over 40 cases of fatal crocodile attacks reported since 2018 in the State. The increasing human-crocodile conflict has become a concern for many engaging in water activities in the recent years. The outcome of crocodile attacks is usually lethal due to mechanical injuries or drowning. Occasionally, there were incidental findings of postmortem crocodile bite marks on bodies whose deaths were not related to the attack. **Case History:** We present two cases of fatal crocodile attacks to study the pattern of injuries. One was an 8-year-old boy who was attacked by a crocodile when he was swimming in a river with his friends. His body was discovered after 3 hours in the river, 50 meters away from the place of attack. Multiple wounds resemble bite wounds were seen on the torso. The ribs and the liver underneath were crushed. The second case was an adult who was attacked by a crocodile while harvesting clams in the river. His body was discovered after 14 hours at the riverbank with all the limbs were dismembered. The cause of death in both cases were associated with drowning and traumatic injuries. **Discussion/Conclusion:** The pattern of injuries depends on the mechanism of the crocodile attacks. Crocodile bites may resemble stab wound or gunshot wound but more worrying they may obscure homicide. Analysis of circumstantial evidence, injuries and understanding of the natural habitat of wildlife are warranted before concluding cause of injuries to avoid error in the future forensic practice.

Fatal Haemorrhage from an Accidental Brachial Vessel Laceration

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Introduction: Wounds to the upper limb often suggest defensive actions in assault cases. A detailed postmortem examination and scene investigation will be critical to differentiate between defensive injuries, accidental harm, or self-inflicted wounds. Here, we present a case of an unwitnessed death due to a brachial artery laceration that was initially suspected to be homicide. **Case report:** A 74-year-old woman was found dead on a car porch, having bled profusely from multiple wounds noted on her left upper limb. During autopsy, the wounds were revealed as two upward-directed lacerations on the anterior aspect of her left arm and forearm respectively, completely transecting the underlying brachial artery, with no other injury seen. A retrospective scene investigation revealed blood tracking from the living room, where a glass tabletop had shattered. A nearby mop and a pulled-back curtain with broken hooks suggested she might have been cleaning windows before she fell on the glass tabletop and lacerated herself. **Conclusion:** While injuries to the left upper limb are common in defensive wounds, the location and morphology, being anterior and directed upwards, argue against a defensive action. These findings, along with the absence of additional injuries, suggest an accidental cause rather than homicide. The living room revealed broken glass surrounded by a pool of blood, with no disarranged furniture also support the hypothesis of an accidental fall rather than an altercation. This case emphasises the importance of comprehensive forensic approaches, holistic autopsy examination, and meticulous scene examination in accurately interpreting circumstances surrounding unattended deaths.

Geometric Morphometric Analysis of the Atlas Vertebrae in the Malaysian Population

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Introduction: Accurate identification of skeletal remains is crucial in forensic anthropology, encompassing determinations of sex, age, ancestry, and stature. The first cervical vertebra (C1, Atlas) remains understudied in this context. This study investigates sexual and population variation in C1 size and shape within the Malaysian population using a 3D geometric morphometric (GM) approach. **Materials and Methods:** 180 CT scans were acquired from the Universiti Kebangsaan Malaysia Medical Centre based on pre-defined criteria of sex, ancestry, and age distribution across the three major ethnicities in Malaysia. C1 vertebrae were segmented from CT data using 3D Slicer (v5.2.2). 27 landmarks were identified and placed on each segmented C1 using Stratovan Checkpoint (v2023.05.30.0438 WIN X64). Landmark coordinates were exported to Notepad for subsequent analysis with MorphoJ (v1.06d) and SPSS (v21). **Results:** Discriminant Function Analysis (DFA) of sex yielded accuracy rates ranging from 81.5% to 84.1%. Racial classification using DFA achieved an accuracy of up to 61.7%. Analysis of C1 shape for age estimation demonstrated limited success, with a classification accuracy of only 49.2%. **Discussion:** This study revealed that size differences were more pronounced than shape variations when comparing sexes within the sample. Males exhibited larger centroid size compared to females, translating to more flared transverse processes and bulkier posterior tubercles. Individuals in the middle-aged group tended to have larger atlases compared to younger and older age groups. These findings provide further evidence for sexual dimorphism in C1 size and shape; however, cautious interpretation is warranted due to limitations inherent to the study design.

