10th Czech-Slovak Congress of Forensic Medicine

15th–17th April 2026
Hotel Harmony
The Giant Mountains, Špindlerův Mlýn

PROGRAM HANDBOOK

Organizer:
The Czech Society for Legal Medicine and Forensic Toxicology of the Czech Medical Association of Jan Evangelista Purkyne

Conference organizer:
Congress Prague s.r.o.

PARTNERS AND EXHIBITORS

GENERAL PARTNER AND PARTNER OF THE REGISTRATION

PARTNER

SUPPORT

EXHIBITORS

BASIC INFORMATION

ORGANIZER:
The Czech Society for Legal Medicine and Forensic Toxicology of the Czech Medical Association of Jan Evangelista Purkyne

ORGANIZING COMMITTEE:
prof. MUDr. Petr Hejna, Ph.D., MBA
MUDr. Bc. Štěpánka Pohlová Kučerová, Ph.D.
RNDr. Martin Mžik, Ph.D., MBA

CONFERENCE ORGANIZER:
Congress Prague s.r.o.
Vyšehradská 430/41
128 00 Prague 2
www.congressprague.cz
office@congressprague.cz

Person responsible for the organizational arrangements of the congress:
Petra Skalová
Tel.: +420 774 923 353
petra.skalova@congressprague.cz

Coordinator for partners and exhibitors (pharmaceutical companies):
Bohumil Sedlák
Tel.: +420 605 781 945
exhibitors@congressprague.cz

Coordinator for registration and accommodation:
Silvie Krejsková
Tel.: +420 775 948 924
silvie.krejskova@congressprague.cz

CERTIFICATES

The educational event is organized in accordance with Regulation No. 16 of the Czech Medical Chamber. Registered participants who complete the professional program will receive an electronic certificate worth **10 credits**, valid within EU countries, sent to their email address within 14 days after the event.

ACCOMPANYING PROGRAMME

Lunch – April 16, Lunch – April 17
Lunch is served as a buffet at the congress venue.
Congress lunches are not included in the registration fee.
Price: CZK 550 including VAT (with a non-alcoholic drink).

Dinner – April 15
Time: 20:00
Venue: Hotel Harmony Club
Price: CZK 750
Entry upon presentation of a purchased ticket.

Gala Dinner – April 16
Time: 19:00
Venue: Hotel Harmony Club
Price: CZK 1,200
Entry upon presentation of a purchased ticket.

The social dinner is not part of the official congress program and is not funded by pharmaceutical sponsors. Participation requires purchasing a ticket in advance during registration or on-site at the registration desk by April 16, 2026, 12:00. The number of tickets is limited by venue capacity.

RULES FOR PARTICIPATION

- Entry to the congress and accompanying exhibition is only possible with valid registration.
- Each registered participant will receive a badge upon entry.
- A staffed cloakroom is available during congress hours.
- Outside working hours, congress halls are closed. Do not leave personal belongings unattended. The Hotel Harmony Club, organizers, and congress organizers are not responsible for damage or loss.
- Items brought and used during the congress are not insured.
- Participation and movement within the congress premises are not covered by personal insurance.
- Smoking is strictly prohibited in all congress areas. Please respect this rule.
- Recording (audio or video) is not permitted without explicit consent from the organizer.

ORIENTATION MAP OF THE PARTNERS' EXHIBITION AREA

	EXHIBITOR
1.	1. KORONERSKÁ s.r.o.
2.	Waters GmbH, organizační složka
3.	INTES, s.r.o
4.	MEDISTA spol. s r.o.
5.	bamed s.r.o.
6.	Pragolab s.r.o.
7.	AUREL CZ s.r.o.
8.	ZENA-R, spol. s.r.o.
9.	BARIA, s.r.o.
10.	GALÉN, spol. s r.o.

PROGRAM

Wednesday, 15th of April

09:30 – 11:30	Board of the Czech society of forensic medicine and forensic toxicology	
11:00 – 19:00	Registration	
15:00 – 15:20	**Slavnostní zahájení / Opening ceremony – Velký sál / Main hall**	
15:20 – 16:40	**I. Blok – Velký sál / Session I. – Main hall** Zobrazovací metody/ Forensic imaging Vyžádané přednášky / Invited speakers / Key note lecture **Předsedající sekce / Session chair:** Bohnert M., Farkašová Iannaccone S.	
	The role of multiphase postmortem CT angiography in medicolegal death investigation Grabherr S.	30 min.
	Discussion	10 min.
	Postmortem CT in forensic medicine: ten years later – gains, limits and lessons learned Hejna P.	30 min.
	Discussion	10 min.
16:40 – 17:00	**Coffee Break**	
17:00 – 17:45	**II. Blok – Velký sál / Session II. – Main hall** Zobrazovací metody / Forensic imaging **Předsedající sekce / Session chair:** Esposito M., Hirt M.	
	Multi-phase postmortem computed tomography angiography (MPMCTA) in forensic routine: A 50-case institutional experience Pohlová Kučerová Š., Kovařík D., Zátopková L., Volt M., Břízová P., Pojar M., Rejtar P., Draganovičová J., Hejna P., Manďák J.	10 min.
	Postmortem CT angiografické vyšetření z pohledu perfuzionisty aneb jak to začalo… Volt M., Pojar M.	10 min.
	Prototype scanner Forescan® 3D dedicated to forensic practice Hamříková P., Čapek L., Vitvar J.	10 min.
	Discussion	15 min.
17:45 – 18:00	**Break**	
18:00 – 19:20	**III. Blok – Velký sál / Session III. – Main hall** Přehledová sdělení/ Review **Předsedající sekce / Session chair:** Vorel F., Sokol M.	
	Infarktu myokardu je lepší předejít… a je to možné! Vrablík M.	20 min.
	Legal aspects of the relationship between medical and forensic autopsies in Czech practice Šolc M.	10 min.

	Jak odčítat paušální hodnoty od výsledků dechové zkoušky na alkohol Hirt M., Vorel F., Straka Ľ., Vavera F., Vojtíšek T.	15 min.
	Poisoning homicide – historical milestones, methods, key figures Straka Ľ., Jurášeková P., Janík M., Rybárová V., Sivulič R., Martináková P.	20 min.
	Discussion	15 min.
19:20 – 20:00	**Welcome drink and refreshment** Foyer and Lobby bar	
20:00	**Dinner** Restaurant hotel Harmony Dinner is not included in the congress program.	

Thursday, 16th of April

09:00 – 10:20	**IV. Blok – Velký sál / Session IV. – Main hall** Vyžádané přednášky / Invited speakers **Předsedající sekce / Session chair:** Grabherr S., Hejna P.	
	Reconstructive aspects in the investigation of fire deaths Bohnert M.	30 min.
	Discussion	10 min.
	Artificial intelligence in forensic pathology Esposito M.	30 min.
	Discussion	10 min.
10:20 – 10:40	**Coffee break**	
10:40 – 11:50	**V. Blok – Velký sál / Session V. – Main hall** Forensic suicidology and traffic accidents / Soudnělékařská fenomenologie sebevražedného jednání a dopravní úrazy **Předsedající sekce / Session chair:** Ťažký B., Šafr M.	
	Forensic value of internal injuries in hanging: results of a 10 – year prospective study and new insights Kuruc R., Neszméry M., Nižnanský Ľ., Šikuta J., Mikulášová D., Szórádová A.	10 min.
	Suicide notes and suicide methods: quantitative associations between note structure and method profiles Šafr M., Lochmannová A.	10 min.
	Novel aortic lesions in hanging deaths: preliminary data Kovařík D., Pohlová Kučerová Š., Sivulič R., Zátopková L., Janík M., Straka Ľ., Hejna P.	
	Homicide–suicide in the eastern part of the Czech republic: a retrospective regional study (1998–2023) Svrchokryl V.	10 min.

	Head-on collision as the final phase of a homicide–suicide event: a forensic reconstruction of a case Bízik J., Štuller F., Straka Ľ.	10 min.
	Fatal injuries in scooter accidents – a forensic analysis of three cases Mikulášová D., Neszméry M., Kuruc R., Šikuta J., Szórádová A.	10 min.
	Impact direction and injury severity in a train-to-train collision: a forensic case series of 75 survivors Štuller F., Bízik J., Rybárová V., Sivulič R., Straka Ľ., Kolla E.	10 min.
	Discussion	10 min.
10:40 – 12:00	**VI. Blok – Malý sál / Session VI. – Small hall** Náhlá srdeční smrt / Sudden cardiac death **Předsedající sekce / Session chair:** Tomášek P., Markvartová J.	
	Náhla srdcová smrť a možnosti post-mortem genetického vyšetrenia na Slovensku Grünnerová L., Petrovič R., Vojvodová M., Konečný M., Krebsová A., Illíková V.	15 min.
	Autopsy guidelines for aortic dissection: review of the literature Pohlová Kučerová Š., Zátopková L., Hlaváčková A-M., Krebsová A.	10 min.
	Fatal non-traumatic aortic pathologies: 5-years retrospective study Hlaváčková A-M., Pohlová Kučerová Š., Zátopková L., Kovařík D., Ublová M., Šafr M. Hejna P.	10 min.
	Akutní disekce aorty, její dědičné příčiny a možnosti prevence; přesah pitevních nálezů do klinické péče o pozůstalé v riziku Krebsová A., Votýpka P., Tománková S., Peldová P., Gardáš D., Adamová M., Szarszoi O., Pirk J., Macek M., Kautzner J.	15 min.
	Detection of myocardial apoptosis using the TUNEL assay in sudden deaths with emphasis on arrhythmogenic ventricular cardiomyopathy Farkaš D., Tóth Š., Ginelliová A., Maretta M., Vasovčák P., Farkašová Iannaccone S.	10 min.
	Nečekané fatální krvácení u Marfanova syndromu Makuša M.	10 min.
	Discussion	10 min.
12:00 – 13:00	**Lunch**	
13:00 – 14:20	**VII. Blok – Velký sál / Session VII. – Main hall** Vyžádané přednášky / Invited speakers **Předsedající sekce / Session chair:** Handlos P., Čabala R.	
	Shokry D.	30 min.
	Discussion	10 min.
	Analytical methods in doping control Nováková L., Nicoli R., Veuthey J-L., Guillarme D.	30 min.
	Discussion	10 min.
14:20 – 14:40	**Break**	

14:40 – 15:45	**VIII. Blok – Velký sál / Session VIII. – Main hall** Využití laboratorních metod v soudním lékařství / Laboratory methods in forensic medicine **Předsedající sekce / Session chair:** Vlčková A., Kuruc R.	
	Time of death determination by analysis of glyceraldehyde 3-phosphate dehydrogenase degradation Sivulič R., Samec M., Samec I., Straka Ľ., Janík M.	10 min.
	Anaphylaxis as a cause of sudden and unexpected death Vácha A., Krajsa J., Mičánková L., Hliboká M., Kalinka Grusová T., Vojtíšek T.	10 min.
	Možnosti imunohistochemické detekce ischemie myokardu v časném postmortálním intervalu Čegan M.	10 min.
	Imunohistochemický průkaz CD68-pozitivních makrofágů v plicích při protrahované hypoxii Toupalík P., Šimková J., Karásková L., Koubová M.	10 min.
	Subendokardiálne krvácania v súdnolekárskej praxi – mechanizmus vzniku, vplyv KPR a potreba štandardizovaného hodnotenia Martináková P., Janík M., Straka Ľ.	10 min.
	Discussion	15 min.
14:40 – 15:45	**IX. Blok – Malý sál / Session IX. – Small hall** Forenzní toxikologie I / Forensic toxicology I **Předsedající sekce / Session chair:** Ondra P., Mžik M.	
	Neznámé látky, reálná rizika: jak zvládáme držet krok? Chomynová P., Grohmannová K.	20 min.
	Pracoviště forensní chemie Policie České republiky Královéhradeckého kraje a jeho spolupráce s Ústavem klinické biochemie a diagnostiky Fakultní nemocnice v Hradci Králové Halamek M.	20 min.
	From party to postmortem: fatal poppers methemoglobinemia Gavronová A., Vitovják M., Pilnaj D., Stoklas M.,Ondra P.	10 min.
	Discussion	15 min.
15:45 – 16:00	**Coffee break**	
16:00 – 17:25	**X. Blok – Velký sál / Session X. – Main hall** Forenzní balistika a forenzní patologie násilné smrti (střelná, ostrá a tupá poranění) / Forensic ballistics and forensic pathology of violent death (gunshot, sharp and blunt trauma) **Předsedající sekce / Session chair:** Dobiáš M., Straka Ľ.	
	Suicide commited with a homemade firearm with electrical initiation Šafr M., Kovařík D., Ublová M.	10 min.
	Úkladná vražda s viacnásobným strelným poranením Kováč M., Girašková O.	10 min.

	Slovak roulette Kutiš E., Petránová R., Kováč M., Ťažký B.	10 min.
	The lethal reach of the table knife: a case of transorbital penetrating brain injury Kováč P., Rudnay M., Moravanský M., Očko P.	10 min.
	Off the wall Hamerlik L., Gavronová A., Spurná J., Ondra P.	10 min.
	Vražda zapísaná v kostiach / Murder recorded in the bones Zdarilek M., Kóša R., Bohoňová B.	10 min.
	Využití balistických pomůcek pro potřeby záchranných služeb Petr S. Sponzorovaná přednáška firmy Firma ARGUN s.r.o.	10 min.
	Discussion	15 min.
16:00 – 17:05	**XI. Blok – Malý sál / Session XI. – Small hall** Úmrtí v dětském věku / Death in childhood **Předsedající sekce / Session chair:** Farkaš D., Toupalík P.	
	Children as a nuisance Ublová M., Šafr M.	10 min.
	Neobvyklý mechanismus třesení Vlčková A.	10 min.
	An unexpected finding in the bushes Briškárová V., Farkašová Iannaccone S., Labaj P.	10 min.
	Idiopathic neonatal hepatitis: clinical and pathomorphological analysis Hai R., Bajaj J., Bizik J., Babiak F., Janik M., Straka L.	10 min.
	Between scent and silence: death following deodorant inhalation Štufka V., Toupalík P., Židková M.	10 min.
	Discussion	15 min.
19:00	**Gala dinner hosted by the professional society** Dinner is not included in the congress program. To attend, it is necessary to purchase a ticket.	

Friday, 17th of April

09:00 – 09:45	**XII. Blok – předsálí / Session XII. – Lobby** **Moderovaná posterová sekce / Poster session** **Předsedající sekce / Session chair:** Sokol M., Zátopková L.

1. **Unseen trajectories: multimodal reconstruction of a cervical gunshot injury without a retained projectile**
   Barletta C., Pinacchi M.P., Francaviglia, M., Chisari, M., Di Mauro L.
2. **Hide and seek with a bullet: when judicial inspection becomes essential**
   Pantè G.G., Ministeri F., Vanaria F., Mauro L., Chisari M.

3. **Silent toxicity at sea: forensic lessons from two btex-related migrant deaths in a confined ship hold**
   Francaviglia M., Francaviglia F., Pante G.G., Chisari M., Esposito M.
4. **Fatal neurotoxicity after intraventricular gadolinium: forensic insights from a sentinel healthcare error**
   Pinacchi M.P., Di Natale V., Franco S., Vanaria F., Esposito M.
5. **Aplikovateľnosť DLLME pre extrakciu xenobiotík z moču; DLLME ako alternatíva klasickej LLE**
   Jurášeková P., Čajdova J., Straka Ľ.
6. **The fatal intersection of chronicity and acuity: a forensic analysis of sudden cardiac death in polysubstance abuse**
   Di Natale V., Cotroneo A.D., Carnazza G., Pantè G.G., Ragazzi G., Barbera N.
7. **When bone fragility clouds the forensic picture: disentangling suspected osteogenesis imperfecta from abuse in a case of shaken baby syndrome**
   Ministeri F., Pante G.G., Francaviglia M., Salerno M., Esposito M.
8. **Fatal high-energy falls: multimodal forensic assessment and current advances in pmct-guided injury reconstruction**
   Cotroneo D.A., Pinacchi M.P., Barletta C., Franco S., Di Mauro L.
9. **Fall or sudden cardiac death? A rare subvalvular origin of the right coronary artery revealed at autopsy**
   Di Natale V., Barletta C., Ministeri F., Chisari M., Esposito M.
10. **Thyroid colloid depletion and follicular activation in fatal hypothermia: two illustrative cases**
    Zátopková L., Pohlová Kučerová Š., Kovařík D., Janík M., Hejna P.

09:00 – 09:55	**XIII. Blok – Velký sál / Session XIII. – Main hall** Sponzorované přednášky / Sponsored lectures **Předsedající sekce / Session chair:** Vojtíšek T., Gebauerová V.	
	Možnosti spolupráce koronerů a soudního lékařství Tuček D. Sponzorovaná přednáška firmy 1. KORONERSKÁ s.r.o.	30 min.
	Discussion	5 min.
	Clinical applications specialist at waters clinical (germany): xevo MRT forensic toxicology screening solution (angličtina) Fielitz D. Sponzorovaná přednáška firmy Waters GmbH	15 min.
	Discussion	5 min.
10:00 – 11:10	**XIV. Blok – Velký sál / Session XIV. – Main hall** Vyžádané přednášky / Invited speakers **Předsedající sekce / Session chair:** Janík M., Pohlová Kučerová Š.	
	Selected ethical aspects of current forensic medical practice Farkašová Iannaccone S.	20 min.
	Discussion	10 min.

The Bayesian approach in forensic medicine
Vojtíšek T. 30 min.

Discussion 10 min.

11:10 – 11:25 **Coffee break**

11:25 – 12:35 **XV. Blok – Velký sál / Session XV. – Main hall**
Úmrtí při zásahu či zadržení osob / Death during lawful restraint
Předsedající sekce / Session chair: Tomášková E., Kováč P.

Problematic aspects of methodological procedures in law enforcement interventions
Habich L., Najman T., Grepl L., Neureutterová K., Hlaváčová K., Víšek J., Bajura J., Dlouhý D., Vlasák J., Lopot F., Kynčl M., Otáhal J., Kubový P., Dobiáš M. 30 min.

Mechanisms of death during lawful restraint: A forensic analysis of functional vital failure
Dokoupil M. 25 min.

Discussion 15 min.

11:25 – 12:35 **XVI. Blok – Malý sál / Session XVI. – Small hall**
Forenzní toxikologie II / Forensic toxikology II
Předsedající sekce / Session chair: Černá I., Nižňanský L.

Mushrooms, gummies and hallucinogen: LC-MS/MS analysis of muscimol
Papoušek R., Staňková M., Gebauerová V., Šištík P. 10 min.

Komerční drogy jako doplněk stravy?
Čabala R. 10 min.

Nepřímé hluboké chemické popáleniny vyvolané uhlovodíky po masivním požití xylenu a benzínu v ústech: Unikátní případ bez přímého vystavení kůži
Čabala R., Kafka P., Bakalář B. 10 min.

Postmortem distribution of 2-FMA and 3-FEA, novel amphetamine analogues in a fatal poisoning case
Nižnanský Ľ., Nižnanská Ž., Šikuta J., Kuruc R. 10 min.

Analýza hladin amiodaronu u zemřelých
Vlčková A., Novotná Rychtecká A., Kotschwarová J., Marek M., Miškovská K. 10 min.

Discussion 10 min.

12:35 - 12:45 **Break**

12:45 – 14:10 **XVII. Blok – Velký sál / Session XVII. – Main hall**
Přehledová sdělení a původní práce / Review and original study
Předsedající sekce / Session chair: Hejna P., Farkašová Iannaccone S.

The boundaries of objectivity: methodological errors and ethical dilemmas in forensic medical expertise
Kováč P., Moravanský N., Neszméry M., Laciaková L. 10 min.

I felt like death was imminent: Medicolegal implications of non-fatal strangulation
Janík M., Straka Ľ., Hejna P. 10 min.

Forenzní anatomie jazylky
Pažinová J., Hejna P. 10 min.

Forensic investigation of a diving fatality: scope and limits of underwater reconstruction
Rybárová V., Novomeský F., Prygl R., Šejba J. 10 min.

Retrospective analysis of hypothermia-related deaths
Neszméry M., Szórádová A., Mikulášová D., Šikuta J., Kuruc R. 10 min.

Organ weight reference values in the adult Slovak population: A forensic autopsy study of nearly 3,000 cases
Babiak F., Janík M., Straka Ľ. 10 min.

Forensic medicine and anthropology in South Africa: a personal experience
Hanzelyová K., Straka Ľ., Janík M. 10 min.

Discussion 15 min.

14:15 **Slavnostní ukončení / Closing ceremony**

14:20 **Lunch**

ABSTRACTS

Session I.

The role of multiphase postmortem CT angiography in medicolegal death investigation

Grabherr S.

Modern Post-Mortem Imaging, especially Post-mortem Computed Tomography (PMCT) is increasingly used in forensic death investigations. In some countries and centres, it has already become a routine investigation while in other centres, its application is limited to specific cases according to local and national guidelines. PMCT is revealing al lot of information, especially concerning the skeletal system and the presence of gas inside a body. It is therefore highly indicated in cases of trauma. It's drawbacks however are the absence of contrast in organs and other soft tissue. Those limitations can be overcome by injecting a contrast agent, and therefore, by performing Post-mortem Angiography, revealing additionally the vascular system.

In the last decades different methods have been developed for performing post-mortem angiography. The most cited and mostly applied technique today is the so-called Multi-Phase Post-mortem Angiography (MPMCTA). This standardized technique was developed in the University Centre of Legal Medicine Lausanne-Geneva and validated by the Technical Working Group for Post-mortem Angiography Methods (TWGPAM). It allows a complete perfusion of the vascular system (arterial and venous) from the head to the extremities. Recommendations exist, helping to interpret the obtained images.

By applying MPMCTA and exploring the vascular system, pathological changes and malformations of vessels can be detected. Therefore, vascular occlusions, stenosis and ruptures can be diagnosed. This is especially interesting for medico-legal death investigations, where cases of sudden death, cases of medical malpractice and traumatic cases are to be examined. The extravasation of contrast agent along a trajectory renders this technique particularly useful for reconstructions of cases showing ballistic or sharp trauma.

This presentation will give an overview of the application of MPMCTA in forensic death investigations, starting with technical aspects concerning the performance of the method and the radiological interpretation of the images, and ending with its indications, advantages and limitations.

Postmortem CT in forensic medicine: ten years later – gains, limits and lessons learned...

Hejna P.
Department of Forensic Medicine, Faculty of Medicine in Hradec Králové, Charles University, Hradec Králové
Department of Forensic Medicine, University Hospital Hradec Králové, Hradec Králové

Background: Over the past decade, postmortem computed tomography (PMCT) has evolved from an experimental method into a routine tool in forensic medicine. The key question is no longer whether to use PMCT today, but how to use it effectively.

Aim: To evaluate ten years of routine PMCT use and to identify its real diagnostic value, limitations, and key factors influencing its effective implementation in forensic medical practice.

Material and Methods: A retrospective analysis of nearly 2,000 PMCT examinations (2015–2025) at a high-volume university forensic department was performed, focusing on diagnostic contribution, workflow integration, and correlation with autopsy findings.

Results: PMCT proved highly effective in detecting skeletal injuries, gas collections, foreign bodies, and ballistic trauma, while improving documentation and guiding autopsy strategy. Its limitations—particularly in soft tissue evaluation—remained evident. The main challenges were not technical but methodological, including inconsistent correlation with autopsy, variability in interpretation, and communication gaps within the team. Importantly, the absence of widely accepted guidelines and standardized examination protocols contributed to

heterogeneity in practice and interpretation. A structured workflow based on pre-autopsy evaluation, continuous correlation, and post-autopsy re-assessment emerged as critical for reliable use.

Conclusion: PMCT does not replace autopsy—it reshapes it. Its value lies not in its availability, but in how it is used. Without structured workflow, interdisciplinary collaboration, and systematic correlation with autopsy findings, its diagnostic reliability remains limited. Standardization is therefore essential for its effective and meaningful integration into forensic medical practice.

Session II.

Multi-phase postmortem computed tomography angiography (MPMCTA) in forensic routine: the 50-case institutional experience

Pohlová Kučerová Š.[1], Kovařík D.[1], Zátopková L.[1], Volt M.[2], Břízová P.[1], Pojar M.[2], Rejtar P.[3], Draganovičová J.[3], Hejna P.[1], Manďák J.[2]
[1]Ústav soudního lékařství LF UK a FN Hradec Králové
[2]Kardiochirurgická klinika LF UK a FN Hradec Králové
[3]Radiologicka klinika LF UK a FN Hradec Králové

Introduction: Multi-phase postmortem computed tomography angiography (MPMCTA) is the gold standard for whole-body postmortem angiography. We present the results of a study of 50 cases in which MPMCTA formed by three angiographic phases was applied. Material and Method: A total of 50 deceased were referred for a MPMCTA examination. . Both traumatic and natural deaths were included. Three types of contrast carrier were used – paraffin oil in 5 cases, polyethylene glycol in 23 cases, and isotonic solution in 22 cases. All liquid media were mixed with contrast agent Iomeron 400®. Results: After performing MPMCTA, the cause of death was clearly determined in 17 cases (34.0%) based on the radiological findings, and in two others (4.0%) a specific cause of death was suspected (1 case of subarachnoid hemorrhage from saccular aneurysm and 1 case of gastrointestinal bleeding) which was confirmed during autopsy. Of 17 cases of radiologically clearly determined cause of death, 12 were traumatic cases, 5 were sudden deaths. The cause of death was thus reliably determined based on MPMCTA in 70.6% of traumatic causes of death and in 15.2% of sudden deaths. Conclusions: MPMCTA is suggested method in all bodies without obvious postmortem changes regardless of the length of the PMI. The RAI has greater informative value for evaluating of postmortem changes. MPMCTA does not provide higher diagnostic yield for cause of death than unenhanced PMCT in traumatic cases. In sudden deaths, the most useful diagnostic value is when there is suspicion of bleeding in the gastrointestinal tract, vascular and parenchymal pathologies. Conventional autopsy is necessary after MPMCTA. Investigation protocol of MPMCTA could be modified according to specific conditions of department with the need to maintain three angiographic phases. PEG and isotonic solution are suitable contrast carriers. The isotonic solution modifies autopsy findings and histological examinations the least, and does not introduce artefacts. PEG produces the best imaging results due to its intravascular stability in cases with signs of autolysis; however, it is a more expensive alternative.

Postmortem CT angiografické vyšetření z pohledu perfuzionisty aneb jak to začalo...

Volt M., Pojar M.
Kardiochirurgická klinika FN Hradec Králové, Sokolská 581, 500 05 Hradec Králové

Post mortem CT angiografické vyšetření představuje v současné době ve forenzní medicíně vysoce specializovanou vědecko-výzkumnou metodu vyžadující multioborovou spolupráci. Autoři prezentují rozvoj post mortem CT angiografie ve FN Hradec Králové z pohledu perfuziologie, s důrazem na technické požadavky a specifika těchto vyšetření. Součástí prezentace je praktická ukázka perfúzního okruhu použitelného pro post mortem CT angiografii.

Prototype scanner Forescan® 3D dedicated to forensic practice.

Hamříková P., Čapek L., Vitvar J.
Centrum PATOS , Oddělení soudního lékařství a toxikologie, Liberec

The integration of 3D scanning technology in forensic pathology represents a significant advancement in the documentation and analysis of crime scenes and post-mortem examinations. Traditional 2D imaging methods often fail to capture the complexity of spatial relationships and details vital for thorough investigations and its presentation during court proceedings. As such, the use of dedicated 3D scanner, specifically designed for forensic applications, is essential to mitigate inaccuracies and open tools in forensic practice. Our newly developed prototype of 3D scanner offers superior accuracy and reliability in capturing intricate details during autopsy. It is dedicated specifically to forensic practice due to closed software circuit without need for open tools, proposes any place reproducibility and has easy to use facilities - users friendly manipulation. From the start we have aimed on metric precision. Inaccuracies in point cloud data recovery can lead to significant misinterpretations with adverse consequences especially in legal contexts. In similar way we approached the colour enhancement of reproducible images. A key part of our work was developing a custom calibration process to ensure reproducible results all the time — regardless of environmental factors or operator variability. So, as it goes the major outcome of our project is the autopsy image report — a detailed, high-resolution spatial dataset documenting the findings in both visual and numerical formats. In our talk we will discuss the advantages of employing high-resolution dedicated custom designed scanner Forescan® 3D over the use of commercially accessible well promoted devices which have gained popularity in various fields between professionals and laymen as well.

Keywords: forensic autopsy, 3D scanning, metric precision, colour enhancement

Session III.

Legal Aspects of the Relationship Between Medical and Forensic Autopsies in Czech Practice

Šolc M.
Katedra zdravotnického práva Právnické fakulty UK

In practice, situations arise in relation to medical and forensic autopsies in which physicians face legal uncertainty. The law provides that if, during an autopsy other than a forensic autopsy, suspicion arises that the death was caused by a criminal offence or that the circumstances of death are unclear, the autopsy must be interrupted and this fact must be reported to the Police without undue delay. During the performance of autopsies, however, the question often arises as to whether such suspicion is already sufficiently strong and well-founded to justify interrupting the autopsy. In other cases, the Police themselves request an opinion from a forensic pathologist on whether it is appropriate to order a forensic autopsy in the case. In yet other situations, there is from the outset a hypothetical possibility that the death may be connected to a potential criminal offence, but the likelihood is very low (for example, in cases of a general suspicion of incorrect professional procedure by a healthcare provider). In all these situations, the seemingly clear legal framework proves to be too vague, and the physician is compelled to make a decision for which there is no clear support. This talk focuses on defining at least basic criteria for decision-making in the situations outlined above.

Jak odčítat paušální hodnoty od výsledků dechové zkoušky. na alkohol.