The Grape Mess: An Autopsy Case Report

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Introduction: Hydatidiform mole (also known as molar pregnancy) is a subcategory of diseases under gestational trophoblastic disease (GTD), which originates from the placenta and can metastasize. It is unique because the tumor originates from gestational tissue rather than from maternal tissue. A hydatidiform mole is very uncommon affecting around 1 in 1,200 pregnancies. Although GTD was associated with significant morbidity and mortality, current mortality rate is almost zero in high-income nations. We present a case which highlights a death associated with GTD in our setting. **Case:** A 45-year-old Indonesian female was found dead in her home in Cameron Highland. She was diagnosed with molar pregnancy to rule out likely choriocarcinoma with metastasis to right vaginal wall a month before. Suction and curettage were done prior to discharge. However, she defaulted a scheduled repeat suction and curettage. An autopsy and histological examination revealed a vaginal mass consistent with metastatic hydatidiform mole. **Discussion:** Hydatidiform mole is usually seen in clinical settings. To date, this is probably the first death seen in the forensic setting in Pahang that is related to GTD. Prognosis of hydatidiform mole is usually good after chemotherapy but factors such as sub-par or incomplete treatment due to socio-economic factors like financial constraint and illegal immigration are some of the important elements that may contribute to death as seen in this case. Other important issues related to the case shall be discussed.

From Surface Wounds to Fatal Outcomes: Understanding the Fatal Consequences of Scalp Lacerations in Forensic Pathology

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Introduction: Scalp lacerations are commonly seen in head trauma cases, ranging from minor abrasions to severe lacerations. While these injuries are both treatable and avoidable, they continue to be a significant cause of preventable death. Although it is well-known that scalp lacerations can lead to substantial bleeding, it is less widely recognised that even seemingly scalp lacerations can be fatal. **Case report:** A 20-year-old man with no known medical illness was thrown from his motorcycle after hitting a pothole, causing his head to land on the tar road. This resulted in a scalp laceration with copious amounts of blood at the scene. Witnesses observed he was alive before the ambulance arrived, but he died minutes before resuscitation could occur. Autopsy findings revealed a full-thickness scalp laceration with ragged non-bleeding edges, measuring 7 cm long, at the left occipito-parietal region. This was accompanied by an underlying scalp hematoma measuring 10 cm in length, 7 cm in width, and 0.5 cm in depth. The skull was intact, and the brain appeared grossly normal. Both external and internal organs were notably pale, with no other findings to explain the death. The cause of death was concluded to be exsanguination due to scalp laceration due to road traffic crash, after excluding the possibility of traumatic brain injury. **Discussion:** Scalp wounds penetrating the subcutaneous layer can result in significant bleeding due to the scalp's rich blood supply. The natural tension in the scalp hinders effective hemostasis, prolonging bleeding. This can lead to life-threatening blood loss and death, highlighting that even minor-appearing scalp lacerations require immediate medical attention due to their potential fatality.