Hirt M.[1], Vorel F.[2], Straka Ľ.[3], Vavera F.[4], Vojtíšek T.[5]
[1]Ustav soudního lékařství Fakultní nemocnice u sv. Anny v Brně a Lékařské fakulty Masarykovy univerzity; Katedra bezpečnostních studii, CEVRO univerzita; Katedra kriminalistiky, Fakulta bezpečnostně právní, Policejní akademie České republiky v Praze
[2]Soudnělekařske odděleni Nemocnice České Budějovice, a.s.
[3]Ústav súdneho lekárstva a med. expertiz, Jesseniova lekárska fakulta UK, Univerzitná nemocnica Martin
[4]Katedra trestního práva Fakulta právnická Západočeské univerzity v Plzni
[5]Ustav soudního lékařství Fakultní nemocnice u sv. Anny v Brně a Lékařské fakulty Masarykovy univerzity

Úvod: Ovlivnění alkoholem, a to nejenom u řidičů, je stále problém, který je třeba řešit. Cíle práce: Cílem prezentace je uvést na pravou míru postup praktikovaný v České republice při zjišťování okamžité koncentrace alkoholu v krvi pomocí dechových analyzátorů. Materiál a metodika: Jsou uvedeny dva příklady rozhodnutí sankčních orgánů týkající se řidičů, kteří řídili pod vlivem alkoholu. Podle dříve uplatňované praxe se od koncentrace alkoholu v krvi zjištěné dechovým analyzátorem jisté hodnoty odečítaly. Podle současných právních názorů by se to však dít nemělo. Výsledky a závěry: Pokud by se žádné hodnoty od výsledku dechové zkoušky neodečítaly, závěry, od kterých se odvíjí i výše trestu, by u popsaných případů s největší pravděpodobností byly zcela odlišné. Jenom na okraj zmiňujeme, že ve Slovenské republice je tento problém jednoznačně vyřešen už delší dobu přesně tak, jak se rýsuje i v ČR. Tedy že se od hladiny alkoholu v krvi zjištěné dechovou zkouškou, a tím spíše zjištěné plynovou chromatografií, žádná paušální hodnota neodečítá.

Poisoning Homicide - Historical Milestones, Methods, Key Figures

Straka Ľ.[1,2], Jurášeková P.[2], Janík M.[1,2], Rybárová V.[1,2], Sivulič R.[1,2], Martináková P.[1,2]
[1]Department of Forensic Medicine and Medical Expertises JFM CU a UH, Martin
[2]Department of Forensic Medicine and Pathology HCSA, Martin

Poisoning homicide represents one of the oldest and most concealed forms of violent death, characterized by low visibility, delayed manifestation of symptoms, and frequent misinterpretation as natural disease. This presentation traces the historical development of poisoning as a method of homicide from prehistory to the modern era, emphasizing its evolving medical, forensic, and legal implications. Early use of natural toxins in hunting and warfare gradually expanded into intentional poisoning in antiquity, where substances such as hemlock, aconite, opium, and arsenic were employed for assassination, execution, and suicide. Ancient scholars, including Hippocrates, Galen, and Avicenna, contributed to early distinctions between therapeutic and toxic doses. During the Renaissance, limited diagnostic tools and restricted autopsies hindered reliable identification of poisoning, fostering a “golden age” of undetected toxic crimes. The emergence of experimental toxicology, initiated by Paracelsus and later advanced by Orfila, marked a turning point through systematic chemical analysis and dose–response principles. The development of arsenic detection methods, notably the Marsh test, established chemical proof as decisive forensic evidence, exemplified by the Lafarge affair. Modern forensic toxicology integrates spectroscopy, immunochemical assays, and chromatographic techniques, with LC-MS/MS representing the current gold standard. These methods enable sensitive and specific detection of chemical, biological, and physical toxic agents. The presentation also reviews prominent contemporary poisoning cases involving ricin, dioxins, polonium-210, and nerve agents like epibatidine. In the present era, poisoning cases remain diagnostically challenging due to non-specific clinical and autopsy findings. Accurate determination of cause and manner of death requires close interdisciplinary cooperation between forensic medicine and toxicology, emphasizing pathophysiological correlation and legally defensible interpretation.

Session IV.

Reconstructive aspects in the investigation of fire deaths

Bohnert M.
Institute of Forensic Medicine, University of Würzburg

In forensic examinations of fire-related deaths, the primary focus is on determining the cause of death and the vitality of the findings. Questions regarding the dynamics of the fire, its duration, or the victim's posture during the fire are, by comparison, rarely addressed. One reason for this may be the extensive post-mortem destruction of the body in some cases; however, another reason may be that the possibilities for reconstruction in cases of fire-related deaths are underestimated. In fact, in many cases, conclusions about the course of the fire can be drawn from the severity and anatomical distribution of the burns. The lecture aims to raise awareness of this aspect and highlight typical scenarios.

Session V.

Forensic Value of Internal Injuries in Hanging: Results of a 10-Year Prospective Study and New Insights

Kuruc R.[1,2], Neszméry M.[2] , Nižnanský Ľ.[1,2] , Šikuta J.[1,2], Mikulášová D.[1] , Szórádová A.[1,2]
[1]Institute of Legal Medicine and Medico-Legal Toxicology, Faculty of Medicine, Comenius University, Sasinkova 4, 81108 Bratislava
[2]Department of Forensic Medicine, Health Care Surveillance Authority, Antolská 11, 85107 Bratislava

Background: Hanging is the most common method of suicide in many countries. It is characterized by high lethality, technical simplicity, and the presence of several typical autopsy findings. While external injuries tend to be relatively consistent, internal findings show considerable variability in literature, and their forensic value—particularly with regard to vitality—remains a subject of debate. The aim of this study is to present the results of a 10-year prospective analysis of 660 cases of hanging and to supplement them with new observations. Methods: The study was conducted at the Forensic Medicine Department of the Health Care Surveillance Authority in Bratislava between 2015 and 2024. All cases underwent a standardized complete autopsy including histological and toxicological examinations and analysis of the circumstances of death. Following a publication in 2024 drawing attention to periadventitial aortic hemorrhages in hanging, this finding was subsequently examined in a targeted manner. Results: Argent's line was present in 61.1% of cases, hemorrhages in the neck muscles in 53.8%, fractures of the laryngo-hyoid complex in 49.7%, and Simon's hemorrhages in 35.2%. Amussat's sign was identified in 10.2% and the Etienne Martin sign in 1.1% of cases. Cervical spine injuries occurred in 2.6%. Intestinal wall hemorrhage was present in 7.4% and rectal hemorrhage in 1.1% of cases. In 2025, periadventitial aortic hemorrhages were identified in 7.5% of hanging cases, in contrast to their absence in the initial cohort of 30 cases examined in 2024. Conclusions: The findings confirm the forensic relevance of several internal findings in hanging, particularly in the context of vitality and the mechanism of death. New observations of periadventitial aortic hemorrhages suggest that this finding may be more common than previously assumed. Tympanic membrane changes and facies sympathique represent additional potential vital signs that warrant systematic evaluation in future studies. These results support the need for further research and standardization in the assessment of internal findings in hanging.

Suicide notes and suicide methods: quantitative associations between note structure and method profiles

Šafr M., Lochmannová A.
Department of Forensic Medicine, Faculty of Medicine in Hradec Králové and Department of Forensic Medicine, University Hospital Hradec Králové

Background: Quantitative evidence linking suicide note characteristics to suicide method remains limited. Aim: To describe content and format patterns in suicide notes and to test whether note features, sex, and age predict

method choice and a soft versus hard method taxonomy. Material and Methods: We analysed 164 suicide notes, 129 men and 35 women. Forty variables covering demographics, suicide method, and note features were coded and screened in 780 pairwise comparisons using Fisher's exact test, with effect size interpreted by Cramér's V. For soft versus hard method, we used repeated random 80/20 train–test splits, 10 simulations, and fitted a logistic model. Results: Note length showed consistent associations with interpersonal structuring. Addressee salutation, Cramér's V 0.51, praises, 0.51, and listing of survivors, 0.48, were more frequent in longer notes. Practical notes most often contained tasks to survivors, V 0.42, while criticism clustered in negative notes, V 0.44. Animal care was rare, 10 of 164, and occurred only when at least one person was named, V 0.42. Method patterns differed by sex, with hanging predominant among men, 65.1%, and intoxication and jumping more common among women, 28.6% and 14.3%. Across simulations, prediction accuracy for soft versus hard ranged from 81.3% to 90.6%. In the final model, male sex and medium note length increased the odds of hard methods, while higher age reduced them. Long and very long notes shifted odds toward soft methods. Conclusion: Suicide notes show measurable, non-random structuring that aligns with both interpersonal focus and suicide method profiles. Note-based coding combined with effect-size screening and predictive modelling can inform forensic interpretation and targeted prevention.

Novel aortic lesions in hanging deaths: preliminary data

Kovařík D.[1], Pohlová Kučerová Š.[2], Sivulič R.[2], Zátopková L.[1], Janík M.[2], Straka Ľ.[2], Hejna P.[1]
[1]Department of Forensic Medicine, Faculty of Medicine in Hradec Kralove, Charles University, Šimkova 870, 500 03, Hradec Kralove; Department of Forensic Medicine, University Hospital Hradec Kralove, Sokolska 581, 500 05 Hradec Kralove
[2]Institute of Legal Medicine and Medico-legal Expertise, Jessenius Faculty of Medicine, Comenius University, Martin

Background: Hanging is a form of strangulation and is the dominant method in male suicide in the Czech Republic. Ruling out a homicidal manner of death poses crucial moment in the investigation of every strangulation case. There are established autopsy findings originating from partial or total body suspension, such as carotid lesions, hemorrhages at the origin of sternocleidomastoid muscles and Simon sign. In addition to these, the forensic literature has recently described so-called "novel aortic lesions", the incidence and etiopathogenesis of which are unknown. Aim: This presentation closely shows the prospective study aimed on the observation of novel aortic lesions. The study focuses on the incidence and diagnostic value of these lesions in hanging deaths. Material and Methods: The presentation is based on a group of hanged individuals and control group encountering natural and unnatural deaths, both with randomly chosen 30 cadavers. In every case, an in situ dissection of the aorta was performed, including a thorough evaluation of the adventitia, with consequent opening of the aorta with revision of the intima. Any suspected findings were sampled for histology and photographed for a second evaluation. Results: The hanged group consisted of 26 males and four females (86.6%/13.4%); the mean age was 56.6 years. The control group consisted of 24 males and six females (80%/20%); the mean age was 60.6 years. Intimal breaching of the aorta was observed in three cases (10%) in the hanged group, resp. in one case (3%) in the control group. In the hanged group, subintimal hemorrhages were detected in seven cases (23.3%), but none were detected in the control group. Adventitial hemorrhages were frequent in both groups (21 cases/70% in the hanged group; 20 cases/66.6% in the control group). Additionally, three cases (10%) of specific petechial hemorrhages were detected in the control group. Conclusion: The presentation shows a similarly high incidence of aortic adventitial hemorrhages in both groups. In addition to body suspension, this change could also be caused by other variables, such as cardiopulmonary resuscitation, hypostasis, prolonged asphyxia or positive toxicology. Intimal lesions are generally much less frequent and are predominantly observed in the group of hanged individuals. They could potentially serve as an indicator of body suspension.

Homicide–Suicide in the Eastern Part of the Czech Republic: A Retrospective Regional Study (1998–2023)

Svrchokryl V.
Ústav soudního lékařství a medicínského práva Fakultní nemocnice Olomouc a Lékařská fakulta Univerzity Palackého v Olomouci, Olomouc

Background and Objective: Homicide followed by suicide (H–S) represents a distinct form of fatal violence. This retrospective study analyzed 39 H–S incidents (108 decedents in total) in the eastern part of the Czech Republic. Methods: Data were extracted from autopsy reports covering the period 1998–2023. Cases were classified according to internationally used methodology. Demographic characteristics, lethal mechanisms, toxicology findings, and offender motivations were assessed. Results: The incidence of H–S in the studied region was rare, similarly to reports from other countries. The most frequent type was intimate partner H–S (46.2%), followed by familial (33.3%) and non-familial (20.5%) events. Offenders were predominantly male (92.3%). Firearm injuries were the leading lethal mechanism. Ethanol was detected in approximately one third of cases, particularly in association with intimate partner conflicts. Jealousy and revenge were the predominant motives in intimate partner and non-familial incidents, whereas pseudoaltruism prevailed in familial tragedies. Non-familial events showed features consistent with "pseudocommando" offenders. Conclusion: The findings are consistent with international studies. H–S is a rare event with a substantial societal impact. More in-depth analyses may contribute to the development of appropriate preventive measures.

Head-on Collision as the Final Phase of a Homicide–Suicide Event: A Forensic Reconstruction of a Case

Bízik J., Štuller F., Straka Ľ.
[1]Forensic and Pathological-Anatomical Unit, Health Care Surveillance Authority, Martin
[2]Department of Forensic Medicine and Medical Expertise, Jessenius Faculty of Medicine, Comenius University Bratislava, Martin

Homicide–suicide (HS) is a multifactorial and polymorphic phenomenon defined by the killing of one or more individuals followed by the perpetrator's suicide. Although relatively rare, HS represents a significant diagnostic challenge in forensic practice, particularly when the violent act is concealed as an accident. The key forensic issue in such cases is the assessment of injury vitality, i.e., the differentiation between vital and postmortem lesions. This case report concerns a married couple initially classified as victims of a fatal head-on collision between a passenger vehicle and a truck. The preliminary conclusion attributed both deaths to traumatic–hemorrhagic shock due to a traffic accident. Subsequent investigative findings revealed inconsistencies, including bloodstains and a ligature in the couple's bedroom, suspicious GPS records of the vehicle's trajectory, deactivation of the vehicle's lights shortly before impact, and discrepancies between CCTV footage and the reported seating positions. Autopsy findings demonstrated substantial differences in injury patterns. The male decedent exhibited polytrauma fully consistent with a head-on collision, including upper limb fractures typical of a driver. In contrast, the female decedent presented two distinct groups of injuries. The first consisted of unequivocally vital lesions indicating assault and ligature strangulation, including a ligature mark, defensive injuries, fingernail abrasions, and internal cervical hemorrhages. The second group comprised postmortem injuries sustained during the collision. Evaluation of tissue reactions and hemorrhagic patterns supported the conclusion of a preceding violent attack. Integrated analysis of autopsy and investigative findings led to the classification of the case as HS. The reconstructed sequence involved a physical (manual) assault followed by fatal ligature strangulation of the wife, and subsequently an intentionally initiated head-on collision as a suicidal act. The case underscores the critical importance of injury vitality assessment and interdisciplinary cooperation in forensic reconstruction, as differentiation between vital and postmortem lesions may fundamentally alter the legal interpretation of the event.