“Caught in the Blast” – Blast Injuries Manifestations in Acetylene Gas leak Explosion

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Introduction: Blast injuries are commonly associated with acts of terror using explosives. However, non-terror-related blast injuries could happen in workplace settings, like pressurised gas containers leak with the presence of sparks that ignite the gas leading to explosions. We herein report a case of explosion involving acetylene gas tank leakage. Acetylene is a colourless, non-flammable hydrocarbon, commonly used in metal welding. Meanwhile, blast injury can be classified into four main classifications- primary, secondary, tertiary and quaternary. **Case report:** A 33-year-old gentleman was allegedly involved in an explosion related to acetylene leakage while he was welding metal rods. Different manifestations of injuries resulting from the explosion are observable on the body. Primary blast injuries are evidenced by patchy subarachnoid haemorrhage, multiple ribs fracture, intercostal marking on lung surfaces and bilateral pulmonary haemorrhage. Secondary blast injury is demonstrated by presence of a large gaping laceration at the left lateral torso suggestive of contact with flying shrapnel. The body was partially complete, in the absence of waist down and limbs signifying tertiary blast injuries; through the scene investigation, it is believed that the body was thrown off, hitting a sharp metal rod rack and subsequently hit the factory wall. The burn injury of 60% of total body surface indicates the quaternary blast injury due to fire ignition in the presence of oxygen. **Conclusion:** Reconstruction of event can be made with these findings. Besides that, it is a rare occasion to have all four different manifestations of blast injuries in one fatal explosive event.

Bridge Over Troubled Heart: A Case Report of a Toddler with a Type-A partial Atrioventricular Septal Defect

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Introduction: Atrioventricular septal defects (AVSDs) are complex congenital heart defects, where the diagnosis is mostly made through echocardiography during early neonatal life. However, the incidence of discovery made during autopsy is scarce. **Case report:** This is a case of a 1-year 4-month-old boy with an otherwise uneventful ante- and post-natal period. He presented with a 2-day history of fever and an episode of seizure on the day of his death. His parents were healthcare sceptics and staunch anti-vaxxers. The autopsy revealed an under-nourished child with an enlarged globular heart, exhibiting a partial or incomplete AVSD and a common atrioventricular valve. He was in failure, as evidenced by the presence of pericardial and pleural effusions as well as ascites. Other organs were otherwise pathologically unremarkable. Nasopharyngeal swab isolated both rhinovirus and enterovirus. **Discussion and Conclusions:** AVSDs account for 4-7% of congenital heart defects, encompassing various subtypes within the spectrum. In this case report, we will explore the pathophysiology of partial AVSDs and the risk posed by concurrent viral infections, breakdown the complex anatomy of the heart defects as well as highlight the importance of a thorough post-mortem examination.

Medico-legal Perspectives of Forensic Ballistics in Indian Criminal Justice System

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Introduction: Forensic ballistics is a branch of forensic science that focuses on the examination of firearms, ammunition, and their associated evidence in criminal investigations and trials. Ballistic experts can analyse the trajectory of a bullet to determine the range of a shot, identify the type of weapon used, and provide valuable evidence that can corroborate or contradict the guilt of the accused. **Objectives:** This study aims to improve the credibility of ballistic experts' testimony by analysing the Supreme Court of India (SCI) judgments. It seeks to identify the key factors that courts consider while determining the relevance of ballistic experts' testimony and their reports. **Material and Methods:** Ballistic experts use microscopic examinations along with digitised 2D, 3D imaging, BalScan System to examine and compare fired bullets and cartridge cases. This study analyses the ballistic experts' testimony and their reports in the Indian court rulings between 1974 and 2023 using online databases. The data obtained were subjected to an ANOVA test to assess the factors that courts consider while determining the relevance of ballistic reports. **Results:** In 157 cases, 99 cases resulted in acquittal due to inconsistent ballistic reports. In 58 cases, Indian courts convicted the accused upon consistent and cogent evidence was produced. **Conclusion:** Indian courts are more likely to convict the accused upon the production of cogent ballistic evidence. It was also found that the courts acquitted due to non-examination of ballistic experts, non-production of microphotographs and other inconsistent reports.

The Last Message: Unintended Consequence – Ligature Strangulation Due To Massage Machine Misuse

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Introduction: Ligature strangulation is a form of asphyxia resulting from the application of pressure to the neck by a ligature. While commonly encountered in criminal investigations or cases of suicide, accidental ligature strangulation is relatively rare. We present a rare case report of accidental ligature strangulation caused by the misuse of a massage machine, highlighting the importance of thorough investigation and public awareness of potential dangers associated with the unconventional use of such devices. **Case Presentation:** A 77-year-old male was found unresponsive in his home by family members. He was brought to the nearest hospital and pronounced dead on-arrival. The presence of a self-modified massage machine nearby raised suspicions of accidental strangulation. Further investigation revealed that the deceased had a history of headache and had been experimenting with various techniques for self-massage using the machine and a cloth as a makeshift ligature. Post-mortem examination confirmed ligature mark consistent with strangulation around the neck. The presence of the massage machine and cloth, along with the absence of evidence suggesting foul play or suicidal intent, indicated that the death was the result of unintended consequences of self-massage. **Conclusion:** Accidental ligature strangulation due to the misuse of a massage machine highlights the potential risks associated with unconventional methods of self-treatment. While massage devices are designed to provide therapeutic relief, improper use of it can lead to fatal outcomes. This case underscores the importance of public education on safe and appropriate use of massage equipment to prevent similar incidents.

Estimating Minimum Post-mortem Interval (MPMI) Through Blowfly Succession Patterns: A Study of a Rabbit Carcass Concealed Inside a Suitcase in Indoor and Outdoor Environment at Universiti Malaysia Sarawak (UNIMAS)

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Introduction: Determining the minimum post-mortem interval (mPMI) is crucial in forensic investigations to establish the timeline of events surrounding a death. Blowflies are among the primary insects used by forensic entomologists in estimating PMI due to their predictable succession patterns. This study examines blowfly succession patterns on a rabbit carcass concealed inside a suitcase in indoor and outdoor environments at UNIMAS to determine the mPMI. **Objectives:** The study aims to contribute to the understanding of insect-mediated decomposition processes in tropical regions and provide insights into forensic entomology methodologies applicable to local contexts. **Methodology:** A rabbit carcass was concealed inside a suitcase and was placed in both indoor and outdoor locations. Total of 656 larvae and adult blowflies were collected, identified and their succession patterns were monitored using standardized sampling methods. **Results:** Blowfly colonisation of the rabbit carcass followed a predictable succession pattern. The development of blowfly larvae correlated with environmental conditions, with longer rates of development observed in indoor environments (96-hours), compared to outdoor environments (72-hours). This is due to a delay in the oviposition off eggs between the zips teeth of the suitcase. The mPMI was estimated based on the developmental stage of blowfly larvae and environmental factors. **Conclusion:** Estimating the mPMI through blowfly succession patterns provides valuable information for forensic investigations. The influence of environmental factors on blowfly development underscores the importance of considering local conditions in forensic entomology investigations. The results of this study can be used to enhance the accuracy of mPMI estimation in diverse environmental contexts.

Forensic Analysis of Death in an Incomplete Decomposed Body with Metal Chain Over the Leg Recovered from Water

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Introduction: The discovery of an incomplete decomposed body, often submerged in water presents a significant challenge to forensic pathologists. In Sarawak, such cases commonly related to predator attacks like crocodile requires meticulous examination and analysis to reconstruct the events leading to the victim's death. We present a case report of an incomplete decomposed body found in water, with a metal chain around the leg. **Case Report:** A report was received by local authorities regarding the discovery of an incomplete human body at a private jetty. Postmortem examination revealed a partially decomposed human body lacking a head, arms, and upper thorax, with extensive lacerations on the remaining lower limbs and trunk consistent with a crocodile attack, with a metal chain fastened around the right foot attached with a padlock and steel snap-hook. DNA analysis confirmed the identification of the deceased as a 28-year-old man with a history of depression and financial troubles. He was known to borrow money and had been involved in brawls with loan sharks in the past. **Conclusion/Discussion:** This case showcases the intricate forensic analysis to unravel the mystery of the individual's perplexing death. The metal chain around the right foot suggests deliberate action, possibly self-inflicted, though the absence of upper limbs cannot exclude criminal element as the varying positions of upper limbs could shed light in determining the manner of death. The investigation offers valuable insights into the sequence of events leading to the victim's demise, underscoring the importance of forensic examination in unravelling complex cases.