Fatal Injuries in Scooter Accidents – A Forensic Analysis of Three Cases

Mikulášová D.[1,2], Neszméry M.[2], Kuruc R.[1,2], Šikuta J.[1,2], Szórádová A.[1,2]
[1]Institute of Legal Medicine and Medico-Legal Toxicology, Faculty of Medicine, Comenius University, Sasinkova 4, 81108 Bratislava
[2]Department of Forensic Medicine, Health Care Surveillance Authority, Antolská 11, 85107 Bratislava

Background: The rapid growth of individual micromobility, particularly the use of electric and motorized scooters, has been accompanied by an increasing number of accidents resulting in severe and fatal injuries, especially in urban environments. Although scooters are often perceived as low-risk vehicles, forensic practice is increasingly confronted with fatal cases presenting specific diagnostic and interpretative challenges. Aim: The aim of this presentation is to analyze the characteristics, mechanisms, and forensic significance of fatal injuries sustained in scooter accidents based on three case studies. Material and Methods: Three fatal cases associated with electric or motorized scooter accidents examined at a forensic medical department in Bratislava were retrospectively analyzed. The evaluation focused on the circumstances of the accident, macroscopic autopsy findings identified during external and internal examinations, injury mechanisms, toxicological results, determination of the cause of death, and assessment of the accident scene. Results: All cases involved severe high-energy blunt force trauma, predominantly craniocerebral and cervical spine injuries, leading directly to death. Typical injury patterns corresponding to falls or collisions were identified. Toxicological analyses revealed the presence of alcohol or psychoactive substances, which may have contributed to the occurrence of accidents. Conclusion: Scooter-related accidents can result in severe, life-threatening injuries with fatal outcomes and represent a growing challenge for forensic practice. Comprehensive forensic assessment, including thorough injury documentation, toxicological analysis, and interdisciplinary cooperation, is essential for accurate postmortem evaluation and for monitoring emerging micromobility-related injury trends.

Impact Direction and Injury Severity in a Train-to-Train Collision: A Forensic Case Series of 75 Survivors

Štuller F.[1], Bízik J.[1], Rybárová V.[1,2], Sivulič R.[1,2], Straka Ľ.[1,2], Kolla E.[3]
[1]Department of Forensic Medicine and Pathological Anatomy, Healthcare Surveillance Authority, Martin
[2]Department of Forensic Medicine and Medicolegal Expertise, Jessenius Faculty of Medicine, Comenius University, University Hospital, Martin
[3]Research Section, Institute of Forensic Engineering, University of Žilina, Žilina

Background: Mass railway collisions are rarely analyzed in detail from a forensic perspective. Understanding the relationship between passenger position, impact direction, and injury severity is essential for medicolegal evaluation and biomechanical interpretation. Methods: We evaluated 75 injured passengers involved in a head-on railway collision that occurred on 22 June 2022 on the Žilina–Vrútky railway line in the Slovak Republic. For each individual, we assessed the position inside the train (sitting or standing; facing or opposite to the direction of travel), the presence of nearby persons at the moment of deceleration, and the presence of loose objects potentially contributing to the injury mechanism. Each case included a review of personal testimony, medical documentation, assessment of injury consequences, and standardized pain compensation scoring. Results: Injury severity correlated with passenger orientation. Individuals seated with their backs facing the direction of travel sustained less severe injuries, whereas passengers seated or standing facing the direction of movement exhibited more extensive trauma. The most severe injuries were sustained by the locomotive driver, who suffered major head trauma caused by a detached airborne metal component from the locomotive interior. Conclusions: Passenger orientation and interior dynamics significantly influenced injury patterns. The findings are consistent with established biomechanical principles of deceleration trauma and provide relevant insights for forensic reconstruction and transport safety evaluation.

Session VI.

Náhla srdcová smrť a možnosti post-mortem genetického vyšetrenia na Slovensku

Grünnerová L.[1], Petrovič R.[1], Vojvodová M.[2], Konečný M.[3], Krebsová A.[4], Illíková V.[5]
[1]Ústav lekárskej biológie, genetiky a klinickej genetiky LFUK a UNB, Bratislava
[2]Ambulancia lekárskej genetiky, AGEL s.r.o.
[3]Laboratórium genomickej medicíny, AGEL Gen, s.r.o., Vedecký park UK, Bratislava
[4]Centrum dědičných kardiovaskulárních onemocnění, Klinika kardiologie, Institut klinické a experimentální medicíny, Praha, Česká republika, ERN GUARD Heart
[5]Detské kardiocentrum, NÚSCH, a.s., Bratislava

Post-mortem genetické vyšetrenie prípadov náhlych kardiálnych úmrtí je dnes neoddeliteľnou súčasťou kardiogenetiky, napriek tomu však na území Slovenskej republiky nebolo rutinne dostupné do roku 2025. Vďaka nadviazaniu spolupráce s odborníkmi na náhlu srdcovú smrť v Českej republike, v súčasnosti zavádzame aj na území Slovenska pilotný projekt post-mortem genetického testovania prípadov náhlej srdcovej smrti v súlade s odporúčaniami Európskej kardiologickej spoločnosti (ESC), Európskej resuscitačnej rady (ERC) a Európskej spoločnosti pre kardiovaskulárne patológie (AECP). Naďalej pracujeme na vytvorení multidisciplinárnej a multicentrickej spolupráce odborníkov z oblasti súdneho lekárstva, genetiky a kardiológie, ktorá je nevyhnutným predpokladom fungovania celého projektu. Cieľom tejto prednášky je predstavenie projektu, jeho centrálnej koordinácie, poskytnutie informácií ohľadom praktického postupu pre súdnych lekárov a tiež informácií pre príbuzných obetí (www.nahleumrtie.sk). V rámci príspevku ďalej prezentujeme kazuistiku vzácneho autozómovo recesívneho ochorenia, syndrómu arteriálnej tortuozity na podklade homozygotného pravdepodobne patogénneho DNA variantu c.707T>C p.(Leu236Pro) génu SLC2A10, ktorý bol zistený u dvoch súrodencov s potvrdenou konsangvinitou v rodine. Tento syndróm patrí medzi zriedkavé monogénové príčiny dedičných aortálnych ochorení, je charakteristický prítomnosťou špecifickej tvárovej dysmorfie, pľúcnej hypertenzie, blefarofimózy, pričom aortopatia predstavuje jeden z možných aj keď nie dominujúcich klinických prejavov ochorenia.

Autopsy Guidelines for Aortic Dissection: Review of the Literature

Pohlová Kučerová Š.[1], Zátopková l.[1], Hlaváčková A-M.[1], Krebsová A.[2]
[1]Ustav soudniho lekařstvi LF UK a FN Hradec Kralove
[2]Klinika Kardiologie, Centrum dědičných kardiovaskulárních onemocněni Institut klinické a experimentální medicíny

Background: Guidelines for sudden cardiac death are well defined in forensic medicine and are generally applied in autopsy practice, especially in cases of sudden death in persons under 40 years of age. Standardized autopsy procedures, including the scope of complementary examinations, are not clearly described for acute aortic syndromes. In particular, cases of aortic dissection in individuals under 60 years of age should be further investigated due to the possibility of hereditary disease and the risk of sudden death for relatives. Aim: This communication aims to present international best practices for autopsies of acute aortic syndromes, with a particular focus on aortic dissection, based on an analysis of recent literature. Material and Methods: Recent guidelines for sudden cardiac death were analyzed. Recommendations for acute aortic syndromes were selected and summarized. Results: Guidelines for autopsy in sudden cardiac death do not describe the exact procedure for autopsy of the aorta in acute aortic syndromes. It is usually only recommended to perform autopsy of the aorta in conjunction with the heart. Outside the circumference of the aortic valve, it is not usually recommended to measure the circumference of the ascending and descending thoracic aorta. The range of complementary and follow-up examinations (histology, genetic analysis, preventive cardiological examinations of relatives) is not clearly defined. Conclusion: International guidelines are very well applicable in autopsy practice in the Czech Republic in cases of sudden cardiac death due to myocardial pathologies. Increasing frequency of clinical preventive examinations of families of deceased persons for aortic dissection should lead

to the creation of national recommendations for autopsies of acute aortic syndromes. The aim is to prevent sudden death effectively.

Fatal non-traumatic aortic pathologies: 5-years retrospective study

Hlaváčková A-M., Pohlová Kučerová Š., Zátopková L., Kovařík D., Ublová M., Šafr M. Hejna P.
Department of Forensic Medicine, University Hospital Hradec Králové, Sokolská 581, 500 05 Hradec Králové

Background: Fatal non-traumatic aortic pathologies are indispensable component of forensic medical practice. These pathologies consist of acute aortic syndromes and chronic aortic diseases. Acute aortic syndromes are a heterogeneous group of conditions that may have an underlying hereditary basis. Aim: The aim of this presentation is a 5-year retrospective analysis of fatal non-traumatic aortic pathologies that underwent autopsy at the Institute of Forensic Medicine in Hradec Králové. Material and Methods: Cases of acute aortic syndromes and chronic aortic diseases were excerpted from a total of 4489 autopsies from five years (2021-2025). A detailed retrospective analysis of acute aortic syndromes was performed, focusing on age, gender, type of aortic pathology, indication of genetic analysis, and results of genetic analysis. Results: Acute aortic syndromes were identified in 126 cases; chronic aortic diseases were recorded in 70 cases. The average age (70,4 years) was the lowest in subgroup of aortic dissections. Aortic dissections were recorded in 70 cases. 15 cases of acute aortic syndromes were consulted with a geneticist and cardiologist to consider genetic testing. A positive detection of a pathological mutation was found in 2 cases. Conclusion: According to current AECVP guidelines, genetic analysis should be considered for acute aortic syndromes; however, this test cannot be performed in all cases. In forensic practice, the most significant limitations are the lack of active engagement from the deceased's family members regarding the post-mortem findings, the unclear age limit for genetic analysis of the deceased, and the absence of a precise list of aortic syndromes to be indicated for genetic analysis.

Akutní disekce aorty, její dědičné příčiny a možnosti prevence; přesah pitevních nálezů do klinické péče o pozůstalé v riziku

Krebsová A.[1], Votýpka P. [2], Tománková S.[1], Peldová P. [2], Gardáš D.[1], Adamová M.[1], Szarszoi O.[1], Pirk J.[1], Macek M.[2], Kautzner J.[1]
[1]Centrum dědičných kardiovasculárních onemocnění, Klinika Kardiologie, IKEM, Praha,
[2]Ústav bologie a lékařské genetiky, 2. lékařská fakulta, Univerzita Karlova a Fakultní nemocnice Motol, Praha

Úvod a Cíle: Akutní disekce aorty u jedinců mladších 60 let může představovat život ohrožující komplikaci dědičného onemocnění. Cílem naší studie bylo stanovit dědičné příčiny onemocnění aorty u pacientů/zemřelých a stanovit možnosti prevence u příbuzných v riziku, kdy přesná doporučení existují jen u geneticky určených dědičných příčin.

Pacienti a metody: V letech 2014–2025 jsme identifikovali 648 dospělých pacientů (450 mužů / 198 žen, průměrný věk při diagnóze 50/53 let) s potenciálně dědičným AOS. Soubor zahrnoval 130/648 případů s akutní disekcí (přeživších nebo post mortem). Všichni probandi/příbuzní podstoupili klinicko genetickou konzultaci a molekulárně genetickou analýzu s využitím sekvenování nové generace (cílené/exomové sekvenování; SOPHiA GENETICS, Švýcarsko). Rodinný kaskádový screening byl proveden u 717 příbuzných (1,1 na případ).

Výsledky: Varianty třídy 4 a 5 v asociovaných genech byly zjištěny u 52 (8 %) všech případů (14 % u disekcí). Identifikované geny nesoucí patogenní varianty DNA vedly k diagnóze Marfanova a Loeys Dietzova syndromu, spolu s vaskulárním Ehlers Danlosovým syndromem (EDS IV) vyskytujícím se především u zemřelých. Rodinný kaskádový screening identifikoval dalších 32/717 jedinců s molekulárním rizikem, zatímco kardiologický screening prokázal aortopatii u 270/717.

Závěr: Genetický výtěžek u potenciálně dědičného onemocnění aorty je nízký. Naopak díky kardiologickému screeningovému vyšetření lze identifikovat až 38 % rizikových příbuzných. Bez genetického nálezu jsme často odkázáni na posuzování rizika disekce na základě věku při disekci, jejích okolností ve smyslu míry korekce

arteriální hypertenze, ale i udaných rozměrů aorty v momentě disekce. Proto usilujeme o sjednocení anatomických měření u žijících a zemřelých, které by dále přispělo ke zlepšení péče a prevenci náhlé smrti v důsledku akutní disekce prvostupňových příbuzných.

Granty: Ministerstvo zdravotnictví České republiky, grant č. NW25J_02_00024

Detection of myocardial apoptosis using the TUNEL assay in sudden deaths with emphasis on arrhythmogenic ventricular cardiomyopathy

Farkaš D.[1], Tóth Š.[2], Ginelliová A.[1], Maretta M.[3], Vasovčák P.[4], Farkašová Iannaccone S.[5]
[1] Medicolegal Department of Health Care Surveillance Authority, Ipeľská 1, 043 74 Košice
[2] Department of Histology and Emryology, Faculty of Medicine, Pavol Jozef Šafárik University, Šrobárova 2, 041 80, Košice
[3] Department of Neurology, Faculty of Medicine, Pavol Jozef Šafárik University, Trieda SNP 1, 041 11 Košice
[4] Laboratory of Molecular Biology, Agel Novy Jičin, a.s., Revoluční 2214/35, 741 01 Nový Jičin
[5] Department of Forensic Medicine, Faculty of Medicine, Pavol Jozef Šafárik University, Trieda SNP 1, 041 11 Košice

Background: Macroscopic and microscopic detection of arrhythmogenic ventricular cardiomyopathy is challenging due to the number and variability of findings that can mimic this condition, or can be observed in other myocardial diseases.

Aim: In this paper we will discuss the TUNEL assay as a method for detecting apoptotic cells in sudden unexpected deaths following cardiac damage.

Material and Methods: A retrospective analysis of two groups of sudden deaths was performed. The first group comprised of 8 cases of fatal sudden unexpected death where arrhythmogenic ventricular cardiomyopathy was suspected. The second group comprised of control subjects with known cause of death. The right ventricular wall from both groups was examined using the TUNEL assay. The TUNEL assay (Terminal deoxynucleotidyl transferase dUTP Nick End Labeling) is a widely used technique in the field of molecular biology and programmed cell death (apoptosis) research. This technique enables to visualize cells undergoing cell death. The presence of apoptotic myocardial and interstitial cells of the right ventricular myocardium were determined histologically using the TUNEL (*PROMEGA DeadEnd™ Fluorometric TUNEL System*) assay. The total number of TUNEL-positive cardiomyocytes was calculated as the number of positive cells *per* mm^2 of myocardial tissue in 10 random fields from both groups. Quantitative histological analysis was assessed using Tukey-Kramer multiple comparison post-hoc analysis method. The results were expressed as mean (M) ± standard error of the mean (SEM). P values less than 0.05 were considered to be significant.

Results: A significantly higher number of apoptotic TUNEL-positive myocardial cells ($p<0.001$) were identified in the first group with suspected arrhythmogenic ventricular cardiomyopathy (383.66 ± 25.23) compared with the control group (167.23 ± 19.09). Similarly, a significantly ($p<0.001$) higher number of TUNEL-positive interstitial cells were detected in the group with suspected arrhythmogenic cardiomyopathy (258.74 ± 14.23) compared with the control group (97.29 ± 14.87).

Conclusion: The number of cardiomyocytes and interstitial cells undergoing apoptosis were significantly higher in cases of primary cardiac damage in arrhythmogenic ventricular cardiomyopathy compared to the control subjects.

Nečekané fatální krvácení u Marfanova syndromu

Makuša M.
Soudnělékařské oddělení Nemocnice České Budějovice, a. s.

Marfanův syndrom je hereditární systémová nemoc pojiva s incidencí 1 k 5000 bez výraznější preference pohlaví či rasy. Onemocnění provází typický fenotyp, tedy vysoký štíhlý vzrůst s výrazně delšími končetinami s tzv. pavoučími prsty, závažnými a život ohrožujícími jsou však projevy orgánové, zejména v rámci kardiovaskulárního systému. V popisovaném případu pacientky s Marfanovým syndromem, umírající v důsledku fatálního krvácení, budou diskutovány její projevy této nemoci, provedené terapeutické zákroky a jejich následný vývoj.

Session VII.

Analytical Methods in Doping Control

Nováková L.[1], Nicoli R.[2], Veuthey J-L.[3], Guillarme D.[3]
[1]Department of Analytical Chemistry, Faculty of Pharmacy in Hradec Králové, Charles University, Czech Republic
[2]Swiss Laboratory for Doping Analysis, Centre universitaire romand de médecine légale, Switzerland
[3]School of Pharmaceutical Sciences, University of Geneva, Switzerland

Background: Doping control represents a highly specialized branch of forensic and analytical toxicology, requiring the reliable detection of a wide spectrum of structurally diverse prohibited substances in complex biological matrices. Analytical strategies are strictly regulated by the World Anti-Doping Agency (WADA), including performance requirements such as minimum required performance levels (MRPLs), placing high demands on sensitivity, selectivity, and robustness of the employed methods.

Aim: The aim of our study was to improve current analytical approaches used in doping control in order to enlarge the analytical toolbox in the doping control. The emphasis was put on separation chromatographic methods, both ultra-high-performance liquid chromatography (UHPLC) and supercritical fluid chromatography (SFC) hyphenated with mass spectrometry (MS).

Material and Methods: Advanced analytical workflows based on UHPLC and SFC coupled to MS were evaluated. Both triple quadrupole (MS/MS) and high-resolution mass spectrometry (HRMS) systems were evaluated in targeted analysis approach. The study included selected classes of prohibited substances differing in polarity and structural complexity (e.g., stimulants, narcotics, anabolic agents, glucocorticoids, and hormones). Different sample preparation strategies, including dilute-and-shoot and supported liquid extraction, were applied depending on analyte properties and required sensitivity. Additionally, the impact of ion mobility separation on analytical performance was assessed.

Results: The comparison of UHPLC-MS/MS and UHPSFC-MSMS approaches revealed complementary selectivity and retention behavior for different classes of analytes. Method performance, including sensitivity, matrix effects, and compliance with MRPL requirements, varied across compound classes. Overall, both methods proved to be capable of analyzing hundreds of compounds in one run in short analysis times up to 10 minutes meeting rigorous requirements of MRPL. This enables the complementarity of the two approaches in screening analyses.

The use of HRMS and ion mobility added an additional separation dimension, allowing differentiation of structurally related and isomeric compounds and reducing matrix interferences. However, correct setting of processing method was very challenging in order to prevent false positive identifications.

Conclusion: Complementary use of chromatographic techniques and MS approaches, including UHPLC, UHPSFC, MS/MS, HRMS, and ion mobility, provides a comprehensive and reliable analytical strategy in doping control. Such integrated approaches are essential to ensure high confidence in results and to meet the stringent requirements.

Session VIII.

Time of death determination by analysis of glyceraldehyde 3-phosphate dehydrogenase degradation

Sivulič R., Samec M., Samec I., Straka Ľ., Janík M.
Ústav súdneho lekárstva a medicínskych expertíz JLF UK a UNM, Martin

Introduction: Accurate estimation of the postmortem interval (PMI) is a key objective in forensic practice, aiding reconstruction of events and investigative evaluation. Conventional methods rely on thanatological changes such as algor, livor, and rigor mortis, as well as decomposition patterns and, in later stages, forensic entomology or biochemical analyses. However, these approaches are strongly influenced by environmental and individual factors. Consequently, there is increasing interest in objective molecular techniques that may provide more precise and reproducible PMI estimation. Materials and methods: To evaluate GAPDH mRNA degradation, we employed droplet digital PCR (ddPCR) using a custom in-house–designed assay specifically targeting GAPDH in the analyzed biological samples. The assay was further optimized in our laboratory with respect to primer/probe concentrations and annealing temperature gradients, and subsequently validated and applied to forensic samples. Results: The results will be presented at the 10th Czech-Slovak congress of Forensic Medicine. Conclusion: The investigated molecular approach represents a promising tool for improving the accuracy and objectivity of postmortem interval estimation. By targeting measurable postmortem biochemical changes, it may reduce the influence of environmental and individual variability associated with conventional methods. Further validation on larger sample sets and under varying conditions is necessary to determine its practical applicability in routine forensic casework.

Anaphylaxis as a cause of sudden and unexpected death

Vácha A., Krajsa J., Mičánková L., Hliboká M., Kalinka Grusová T., Vojtíšek T.
Department of Forensic Medicine, St. Anne‘s Faculty Hospital, Masaryk University, Brno

Background: The prevalence of anaphylactic reactions in Europe is 0.3%. Some studies suggest that unrecognized anaphylaxis may be the cause of death in up to 13% of sudden and unexpected deaths. Fatal reactions occur in sensitized individuals upon repeated contact with the antigen. The most common triggers in Europe are food, drugs, insect venom, and latex. After the allergen enters the body, it binds to IgE antibodies on the membranes of mast cells and basophils, leading to their degranulation and the development of anaphylaxis. After an insect sting, an anaphylactic reaction occurs on average after 20 to 40 minutes. Serum tryptase and specific IgE levels are determined. Aim: The effect of the post-mortem interval on serum tryptase levels is unclear; there are studies with conflicting results, but it should not be significantly affected in the first two days after death. The autopsy may reveal a sting, but the findings of the internal examination are nonspecific – congestion and edema of the lungs, edema of the upper respiratory tract and brain, abundant mucus in the bronchi, and petechial hemorrhage. If death occurs without witnesses or if there are traumatic changes on the body, the possibility of an allergic reaction can easily be overlooked in the differential diagnosis. In addition, serum tryptase levels may also be elevated in cases of more extensive trauma. The presentation is a prospective study focusing on the determination of serum tryptase levels in sudden and unexpected deaths. Material and methods: In 2024, a grant project was carried out at St. Anne's University Hospital in cooperation with ÚSL, ÚKIA, and CKTCH, in which serum tryptase levels were determined in indicated cases (sudden and unexpected deaths). In all deceased persons, blood was taken from the femoral vein in a sterile manner prior to autopsy. If the autopsy revealed a clear immediate cause of death, the sample was discarded. Otherwise, the sample was sent for serum tryptase level testing. Results: Of the total number of 57 deaths, elevated serum tryptase levels were found in nine cases. Of these, elevated IgE levels were found in three cases. Of these three cases, specific IgE could not be detected in one case, while specific IgE against insect venom was detected in the other two cases. Anaphylaxis was determined to be the immediate cause of death in these cases. Conclusion: Even though anamnestic information is lacking in some cases of sudden and unexpected death, anaphylaxis should always be included in the differential diagnosis.

Možnosti imunohistochemické detekce ischemie myokardu v časném postmortálním intervalu

Čegan M.
Patologické odělení Masarykovy nemocnice v Ústí nad Labem

Současné možnosti imunohistochemie v diagnostice náhlé smrti z kardiálních příčin. Návrh mezioborové spolupráce mezi patologií a soudním lékařstvím.

Imunohistochemický průkaz CD68-pozitivních makrofágů v plicích při protrahované hypoxii

Toupalík P., Šimková J., Karásková L., Koubová M.
Všeobecná fakultní nemocnice Praha

Makrofágy představují klíčovou složku vrozené imunity a hrají zásadní roli v udržování homeostázy plicní tkáně. V situacích nedostatku kyslíku dochází k jejich aktivaci, změně fenotypu a zvýšené expresi povrchových markerů, mezi nimiž se za standardní považuje CD68. V pilotní studii autoři sdělují své zkušenosti s imunohistochemickým průkazem CD68-pozitivních makrofágů v plicích nejen u různých typů hypoxie, ale též při chronické srdeční insuficienci.

Subendokardiálne krvácania v súdnolekárskej praxi – mechanizmus vzniku, vplyv KPR a potreba štandardizovaného hodnotenia

Martináková P.[1,2], Janík M.[1,2], Straka Ľ.[1,2]
[1]Department of Forensic Medicine and Medicolegal Expertise, Jessenius Faculty of Medicine, Comenius University, University Hospital, Kollárova 10, 036 01, Martin
[2]Forensic and Pathological-Anatomical Unit, Health Care Surveillance Authority, Kuzmányho 27/B, 036 01, Martin

Background: Subendocardial haemorrhages represent a frequent autopsy finding in forensic practice. Although traditionally associated with acute ischemic myocardial injury, they are also observed in non-cardiac causes of death. Their diagnostic interpretation remains challenging due to their non-specific nature and the variability of underlying mechanisms. Aim: The aim is to provide an overview of current knowledge on the morphology and pathophysiological mechanisms of subendocardial haemorrhages, to evaluate the impact of cardiopulmonary resuscitation on their development, and to emphasize the importance of standardized and quantitative cardiac assessment in autopsy practice. Material and Methods: The presentation is based on a structured review of published literature, combined with practical experience from routine medico-legal autopsies within an ongoing prospective study of reactive cardiac changes. A standardized approach to cardiac morphometry is outlined, including precise measurement of heart weight, cavity dimensions and myocardial wall thickness using digital calipers. Results: The literature describes multiple mechanisms underlying subendocardial haemorrhages. In craniotrauma, a neurogenic mechanism is presumed. In hypoxia, asphyxia and shock, vulnerability of the inner myocardial layer is attributed to impaired perfusion. CPR is a significant modifying factor, as chest compressions, vasopressors and reperfusion may induce or exacerbate bleeding. Proper interpretation therefore requires careful contextual evaluation. Conclusion: Subendocardial haemorrhages are common but non-specific findings at autopsy. Their correct interpretation demands understanding of underlying pathophysiological mechanisms, consideration of CPR-related effects and systematic correlation with the mechanism of death. Standardized and quantitative cardiac morphometry, supported by digital measurement techniques, may reduce subjective variability and enhance diagnostic reliability in forensic practice.

Session IX.

Neznámé látky, reálná rizika: jak zvládáme držet krok?

Chomynová P., Grohmannová K.
Národní monitorovací středisko pro drogy a závislosti, Úřad vlády České republiky

Systém včasného varování před novými psychoaktivními látkami (EWS) v ČR je nástrojem pro shromažďování, analýzu a sdílení informací o nových psychoaktivních látkách na národní i evropské úrovni, se zaměřením na jejich zdravotní a společenské dopady.

Fungování systému zahrnuje několik kroků: identifikaci nových látek, jejich monitorování, hodnocení rizik a případné informování veřejnosti prostřednictvím varování. Do systému je zapojena široká síť odborných institucí a organizací a zároveň probíhá úzká spolupráce s evropskými partnery, zejména Agenturou EU pro drogy (EUDA) a Europolem.

Hodnocení rizik vychází z různých zdrojů dat, jako jsou farmakologické a toxikologické studie, klinická pozorování, monitoring trhu, data z testování drog nebo informace od uživatelů. Posuzují se především zdravotní rizika (akutní a chronická toxicita, závislostní potenciál), sociální dopady (např. kriminalita) a ekonomické důsledky.

Výsledky hodnocení slouží jako podklad pro rozhodování o regulaci látek. Současně systém umožňuje rychlou výměnu informací mezi státy EU a podporuje koordinovaný postup při řešení nově vznikajících drogových hrozeb. EWS tak představuje důležitý nástroj pro včasnou identifikaci rizik a ochranu veřejného zdraví v oblasti nových psychoaktivních látek.

Pracoviště forensní chemie Policie České republiky Královéhradeckého kraje a jeho spolupráce s Ústavem klinické biochemie a diagnostiky Fakultní nemocnice v Hradci Králové

Halamek M.
Odbor kriminalistické techniky a expertiz, Služba kriminální policie a vyšetřování, Krajské ředitelství policie Královéhradeckého kraje, Hradec Králové

Prezentace představí činnost pracoviště forensní chemie Policie České republiky Královéhradeckého kraje, jehož hlavním úkolem je analýza kriminalisticky relevantních materiálů pro potřeby orgánů činných v trestním řízení. Úvodní část se zaměří na statut a organizační strukturu pracoviště, jeho postavení v rámci Policie České republiky a klíčové kompetence, které určují jeho roli při odhalování a dokumentaci nejzávažnější trestné činnosti. Následně budou představeny hlavní odborné činnosti laboratoře, zahrnující identifikaci omamných a psychotropních látek, léčiv, prekurzorů drog, jedů a dalších chemických materiálů.

Druhá část prezentace stručně představí velké analytické laboratorní systémy, které tvoří technologické jádro pracoviště, a také nejdůležitější mobilní prostředky pro identifikaci látek v terénu, využívané při operativním šetření i při podpoře zásahových a vyšetřovacích týmů.

Třetí část prezentace nabídne přehled vybraných nejnebezpečnějších substancí, které byly pracovištěm forensní chemie analyzovány v posledních dvou letech. Půjde zejména o látky představující vysoké riziko pro veřejné zdraví i bezpečnost, včetně nově se objevujících psychoaktivních substancí a toxických materiálů spojených s nejzávažnější trestnou činností.

Závěrečná část se zaměří na odbornou spolupráci s Ústavem klinické biochemie a diagnostiky Fakultní nemocnice v Hradci Králové. Tato spolupráce zahrnuje vzájemnou výměnu reálných vzorků z případů trestné činnosti, sdílení referenčních standardů omamných a psychotropních látek, odborné konzultace analytiků, společná školení lékařů, a výměnu analytických informací při řešení složitých případů souvisejících s návykovými látkami. Prezentace ukáže, že vzájemná spolupráce obou pracovišť má velký potenciál nejen pro identifikaci nových psychoaktivních substancí v rámci odhalování trestné činnosti, ale současně obohacuje odbornou

činnost Ústavu klinické biochemie a diagnostiky, který díky ní získává rychlejší a přesnější informace o nově se objevujících látkách v rámci léčby intoxikovaných pacientů.