Suicide by Helium Inhalation

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Introduction: The number of suicides by gas inhalation has increased significantly around the globe. However, previous data in Malaysia recorded no incidence of suicide by helium as of mid-2016. Helium is one of the most common inert gases of choice for suicide by gassing. Suicide by helium gas inhalation is known to produce quick, painless death. **Case:** A 37-years-old man with no known pre-morbid was found unconscious on the sofa by his wife in their house 30 minutes after he sent a farewell message to his wife. He was found with a plastic bag taped over his face, with a tube attached to a helium gas container beside him. Post-mortem examination showed insignificant gross pathological findings while the toxicological findings were unremarkable. **Discussion:** In the absence of pathognomonic gross pathological findings, toxicological analysis is of great help to dictate the cause of death. In previous studies, toxicological analysis such as gas chromatography coupled with mass spectrometry (GC-MS) and liquid chromatography-tandem mass spectrometry (LC-MS/MS) were used to identify the presence of helium. However, such sophisticated tests are not available in our setting. Therefore, the diagnosis is made purely based on circumstances instead of toxicology findings. **Conclusion:** Suicide by helium may not show obvious finding during post-mortem which could help determine the cause and manner of death. Advanced toxicological analysis is crucial to confirm the presence of helium prior to death. However, in a setting with impermissible for such test, the cause of death requiring careful consideration of surrounding circumstances.

Aortic Dissection: Rare Presentation of Fibromuscular Dysplasia

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Introduction: Fibromuscular dysplasia is a non-atherosclerotic, non-inflammatory systemic vascular disease, primarily affecting small and medium-sized arteries. It most commonly affects the renal and carotid arteries. However, it can also involve other arteries such as the axillary, iliac, basilar, hepatic and intracranial arteries. It predominantly manifests in women aged between 30 and 50 years. We present a rare case of fibromuscular dysplasia involving the aorta, complicated by type A aortic dissection. **Case Presentation:** A healthy 32-year-old overweight lady with no history of trauma was brought in dead to the hospital with history of sudden chest pain and shortness of breath. An autopsy was conducted within 24 hours of a well-preserved body revealed massive haemopericardium due to ruptured ascending aortic dissection. Histological examination of the aorta and the vessels of the heart and kidney were consistent with fibromuscular dysplasia. The infectious screening was negative with no evidence of vasculitis. She had co-existent mild, uncomplicated atherosclerosis with absence of hypertensive and diabetic nephropathy changes. **Conclusion:** The gold standard of diagnosis for fibromuscular dysplasia is histology, categorising it into three types based on the layer of the arterial wall most affected (intima, media, or adventitia). Typically, affected arteries exhibit primary occlusion, accompanied by secondary complications like aneurysm, dissection, and arteriovenous fistula. Thus, forensic pathologists must recognise the range of observations in fibromuscular dysplasia and its similar conditions, given their diagnostic significance.

Beyond the Noose: Investigating Hanging with Extensive Blunt Force Injuries- a Case Report