From party to postmortem: Fatal Poppers Methemoglobinemia

Gavronová A.[1,2]; Vitovják M.[1] Pilnaj D.[3]; Stoklas M.[4],Ondra P.[1,2]
[1]Department of Forensic Medicine and Medical Law, Faculty Hospital Olomouc, Czech Republic [2]Department of Forensic Medicine and Medical Law, Faculty of Medicine and Dentistry, Palacký University in Olomouc, Czech Republic
[3]Department of Electrotechnology. Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic
[4]Chromservis Company Prague

Background: Alkyl nitrites ("poppers"), including amyl nitrite, are volatile vasodilators typically misused by inhalation for a short-lasting euphoric "rush" and for sexual effects related to smooth-muscle relaxation. While effects are usually transient, significant toxicity can occur through oxidation of hemoglobin to methemoglobin, leading to profound functional hypoxia, cyanosis, cardiovascular collapse, and death. Severe outcomes are more likely after high-dose exposure, atypical routes such as oral ingestion, and in the presence of co-intoxicants or concomitant vasodilators. Case presentation: A 44-year-old man was admitted to an emergency department and died shortly after admission despite intensive resuscitation. Clinical findings prior to death included marked cyanosis and severe hypotension (60/30 mmHg). Methemoglobinemia measured shortly before death reached critical level 95%. Autopsy findings: Autopsy revealed chemical injury of the middle and lower esophageal mucosa and approximately 400 g of green-yellow, intensely "technical/solvent-like" smelling gastric content; the gastric mucosa was hyperemic with petechial hemorrhages. No lethal traumatic injuries were identified. Toxicology: Using GC-MS, amyl nitrite was detected in premortem blood and in postmortem blood and gastric content. In both premortem and postmortem blood, 2-methyl-1-butanol and n-pentanol were present, consistent with degradation products of ingested amyl nitrite. Additional substances included ethanol, THC (3.2 ng/mL) and THCCOOH (50.5 ng/mL) in blood, pregabalin 4.3 mg/L (within therapeutic range), trace methamphetamine/amphetamine, and iatrogenic agents. Postmortem methemoglobin decreased to 4.1%, highlighting interpretative pitfalls if only postmortem values are available. Conclusion: This case demonstrates that unusual oral amyl nitrite exposure can be rapidly fatal via extreme methemoglobinemia with tissue hypoxia.

Session X.

Suicide commited with a homemade firearm with electrical initiation

Šafr M.[1,2], Kovařík D.[1,2], Ublová M.[1,2]
[1]Department of Forensic Medicine, Faculty of Medicine in Hradec Králové, Charles University, Šimkova 870, 500 03, Hradec Králové
[2]Department of Forensic Medicine, University Hospital Hradec Králové, Sokolská 581, 500 05 Hradec Králové

Suicide committed with a homemade firearm may, in certain cases, carry the risk of overlooking an unusually constructed weapon at the crime scene and of misinterpreting the resulting injuries during forensic examination. In some cases, however, the unusual design of a weapon results in an unusually extensive or even devastating injury. The authors present a case of suicide committed with a homemade single-shot long firearm of 17.5 mm calibre, equipped with electrical initiation using a lead-acid rechargeable battery, employing homemade ammunition under domestic conditions, and the devastating head injury caused by this weapon and ammunition.

Úkladná vražda s viacnásobným strelným poranením

Kováč M., Girašková O.
Súdnolekárske a patologicko anatomické pracovisko UDZS Prešov

V roku 2008 došlo k vražde podnikateľa krátkou guľovou zbraňou, s viacnásobným strelným poranením v oblasti trupu a končatín. Na základe balistickej analýzy vzniknutých strelných poranení a stôp na mieste činu bolo možné jednoznačne určiť polohu strelca, ktorá bola v rozpore s výpoveďou svedka.

Slovak roulette

Kutiš E., Petránová R., Kováč M., Ťažký B.
Health care surveillance authority (ÚDZS), Forensic and pathological- anatomical unit Wolkerova 32, Banská Bystrica

Background: Forensic evaluation at the crime scene is often times challenging and close cooperation between forensic pathologists and specialized police units is essential. In the presented case, an apparently ordinary friendly visit ended in a fatal event subsequently staged as an accidental outcome of a game of Russian roulette. In this context, professional expertise in forensic medicine and forensic ballistics proved to be crucial. Aim: To highlight the importance of interdisciplinary cooperation in the investigation of firearm-related deaths, including the presence of a forensic pathologist at the scene, and to emphasize the significance of autopsy findings—particularly projectile recovery and determination of wound trajectories—in the final evaluation of complex cases involving multiple decedents. Material and Methods: Crime scene investigation in which two adult male bodies with evident gunshot injuries were found, while two firearms were present at the site. On-site evaluation of ballistic traces and detailed examination of the bodies at the scene were performed in addition to the main autopsy findings. Results: The evaluation of the injuries present on the bodies was crucial for the subsequent search for bullets. Based on the ballistic conclusions, which enabled identification of the firearm used, and on the findings obtained during examination of the bodies at the scene and in the autopsy room, the investigation could focus on a specific scenario of events, including consecutive use of the weapon. It was also possible to establish the presumed sequence of events preceding the shooting itself. At the same time, this analysis helped rule out the presence of a third person at the scene who could have participated in the deaths of the deceased individuals. Conclusion: Detailed examination of the bodies at the scene in cooperation with specialized police personnel is irreplaceable, as are the autopsy findings, including determination of the gunshot wound channel in connection with projectile recovery. Such evaluation requires specific knowledge and a high degree of experience, which are crucial for proper case resolution.

The lethal reach of the table knife: a case of transorbital penetrating brain injury

Kováč P.[1], Rudnay M.[2], Moravanský M.[1], Očko P.[3]
Ústav súdneho lekárstva a súdnolekárskej toxikológie LF UK, Bratislava
[2]II. radiologická klinika Lékařskej fakulty Univerzity Komenského a Onkologického Ústavu sv. Alžbety
[3]Sudnolekárske pracovisko UDZS Bratislava

The human skull generally provides robust protection against low-energy mechanical trauma. However, its integrity is compromised in regions of anatomical vulnerability, such as the foramina and areas of thin cortical bone. The orbit, characterized by its thin osseous walls, represents a high-risk portal for intracranial penetration. While the pediatric cranium is particularly susceptible—specifically the squamous portion of the temporal bone—the orbit remains a primary site of vulnerability across all age groups. A review of current literature identifies various case reports of transorbital penetrating brain injuries (TPBI). Clinical outcomes range from full recovery to permanent neurological deficits or death, typically resulting from meningitis, cerebral edema, or intracranial hemorrhage. Unlike high-velocity projectile or ballistic trauma, stab-induced penetrating brain injuries are characterized by localized damage, primarily restricted to the wound tract. Reported instruments of

such injuries vary widely, including knives, screwdrivers, scissors, and even seemingly innocuous objects like toothbrushes or knitting needles. We present a case of a fatal TPBI occurring within a low-security prison facility. During an altercation, the victim was assaulted with a standard cutlery knife. The blade penetrated the left orbit, traversing the intracranial space until it was arrested by the occipital bone. The weapon remained in situ post-assault; the victim presented in a comatose state with a poor neurological prognosis and succumbed to the injuries after three days. This report details the correlation between clinical presentation, computed tomography (CT) imaging, and forensic autopsy findings of this exceptionally rare and lethal injury mechanism.

Off the wall

Hamerlik L., Gavronová A., Spurná J., Ondra P.
Ústav soudního lékařství a medicínského práva Fakultní nemocnice Olomouc

Background: In fatal assaults to the head, patterned injuries can provide a direct bridge between autopsy findings and investigative leads. We report a forensic autopsy–focused synthesis of a death caused by repeated stomping to the head, highlighting a distinctive V-shaped patterned scalp injury and corresponding footwear traces linked to certain brand of shoes. Materials and Methods: A complete forensic autopsy was performed (external and internal examination with extensive head/neck and facial dissection). Documentation included injury mapping, assessment of patterned lesions, and correlation with case materials describing footwear impressions at the scene. Ancillary investigations comprised histology of brain and lungs and standard toxicology screening. Results: Autopsy revealed massive blunt-force head trauma dominated by devastating comminuted fractures of the midface (orbits, maxillae, zygomas, nasal skeleton) with extensive soft-tissue crushing. The scalp showed multiple contusions and subcutaneous hemorrhages with patterned formations, including hemorrhages suggestive of an inverted “M” and a distinct “V” configuration on the left parietal region—highly compatible with a footwear tread imprint. The mechanism was consistent with repeated stomps to the face and head against a firm surface; the extent of injury supported approximately ten or more stomps, with additional impacts possible. Evidence of blood aspiration and swallowing was present (blood in airways/lungs; ~950 mL blood-stained gastric content with proximal intestinal blood). Conclusion: Death resulted from severe blunt head trauma with brain contusion and cerebral edema, plausibly accelerated by blood aspiration. Patterned “V” scalp hemorrhages, together with scene shoeprints attributed to certain brand of footwear, illustrate how autopsy morphology can rapidly narrow investigative focus.

Vražda zapísaná v kostiach / Murder recorded in the bones

Zdarilek M., Kóša R., Bohoňová B.
Úrad pre dohľad nad zdravotnou starostlivosťou, Nitra, Slovensko

V extraviláne medzi poľnohospodárskymi pozemkami bola objavená ľudská lebka, pričom následným prehľadaním terénu bola zaistená takmer kompletná kostra. Už makroskopické, avšak veľmi detailné hodnotenie kostných lézií na mieste nálezu vzbudilo podozrenie na násilnú smrť. Systematická súdno-lekárska a antropologická analýza preukázala prítomnosť viacerých štrbinovitých defektov s ostrými okrajmi bez známok reparácie, hodnotiteľných ako perimortálne bodno-rezné poranenia. Prevažujúca dorzálna lokalizácia poranení v oblasti krčnej chrbtice a hrudníka svedčila pre opakované pôsobenie ostrého nástroja inou osobou. Prípad poukazuje na skutočnosť, že aj izolovaný skelet môže umožniť spoľahlivo rekonštruovať mechanizmus násilnej smrti. A human skull was discovered in an open rural area between agricultural fields, and a subsequent search of the terrain led to the recovery of an almost complete skeleton. Even the initial macroscopic yet detailed assessment of bone lesions at the scene raised suspicion of violent death. A systematic forensic medical and anthropological analysis revealed multiple slit-like defects with sharp margins and no signs of healing, consistent with perimortem stab and incised injuries. The predominantly dorsal distribution of injuries in the region of the cervical spine and thorax indicated repeated action of a sharp instrument by another person. The

case demonstrates that even an isolated skeleton may allow for reliable reconstruction of the mechanism of violent death.

Session XI.

Children as a Nuisance

Ublová M., Šafr M.
Ústav soudního lékařství LF Hradec Králové a FN Hradec Králové

The Authors present a case of double neonaticide committed by a drug-addicted mother over a period of four years. The 29-year-old woman was caring for two children aged four and five. During this time, she delivered two additional newborns, whom she perceived as a burden and subsequently killed. The case came to light after severe postpartum hemorrhage following her most recent concealed delivery, whereupon the bodies of two newborns were discovered in her home. This case is noteworthy not only for the circumstances of its discovery but also for the unusual location in which the remains were hidden.

Neobvyklý mechanismus třesení

Vlčková A.
Krajská zdravotní a.s., Masarykova nemocnice Ústí nad Labem o.z., oddělení soudního lékařství a toxikologie

Pojem shaken baby syndrom zpravidla evokuje mechanismus aktivního zatřesení kojencem, kterého drží dospělá osoba. Prezentovány dva případy, kdy kojenec utrpěl závažné nitrolební změny s trvalými následky při aktivitě, u které nikoho nenapadlo, že by mohla být problematická. I cesta na nákup či dětská hra mohou být totiž za určitých okolností velmi rizikové.

An unexpected finding in the bushes

Briškárová V.[1], Farkašová Iannaccone S.[1], Labaj P.[2]
[1]Ústav súdneho lekárstva, Lekárska fakulta UPJŠ, Košice
[2]Pracovisko sudneho lekarstva a patologickej anatomie, UDZS, Košice

Background: Neonaticide is the term used to describe the killing of a newborn by the mother within the first 24 hours of life. In criminology and forensic psychiatry, neonaticide is differentiated from infanticide; this distinction is important because neonaticide often has different psychological, social, and situational characteristics compared to other forms of child homicide. In the last 30 years the incidence of homicide connected to children younger than the age of 1 year has increased. Some studies found that children of age less than 1-year old are at 4 times greater risk of being murdered than any other age group, with the 1st day of life being the highest risk. It has been estimated that up to 10% of SIDS cases are actually undetected homicides. The majority of newborns killed in the first day are born out of a hospital, usually at the mother's home, although there are recorded cases of neonaticides in birthing units. Many studies report a higher rate of infanticide of male than female infants in industrialized western nations. Case presentation: This is a case report of a newborn of unknown identity, born in an apartment. The mother went out onto the balcony of the apartment with the newborn, cut its umbilical cord with a shard of glass, and threw the placenta off the balcony. She placed the newborn in a plastic bucket, where she also placed a duvet, blanket, jacket and pillow on it. Then she carried the bucket to a meadow in the bushes. The newborn was found after few days in a plastic bucket in a meadow near the street of the incriminated apartment. In this case was suspicion of neonaticide caused by distressed mother because of childbirth. Author presents forensic evalution of all parameters related to this type of criminal act. According to autopsy findings the criminal prosecution was initiated. Physical assault by her partner, the newborn's father, which preceded the birth, contributed to childbirth distress and action of mother. Conclusions: According to researches neonaticide

is frequently associated with concealed or denied pregnancy, social stigma, lack of support, and acute psychological stress surrounding childbirth. In legal contexts, neonaticide is usually prosecuted as homicide, but some jurisdictions recognize reduced responsibility when the act is connected to the psychological effects of childbirth.

Idiopathic Neonatal Hepatitis: Clinical and Pathomorphological Analysis

Hai R.[1], Bajaj J.[1], Bizik J.[1], Babiak F. [2], Janik M.[1,2], Straka L.[1,2]
[1]Forensic and Pathological-Anatomical Unit, Health Care Surveillance Authority, Martin
[2]Department of Forensic Medicine and Medical Expertise, Jessenius Faculty of Medicine, Comenius University in Bratislava, University Hospital Martin, Martin

Neonatal hepatitis (NH) is a severe liver disorder occurring within the first months of life, characterized by a heterogeneous etiology, most commonly infectious. However, in a subset of cases, the underlying cause remains unidentified, and a diagnosis of idiopathic neonatal hepatitis is established.We present a case report of a preterm neonate with fulminant hepatic failure. Despite comprehensive diagnostic evaluation and intensive therapeutic management, including intravenous immunoglobulin (IVIG) administration and exchange transfusion for suspected gestational alloimmune liver disease (GALD), the infant died at 26 days of age.This case highlights the diagnostic complexity of neonatal hepatopathies and underscores the critical role of autopsy in establishing the definitive diagnosis.

Between Scent and Silence: Death Following Deodorant Inhalation

Štufka V.[1], Toupalík P.[1], Židková M.[2]
[1]Ústav soudního lékařství 1. LF UK a VFN v Praze
[2]Ustav klinické a soudní toxikologie 1. LF UK a VFN v Praze

The authors present a case report of a 15-year-old boy who died following the intentional inhalation of aerosolized contents from commercially available deodorant sprays. Toxicological analysis was negative due to the high volatility and rapid elimination of these inhaled substances. In the context of the anamnestic data, the circumstances of death, and comparison with previously published case reports focused on the inhalation of related gases, the histological examination provided key support for the conclusion of an inhalational etiology of death.

Session XII.

Unseen Trajectories: Multimodal Reconstruction of a Cervical Gunshot Injury Without a Retained Projectile

Barletta C.,[1]Pinacchi M.P.,[1]Francaviglia M.,[1]Chisari M.,[2] Di Mauro L.
[1]Department of Medical, Surgical and Advanced Technologies "G.F. Ingrassia", University of Catania, Catania, 95121
[2]Faculty of Medicine and Surgery, "Kore" University of Enna, 94100 Enna

Background: Reconstructing cervical firearm injuries is particularly challenging due to the density of vital structures and frequent absence of retained ballistic elements requiring integrated analysis of imaging, wound morphology, clothing examination, and targeted anatomical dissection. Aim: This report describes the accidental fatal shooting of a young man who was unintentionally struck by a projectile intended for another individual. Materials and Methods: Post-mortem CT (PMCT) performed prior to autopsy showed no retained bullet or fragments, confirming the importance of cross-sectional imaging when external findings alone cannot explain projectile dynamics. Clothing analysis revealed two perforations in the hood of the victim's vest, consistent with the suspected trajectory. External examination identified a single circular entrance wound in the

right lateral neck, with hemorrhagic margins and an abrasion collar; no exit wound was observed. Results: Autopsy utilized a fan-shaped laterocervical dissection to expose deep structures. This revealed an oval defect in the right sternocleidomastoid muscle and extensive hemorrhagic infiltration of surrounding soft tissues. A complete laceration of the right internal jugular vein was identified, an injury known to cause rapid fatal hemorrhage. Intraoral inspection disclosed two tongue wounds containing synthetic fibers consistent with the victim's jacket padding. A displaced molar and a fresh alveolar socket marked the terminal portion of the wound track. The combined clothing and intraoral findings were crucial for reconstructing the atypical projectile path, particularly in the absence of a retained bullet and exit wound. Conclusion: Death resulted from massive hemorrhage and hypovolemic shock due to disruption of the internal jugular vein. This case underscores the forensic value of integrating PMCT, meticulous anatomical dissection, and clothing fiber analysis to accurately reconstruct firearm injuries, especially in anatomically complex regions such as the neck and when the projectile is not recovered.

Hide and Seek with a Bullet: When Judicial Inspection Becomes Essential

Pantè G.G., Ministeri F., Vanaria F., Mauro L., Chisari M.
Legal Medicine, Department of Medical, Surgical and Advanced Technologies, "G.F. Ingrassia", University of Catania, 95123 Catania, Italy

Background: Firearm-related deaths present a notoriously wide spectrum of injury patterns. Their intrinsic variability often obscures projectile trajectories, creating significant challenges for the forensic pathologist when reconstructing the dynamics of a violent event. Judicial inspection and crime scene analysis become indispensable, providing crucial spatial and contextual information that cannot be obtained from autopsy or imaging alone. A multidisciplinary approach, including forensic CT scanning, thus plays a decisive role in revealing concealed ballistic pathways and ensuringaccurate medico-legal interpretation. Aim: This study illustrates how judicial inspection, integrated with CT imaging and autopsy findings, can be pivotal in resolving apparent inconsistencies in firearm wound interpretation. Materials and Methods: A 45-year-old man was found deceased, lying supine on a rural asphalt road in the Sicilian countryside. External examination revealed five firearm wounds: four anterior wounds consistent with entrance injuries and one posterior wound presenting macroscopic features of an exit wound. A total-body CT scan identified four retained bullets within the body. Results: A discrepancy emerged between the number of wounds and the number of retained bullets detected on CT. Through meticulous external examination, correlation with injury morphology, and—critically—judicial inspection of the scene and body position, the sequence of events was reconstructed. The bullet responsible for the posterior exit wound had been fired when the victim was already lying on the asphalt. After exiting, it struck the ground, ricocheted, and re-entered the body through the same exit wound, accounting for its unexpected presence on CT and at autopsy. Conclusions: This case shows how crime scene inspection is an irreplaceable forensic tool, especially in complex firearm cases where ballistic behavior is unpredictable and wound patterns may be misleading. The integration of scene analysis with CT imaging and autopsy prevented a misinterpretation of wound dynamics, enabling a correct reconstruction of the shooting sequence and the victim's final position. Judicial inspection with imaging and autopsy provide essential contextual data that can reveal hidden ballistic trajectories.This multidisciplinary approach is vital for accurately reconstructing events in firearm-related deaths—the most challenging and variable category of forensic casework.

Silent Toxicity at Sea: Forensic Lessons from Two BTEX-Related Migrant Deaths in a Confined Ship Hold

Francaviglia M., Francaviglia F., Pante G.G., Chisari M., Esposito M.
Department of Medical, Surgical and Advanced Technologies "G.F. Ingrassia", University of Catania, Catania, 95121, Italy

Background. Migrant transport across the Mediterranean increasingly involves prolongedconfinement in poorly ventilated ship holds where gasoline canisters are stored, exposingindividuals to potentially lethal

concentrations of BTEX compounds. Although BTEX exposure iswell-documented in occupational and environmental health research, fatal inhalational intoxicationin maritime migration settings remains underrecognized, especially when decomposition limitstraditional autopsy interpretation. Recent studies confirm the significant toxicity and mortality risksassociated with ambient or occupational BTEX exposure in both enclosed indoor environments andhighemission settings, emphasizing the need for forensic awareness.Case presentation. Two adolescent males were found deceased aboard a migrant vessel ininternational waters after reported confinement inside a fuel-contaminated hold containing ~25–30gasoline canisters. Totalbody CT showed advanced decomposition, widespread gas distribution,mild pleural effusions, and no traumatic injury. Autopsy revealed intact airways, unremarkablecardiovascular structures, and no specific organ pathology beyond nonspecific pulmonary edema.Histology was markedly autolytic. Targeted toxicology quantified BTEX in lung tissue (benzene0.22–0.50 mg/kg; toluene 0.36–0.88 mg/kg; ethylbenzene 0.06–0.12 mg/kg; xylenes 0.06–0.16mg/kg), supporting intense inhalational exposure.Discussion. In advanced decomposition where classical signs of asphyxia or cardiotoxicity areabsent, BTEX intoxication must be actively considered in confinedspace deaths involving fuelvapors. Recent environmental and occupational literature highlights BTEX's strong association withincreased mortality and significant carcinogenic/acute toxicity potential, particularly benzene andtoluene. These data reinforce the plausibility of fatal outcomes even in short-term exposure withinenclosed volumes.Conclusion. These cases demonstrate that acute BTEX inhalational poisoning is an emergingforensic scenario in maritime migrant deaths. Key forensic updates include prioritizing BTEXtoxicology when decomposition obscures autopsy findings, recognizing confinedspace exposurepatterns, integrating environmental/occupational BTEX research into forensic interpretation andimplementing standardized sampling protocols in suspected fuelvapor deaths. Forensic pathologistsshould maintain a high index of suspicion in similar maritime contexts.

Fatal Neurotoxicity After Intraventricular Gadolinium: Forensic Insights from a Sentinel Healthcare Error

Pinacchi M.P.[1], Di Natale V.[1], Franco S.[1], Vanaria F.[2], Esposito M.[3]
[1]Department of Medical, Surgical and Advanced Technologies "G.F. Ingrassia", University of Catania, Catania
[2]Director of the Provincial Health Office, Italian National Police, Catania
[3]Faculty of Medicine and Surgery, "Kore" University of Enna, 94100 Enna

Background Gadolinium-based contrast agents (GBCAs) are widely considered safe when administered intravenously; however, direct exposure of the central nervous system (CNS) to gadolinium produces profound neurotoxic effects via calcium dysregulation, mitochondrial injury, and inflammatory mechanisms. Fatalities following inadvertent intrathecal or intraventricular administration are increasingly reported, highlighting their medico-legal relevance. Aim This study aims to present the postmortem findings of a fatal intraventricular gadolinium administration, and to evaluate the forensic significance of neuropathological changes in reconstructing the mechanism of death and identifying systemic clinical-risk failures. Material and Methods A 56-year-old woman with an external ventricular drain (EVD) underwent MRI in 2022, during which gadobutrol was unintentionally injected through the ventricular catheter instead of intravenously. Complete autopsy was performed with extensive neuropathological sampling. Findings were interpreted in the context of published evidence on gadolinium neurotoxicity, including known cases of encephalopathy, CSF gadolinium accumulation, and fatal outcomes after intrathecal exposure. Results Autopsy revealed diffuse cerebral destruction with cortical and brainstem necrosis consistent with direct gadolinium neurotoxicity. Similar patterns have been described where gadolinium reached the CSF, producing T1-shortening, encephalopathy, and severe neurological decline due to toxic accumulation. The temporal correlation between administration and immediate clinical deterioration, combined with histopathological confirmation, established a clear toxic mechanism of death. Conclusion This case confirms that intraventricular gadolinium administration is uniformly catastrophic, producing identifiable neuropathological signatures that are highly informative for forensic causation analysis. The event illustrates a critical risk-management failure, reinforcing the need for strict line-verification protocols when high-alert substances are used in the presence of ventricular or intrathecal access. Recognition of gadolinium-induced neurotoxicity at autopsy, supported by recent literature, enhances diagnostic confidence and contributes to accurate reconstruction of healthcare-related sentinel events.

Aplikovateľnosť DLLME pre extrakciu xenobiotík z moču; DLLME ako alternatíva klasickej LLE

Jurášeková P., Čajdova J., Straka Ľ.
Súdnolekárske a patologicko-anatomické pracovisko ÚDZS, Martin

Autori prezentujú vývoj a implementáciu disperznej mikroextrakcie kvapalina-kvapalina (DLLME) ako alternatívy ku konvenčne používaným extrakčným technikám, ako je extrakcia kvapalina-kvapalina (LLE) a extrakcia tuhou fázou (SPE), pri príprave vzoriek moču pre toxikologickú analýzu. Vývoj miniaturizovaných extrakčných postupov vychádza z požiadaviek na znižovanie spotreby organických rozpúšťadiel, skracovanie času prípravy vzorky a implementáciu princípov zelenej chémie do rutinnej laboratórnej praxe. DLLME je založená na disperzii malého objemu extrakčného rozpúšťadla do vodnej matrice za vzniku jemnej emulzie, čím dochádza k rýchlemu a efektívnemu prestupu analytov do organickej fázy. V rámci práce boli optimalizované parametre metódy (typ a objem extrakčného a disperzného činidla, pH vzorky) pri použití modelového liečiva tramadolu. Metóda bola následne validovaná v rozsahu parametrov kvalitatívnej konfirmačnej analýzy a jej extrakčná účinnosť bola porovnaná s rutinne používanou LLE. Výsledky poukazujú na potenciál DLLME ako vhodnej alternatívy pre implementáciu do rutinnej toxikologickej praxe.

The Fatal Intersection of Chronicity and Acuity: A Forensic Analysis of Sudden Cardiac Death in Polysubstance Abuse

Di Natale V.[1], Cotroneo A.D.[1], Carnazza G.[2], Pantè G.G.[1], Ragazzi G.[1], Barbera N.[2]
[1]Department of Medical, Surgical and Advanced Technologies "G.F. Ingrassia", University of Catania, Catania, 95121, Italy
[2]Department of Medical, Surgical and Advanced Technologies Sciences "G.F. Ingrassia", University of Catania, 95125 Catania, Italy

Background: Sudden Cardiac Death (SCD) associated with chronic alcohol and polysubstance use represents a complex diagnostic challenge. Aim: This case highlights the interaction between structural myocardial damage, chronic toxic exposure, and acute metabolic imbalance, underscoring the importance of a multidisciplinary forensic approach. Materials and Methods: A 67-year-old man with a history of chronic alcohol and narcotic dependence was found deceased. Autopsy revealed no traumatic injuries, suggesting an endogenous cardiac cause. The heart showed features of dilated cardiomyopathy with marked ventricular wall thinning (RV: 0.4 cm; LV: 0.8 cm), consistent with toxic-induced myocardial damage. Histology demonstrated replacement fibrosis, contraction band necrosis, and myofiber waviness and disruption, indicating acute myocardial stress preceding a fatal arrhythmia. Liver examination showed severe steatosis and fibrotic septal expansion, confirming chronic metabolic impairment. Toxicological evaluation integrated blood and segmental hair analysis to reconstruct substance use. Blood alcohol concentration was 1.34 g/L, indicating acute intoxication at death. Hair analysis confirmed long-term polysubstance use, including cocaine (2.12 ng/mg) and elevated ethylglucuronide (1,223.85 pg/mg). Detection of cocaethylene (0.16 ng/mg) demonstrated concurrent alcohol and cocaine intake. Results: Myofiber disruption supports acute myocardial stress immediately preceding the fatal arrhythmia. Cocaethylene, characterized by a prolonged half-life and strong pro-arrhythmogenic properties, likely acted as a key trigger of cardiac instability. Conclusion: Death resulted from a synergistic mechanism. Pre-existing alcohol-induced dilated cardiomyopathy, combined with acute ethanol intoxication and cocaine-related cardiotoxicity, created conditions for sudden cardiac arrest. This case underscores the value of advanced toxicological reconstruction of substance use history for accurate and defensible medicolegal determinations.

When Bone Fragility Clouds the Forensic Picture: Disentangling Suspected Osteogenesis Imperfecta from Abuse in a Case of Shaken Baby Syndrome

Ministeri F.[1], Pante G.G.[1], Francaviglia M.[1], Salerno M.[1], Esposito M.[2]
[1]University of Catania, Catania, Italy
[2]Faculty of Medicine and Surgery, "Kore" University of Enna, 94100 Enna

Background: The forensic diagnosis of Abusive Head Trauma (AHT), particularly Shaken Baby Syndrome (SBS), requires a rigorous integration of clinical, radiological, ophthalmologic, and biomechanical evidence. Suspected osteogenesis imperfecta (OI) may introduce diagnostic ambiguity. Forensic practitioners must differentiate between trauma compatible with bone fragility and patterns that reflect violent acceleration–deceleration mechanisms. Aim: This poster aims to illustrate, from a forensic perspective, the diagnostic challenges posed by suspected SBS in the context of possible OI and to emphasize how injury pattern analysis, biomechanical plausibility, and multi-system coherence guide medico-legal conclusions. Material and Methods: The presentation is based on a 6-month-old premature infant admitted in respiratory arrest. Clinical evaluation, neuroimaging (CT and MRI), serial radiographs, ophthalmologic examination, and medico-legal assessment were performed. The child presented scleral bluish discoloration and a maternal history suggestive of OI. Radiological review included evaluation of long bones, ribs, and cranial findings. Particular attention was paid to fracture pattern, timing, and distribution. Results: Neuroimaging identified multiple subdural hemorrhages of differing ages and diffuse parenchymal damage. Ophthalmologic assessment revealed extensive bilateral retinal and preretinal hemorrhages. The skeletal survey showed no acute long bone fractures but demonstrated posterior rib remodeling consistent with healed fractures. Critically, the location and characteristics of these rib injuries, restricted to classic squeezing regions, did not match typical OI-associated fracture patterns, which usually occur in the context of generalized bone fragility and multiple skeletal lesions. The intracranial and ocular constellation was highly specific for AHT and incompatible with spontaneous or low-impact mechanisms. Conclusion: This case highlights how suspected OI may complicate the forensic evaluation of suspected child abuse. While OI can predispose to fractures, it does not account for multi-age subdural hemorrhages, diffuse brain injury, and extensive bilateral retinal hemorrhages. Forensic assessment must therefore prioritize the integrated analysis of all injuries rather than the mere presence of a pre-existing skeletal condition. Maintaining this approach is essential to uphold scientific accuracy and judicial reliability.