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Introduction: Hanging is a well-recognised method of suicide and is characterised by constriction of the neck resulting in asphyxia. However, in some cases, hanging may be complicated by additional injuries such as blunt force trauma, leading to complexities in determining the manner of death. The presence of blunt force injuries raises questions regarding whether they occurred before, during, or after the hanging event, necessitating a thorough investigation to establish the sequence of events and ascertain the manner of death. **Case Presentation:** A 22-year-old lady found deceased with extensive blunt force injuries in addition to evidence of hanging. The individual was discovered suspended by a ligature tied around the neck in a private residence, indicative of hanging. However, accompanying this finding were multiple contusions on various body regions. Through comprehensive autopsy, scene examination, and toxicological analysis, the sequence of events leading to the individual's demise was elucidated. The autopsy revealed ligature marks consistent with hanging, alongside evidence of subcutaneous haemorrhage and soft tissue trauma corresponding to external injuries. Scene investigation provided no indications of struggle or forced entry, supporting the possibility of self-inflicted injuries. **Conclusion:** In cases involving hanging with extensive blunt force injuries, a multidisciplinary approach encompassing forensic pathology, toxicology, and scene investigation is crucial for accurate determination of the manner of death. Despite the complexities presented by multiple mechanisms of injury, a comprehensive analysis of the findings can elucidate the sequence of events leading to the individual's demise. In this case, based on the collective evidence, the manner of death was determined to be suicide by hanging with contributing blunt force injuries.

Bleeding Heart – Aortic Dissection Sequelae with Bicuspid Aortic Valve: A Case Report

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Introduction: Bicuspid aortic valve (BAV) is one of the most common congenital aortic valve anomalies affecting approximately 1 to 2% of the general population. It is one of the major risk factors for aortic dissection which has a fatal outcome if it ruptures. The risk of aortic dissection incidence increases ninefold at a younger age with BAV. The pathophysiological aspect of aortic consequences in BAV was considerably controversial but attributable to haemodynamic factors, aortopathy and cystic medial degeneration. This case report highlights the complication of BAV causing rupture of an aortic dissection. **Case description:** A 36-year-old man was found dead in the bathroom of his house. Autopsy was performed and revealed a massive haemopericardium due to ruptured aortic dissection. Examination of the heart also revealed congenital anomalies of bicuspid aortic valve and atrial septal defect. A horseshoe-shaped kidney was also noted. The cause of death was certified as cardiac tamponade due to haemopericardium secondary to ruptured aortic dissection. Microscopically, the aortic dissection showed features of aortitis and cystic medial degeneration of the aortic wall with hypertensive changes in the kidney. **Conclusion:** This young obese individual likely had an underlying hypertension. While hypertension has no direct causal relationship with BAV, aortic dissection is a known complication of BAV in young individual. We demonstrate the important autopsy and histopathological findings of BAV and its fatal complications.

The Neglected One: Autopsy Case Reports

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Introduction: The spleen is the largest lymphoid tissue in the human body, anatomically located on the left side of the abdomen, between the gastric fundus and diaphragm. Its function varies from filtration of foreign matter to participation in immune response to blood-borne antigens. Despite the various functions, surgical removal of this organ is still possible without causing serious harm to the body. Therefore, the examiners tend to overlook this organ during autopsy. The following cases highlight the role of the spleen in death causation and diagnosis. **Case report:** A 24-year-old male with no known medical problem who had a history of severe headache, loss of appetite and significant loss of weight 1 month prior to death. He was investigated by the neuromedical team as an in-patient but defaulted as the family claimed he was afflicted with 'santau' (black magic). Postmortem examination revealed abscesses over the neck muscles associated with surrounding tissue necrosis and atypical splenic lesions. An 11-year-old boy who was hit by a soccer ball at the left side of the abdomen during a game. Autopsy showed massive hemoperitoneum due to ruptured splenomegaly with underlying undiagnosed haematological malignancy. **Conclusion:** During an autopsy, the spleen tends to be left out from thorough examination compared to other major organs such as the heart, lungs and brain even though the organ is vulnerable to various disorders. Sometimes it may not be fatal or cause death directly but plays a huge role in contributing to death. Other issues related to the cases shall be discussed.

A 5-Year Retrospective Analysis of Medicolegal and Clinical Post-mortem Cases in Which Histology and Laboratory Investigations Were the Primary Sources Facilitating the Conclusion of the Cause of Death in Penang General Hospital

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Introduction: A post-mortem involves a meticulous external and internal examination and performing necessary ancillary investigations on a deceased body to ascertain or aid in conforming or negating a cause of death. **Objectives:** This study aims to analyse the number of cases concluded with the assistance of histology and laboratory investigations such as toxicology, microbiology, biochemistry and virology analysis; determining the most frequent modality that assisted in concluding the cause of death; deducing the manner of death for departmental-level statistics and discussing the importance and limitations of ancillary investigations. **Material and methods:** A retrospective analysis of medicolegal and clinical post-mortem cases at the Department of Forensic Medicine in Penang General Hospital between 2019 and 2023 was conducted. The cases that were included are natural and non-traumatic suicidal and accidental deaths. The cases that were excluded are traumatic deaths including decomposed cases, cases where the findings of the ancillary investigations corroborated the gross autopsy findings, negative autopsies and deaths attributed to coronavirus infection. **Results:** 435 (12.2%) cases were identified from 3563 cases. Histology examination facilitated the conclusion of 300 (68.9%) cases; laboratory analysis facilitated 59 (13.5%) cases, whereas both modalities facilitated 38 (8.73%) cases. The most common manner of death was natural in 387 (88.9%) cases, followed by accidental or misadventure in 27 (6.2%) and suicide in 21 (4.8%) cases. **Discussion:** This study demonstrates the importance of ancillary investigations. It should trigger larger-scale research in hospitals with in-house histopathology, computed tomography (CT) scan facilities or a large prospective cohort of post-mortem cases.

Lost Opportunities: Preventing Maternal Mortality Through Comprehensive Care for Pregnancy Related Headaches

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Introduction: There are many common complaints during pregnancy. Severe headaches in pregnancy are highly correlated to blood pressure or migraines. Due to these common complaints, practitioners may miss other diagnoses that can lead to maternal mortality, something that needs to be avoided at all costs. *Case:* This is a case report of a 42-year-old female with no medical illnesses. She was 20 weeks pregnant and complained of persistent severe headaches for two weeks. She sought medical attention at the same clinic for three times during that period, however, the treatment remained the same and no referral was made due to normal blood pressure readings. Later, she was found unconscious by her husband during sleep and subsequently was pronounced dead. During the autopsy, the brain was oedematous and haemorrhagic ischaemic changes were observed in the right temporal lobe with extensive intraventricular haemorrhage. No hypertensive changes, any evidence of artery-venous malformations or aneurysms were seen grossly. However, histological examinations of the brain showed evidence of artery-venous malformations, with some vessels already ruptured, consistent with intracerebral bleeding found in gross findings. Special staining, Elastin van Gieson (EVG) confirmed the findings. *Discussion and conclusion:* Headaches are one of the most common complaints among patient attending primary care. However, a change in severity and persistent symptoms, especially in a pregnant woman, warrants further investigation by a doctor, including timely referral to avoid significant morbidity and mortality.

A Case of Post-intubation Tracheal Stenosis

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Introduction: Tracheal stenosis following an endotracheal intubation is a rare but deadly event. Somehow, no matter how short or long the duration of the intubation was, patients were bound to have various degrees of airway injuries. *Case report:* We report a case of fatal tracheal stenosis in a young lady, following an intubation after she had a road traffic crash and suffered multiple cervical bone fractures. She was intubated for a few days and was subsequently discharged well. At home, she had multiple episodes of respiratory distress and she had to be sent to the hospital where she had to be intubated again. She was finally discharged home despite having persistent stridor. She then had another episode of respiratory distress, causing her to collapse and succumb to her death. Post-mortem examination findings showed severe narrowing of the tracheal lumen with pooling of secretions in the lower airway. The cause of death was given as tracheal stenosis. *Discussion:* Forensic pathologists need to be able to carefully do a thorough examination of the neck structure during post-mortem when dealing with cases where a history of intubation is apparent. The role of post-mortem computed tomography (PMCT) will also be discussed as an important adjunct in determining the diagnosis.