Fatal High-Energy Falls: Multimodal Forensic Assessment and Current Advances in PMCT-Guided Injury Reconstruction

Cotroneo D.A., Pinacchi M.P., Barletta C., Franco S., Di Mauro L.
University of Catania, Catania (Italy)

Background: In major blunt trauma fatalities, the combined use of external examination, post-mortem CT (PMCT), autopsy, histology, and toxicology allows optimal reconstruction of the injury mechanism and cause of death. Recent studies reaffirm PMCT as an indispensable complementary tool, especially for skeletal injuries, though it cannot replace autopsy for soft-tissue assessment or definitive cause-of-death determinations. PMCT has become crucial in high-energy trauma cases and free-fall fatalities due to its ability to detect complex fracture patterns and assist in event reconstruction. Case and Methods: A female (apparent age 40–45) was discovered outdoors. Environmental parameters included ambient temperature 19°C and core temperature 32.6°C; lividity and early rigor were present without decomposition. External examinations documented multiple abrasions, contusions, and lacerations across several anatomical regions. Whole-body PMCT preceded a full autopsy with histology and broad toxicological screening (blood, urine, gastric content, brain, hair). Results: PMCT and autopsy revealed severe polytrauma: Head/Neck: bilateral nasal and septal fractures, occipital condyle fracture, massive subarachnoid hemorrhage with intraparenchymal and intraventricular bleeding. Thorax: extensive bilateral comminuted rib fractures, hemopneumothorax, pulmonary contusions. Abdomen: splenic rupture, hepatic lacerations. Axial skeleton: multiple thoracic/lumbar vertebral fractures and pelvic–hemisacral fractures. The injury distribution matches recent data on high-energy falls, typically dominated by

axial skeletal damage with marked bilateral involvement, and differs from pedestrian impacts, aiding differential diagnosis. Blood ethanol was 1.68 g/L (gastric 2.32 g/L; brain 2.04 g/kg; urine 0.18 g/L). Alprazolam was therapeutic (72.67 ng/mL). Hair was positive for cocaine markers and EtG. Although levels were not lethal, alcohol intoxication increases the risk of accidental falls and blunt trauma. Conclusion: Cardiorespiratory arrest due to massive blunt polytrauma. Cranio-encephalic trauma alone was compatible with rapid fatality. The distribution and severity of injuries are consistent with a high-energy fall from height onto a hard surface, as also described in recent free-fall forensic studies. Alcohol impairment likely increased fall probability but was not directly lethal.

Fall or sudden cardiac death? A rare subvalvular origin of the right coronary artery revealed at autopsy

Di Natale V.[1], Barletta C.[1], Ministeri F.[1], Chisari M.[2], Esposito M.[2]
[1]Department of Medical, Surgical and Advanced Technologies "G.F. Ingrassia", University of Catania, Catania, 95121
[2]Faculty of Medicine and Surgery, "Kore" University of Enna, 94100 Enna

Background: Anomalies of coronary artery origin are rare conditions and may be associated with myocardial ischemia, arrhythmias, and sudden cardiac death, particularly in relation to specific anatomical variants. Subvalvular origin of the right coronary artery represents a rare congenital malformation that is scarcely reported in the literature. Aim: This case emphasizes the importance of a thorough anatomical evaluation of the coronary arteries during autopsy, even in cases of traumatic death, in order to identify congenital variants that may have potential clinical-forensic and pathogenetic relevance. Material and Methods: We describe the case of a man in his early sixties who, while performing occupational activity on a concrete beam, fell from a height of approximately 9 m and died a few minutes later. Autopsy examination revealed extensive traumatic injuries involving the cranial and thoracic regions. The Ghon block (heart and lungs) was removed and fixed in formalin for further investigations. Results: Macroscopic examination of the heart revealed an anomalous origin of the right coronary artery, arising below the right aortic valve cusp, whereas the left coronary artery showed a normal origin from the left coronary sinus. Additional findings included left ventricular hypertrophy, an aneurysmal configuration of the right ventricle, and fatty infiltration of the papillary muscles.Anomalies of coronary artery origin are rare conditions and may be associated with myocardial ischemia, arrhythmias, and sudden cardiac death, particularly in relation to specific anatomical variants. Subvalvular origin of the right coronary artery represents a rare congenital malformation that is scarcely reported in the literature. Conclusion: This case emphasizes the importance of a thorough anatomical evaluation of the coronary arteries during autopsy, even in cases of traumatic death, in order to identify congenital variants that may have potential clinical-forensic and pathogenetic relevance.

Thyroid colloid depletion and follicular activation in fatal hypothermia: two illustrative case

Zátopková L.[1, 2], Pohlová Kučerová Š.[1, 2], Kovařík D.[1, 2], Janík M.[3, 4], Hejna P.[1, 2]
[1]Department of Forensic Medicine, Faculty of Medicine in Hradec Králové, Charles University, Hradec Králové, Czech Republic
[2]Department of Forensic Medicine, University Hospital Hradec Králové, Hradec Králové, Czech Republic
[3]Department of Forensic Medicine and Medicolegal Expertises, Jessenius Faculty of Medicine in Martin, Comenius University, Martin, Slovak Republic
[4]Healthcare Surveillance Authority, Medicolegal Unit in Martin, Slovak Republic

Background: Postmortem diagnosis of fatal hypothermia remains challenging, as no single morphological finding is pathognomonic. Classical macroscopic features such as cold erythema, Wischnewski spots, or the inner knee sign form the principal diagnostic basis; however, histopathology may reveal additional adaptive changes reflecting systemic responses to cold stress. Among endocrine organs involved in thermogenesis, the thyroid gland plays a key role in metabolic adaptation to prolonged cold exposure, yet its histomorphological alterations have received little attention in forensic pathology literature.

Aim: To describe histomorphological alterations of the thyroid gland observed in fatal hypothermia and to discuss their potential value as supportive indicators of prolonged cold exposure.

Material and Methods: Two illustrative autopsy cases of accidental hypothermia were examined. Histological evaluation of the thyroid gland focused on follicular morphology, colloid characteristics, epithelial cell changes, and vascular alterations. Findings were interpreted in relation to autopsy results, circumstantial data, and the absence of alternative conditions explaining thyroid hyperactivity.

Results: Both cases demonstrated pronounced follicular activation characterized by colloid thinning, colloidophagia, focal colloid depletion, reduction of follicular size, epithelial hypertrophy with cuboid-to-columnar transformation, and vascular hyperemia. These changes occurred together with established morphological signs of hypothermia. The pattern likely reflects activation of the hypothalamic–pituitary–thyroid axis during prolonged exposure to low ambient temperature, leading to increased thyroid hormone production and enhanced metabolic heat generation. The presence of these morphokinetic changes suggests a certain survival interval and may therefore indicate sustained rather than rapidly developing hypothermia.

Conclusion: Although thyroid follicular activation is not specific to hypothermia and may occur in other stress-related conditions, it may provide supportive evidence when interpreted within a comprehensive evaluation of circumstantial findings, autopsy results, necroradiological data, toxicology, and histology. Routine histological examination of the thyroid gland in suspected hypothermia deaths may represent a valuable adjunct improving morphological interpretation of cold-related fatalities.

Session XIV.

Selected Ethical Aspects of Current Forensic Medical Practice

Farkašová Iannaccone S.
Department of Forensic Medicine, Faculty of Medicine, Pavol Jozef Šafárik University, Trieda SNP 1, 040 11 Košice

Forensic medicine is specific field of medicine with need of aplication of ethical standards. Basic ethical principles in general medical practice as beneficiency, nonmaleficiency, autonomy and justice are used in modified way. Forensic pathologist's primary duty is clarify the truth by autopsy and examination of living in connection with the legal purposes. There is necessity of postmortem dignity, confidence, objectivity, impartiallity, critical thinking and suitable communication. Nowadays, current forensic sciences with using modern technologies and artificial inteligence can bring the new ethical dilemas as responsibility, data safety, digital literacy, cognitive de-skilling etc.

The Bayesian approach in forensic medicine

Vojtíšek T.
Department of Forensic Medicine St Anne´s University Hospital Brno and Faculty of Medicine, Masaryk University

Background: Relatively little attention has been paid in the literature to the methodology of forensic medical expert reports. At the same time, increasing demands are being placed on experts, the quality of expert reports, and the transparency of experts' reasoning, both in our country and around the world. In forensic sciences, especially in forensic genetics, the use of the Bayesian probability approach in the formulation of expert conclusions has recently been expanding. In forensic medicine, this new approach is being adopted very slowly worldwide. In the Czech Republic, no forensic medical works on this topic have been published to date. Aim: to analyze and theoretically describe the entire gnoseological process leading to the formation of categorical and probabilistic expert conclusions in forensic medicine, and to present the application of the Bayesian approach in forensic medicine, including the formulation of recommendations for practice and an outline of further directions for research in this area. Methods: An analysis was performed of the individual steps that a forensic

pathologist must take in order to reach the correct conclusion in an expert opinion. Most of these steps were illustrated graphically. Because forensic medical conclusions are often only probabilistic in nature, great attention was paid to their formation and expression. As a supplementary method of processing the topic, a questionnaire survey was conducted among 50 law students and 28 forensic pathologists. Conclusion: The application of Bayesian principles in the field of forensic medicine is fundamentally possible. Recommendations for practice include the formulation of forensic conclusions as the value of the likelihood ratio of two competing hypotheses in criminal proceedings.

Session XV.

Problematic aspects of methodological procedures in law enforcement interventions

Habich L. [1], Najman T. [1], Grepl L. [1], Neureutterová K. [1,5], Hlaváčová K. [1], Víšek J. [1], Bajura J. [1], Dlouhý D. [1], Vlasák J. [1], Lopot F. [2], Kynčl M. [3], Otáhal J. [4], Kubový P. [2], Dobiáš M. [1,6]
[1]Police Academy of the Czech Republic in Prague
[2]Department of Biomedical Foundations in Kinanthropology, Faculty of Physical Education and Sport, Charles University
[3]Department of Radiology, Second Faculty of Medicine, Charles University
[4]Department of Pathophysiology, Second Faculty of Medicine, Charles University
[5]Institute of Forensic Medicine, First Faculty of Medicine, Charles University
[6]Department of Forensic Medicine and Medical Law, Faculty of Medicine and Dentistry, Palacký University Olomouc

Background: Law enforcement interventions involving physical restraint are associated with a number of adverse outcomes, the most serious being death during or immediately after the intervention. Understanding the effects of restraint techniques on the human body and, in fatal cases, ensuring proper forensic examination and interpretation are essential for all parties involved.

Material and Methods: We analyzed law enforcement interventions from tactical, biomechanical, and medical perspectives. The study is based on results of the interdisciplinary BEZNET project, focused on identifying risk factors related to the use of coercive measures and the body position of the restrained person during intervention.

Results: From a tactical perspective, the analysis addresses decision-making in different phases of the intervention, especially after control over the person has been achieved. Particular attention is paid to body position, distribution of force and body weight of officers, duration of restraint, and coordination in multi-officer interventions. Health risks were influenced not only by a specific technique, but by the overall tactical configuration, including duration and dynamics of force application. From a biomechanical perspective, the study evaluates external forces acting on the restrained body and their impact on respiratory mechanics, cardiopulmonary function, and overall physiological stress. Special attention is paid to positional factors and mechanical loading of the chest and abdomen, which may impair ventilation and contribute to hypoxic states. The risk of serious harm appears to arise mainly from cumulative biomechanical load, duration of exposure, and individual predispositions. From a medical perspective, ten cases of injury or death during restraint were reviewed. Clinical history, incident circumstances, medical examination findings, including nine autopsy reports, and the role of toxicologically relevant substances were assessed. The findings highlight the difficulty of interpretation and the need for broad differential diagnostic consideration.

Conclusion: The study contributes to a deeper understanding of the relationship between restraint tactics, biomechanical limits of the human body, and reduction of health risks for both the restrained person and the intervening officer. It provides a theoretical and analytical framework for further research and for methodological recommendations aimed at minimizing health risks while preserving intervention effectiveness and safety.

Mechanisms of death during lawful restraint: A forensic analysis of functional vital failure

Dokoupil M.
Institute of Forensic Medicine, University Hospital Ostrava, Ostrava 708 52

Background:Determining the mechanism of death during lawful restraint represents a complex challenge in forensic medicine. In many such cases, autopsy findings are minimal or nonspecific, while the fatal process is primarily functional rather than structural. These cases carry substantial medico-legal implications. Aim:To analyze mechanisms of death occurring during restraint and to evaluate the interpretative limits of morphological findings in the context of functional vital failure. Material and Methods:We present a case series of deaths temporally associated with restraint by law enforcement officers. Inclusion required the availability of digital documentation allowing detailed reconstruction of the events preceding death. All cases underwent full forensic autopsy and complementary laboratory testing. Results:Autopsy findings revealed a consistent pattern of nonspecific morphological changes insufficient for unequivocal determination of the exact mechanism of death. Correlation with digital evidence and medical history indicates a multifactorial process involving physiological stress, positional factors, and impaired ventilatory function. In several cases, features consistent with a delirious state and severe neurohumoral dysregulation were present. Conclusion:Deaths during restraint frequently result from a complex interaction between functional physiological failure and external mechanical factors rather than from isolated traumatic injury. Recognition of these predominantly functional mechanisms is crucial, as their morphological correlates may be subtle. Accurate medico-legal assessment therefore requires an integrated analysis of autopsy findings, clinical context, and situational evidence.

Session XVI.

Mushrooms, Gummies and Hallucinogen: LC-MS/MS Analysis of Muscimol

Papoušek R., Staňková M., Gebauerová V., Šištík P.
Institute of Forensic Medicine, University Hospital Ostrava, Ostrava

Background: Muscimol is a naturally occurring isoxazole alkaloid and the primary psychoactive compound found in certain species of the Amanita genus of mushrooms, particularly in A. muscaria and A. pantherina. Alongside muscimol, these mushrooms also contain ibotenic acid and trace amounts of muscarine and muscazone. Muscimol acts as a potent GABA-A receptor agonist, leading to central nervous system depression. Intoxication typically manifests as alternating states of excitation (delirium, hallucinations, muscle fasciculations) and phases of deep sleep or coma. While nausea and disorientation frequently necessitate hospitalization, fatal poisonings are exceedingly rare. The analytical detection of muscimol and its precursor, ibotenic acid, in biological matrices remains challenging due to their high polarity, low molecular weight, and poor retention on conventional reversed-phase (RP) chromatographic columns. Aim: The aim of this presentation is to introduce a field-proven liquid chromatography-tandem mass spectrometry (LC-MS/MS) method for the detection of muscimol and ibotenic acid in biological material. Material and Methods: The methodology utilizes LC-MS/MS following the pre-column derivatization of muscimol and ibotenic acid into bis-dansyl derivatives. The method was applied to biological samples from clinical cases of intoxication and to jelly candies (gummies) suspected of containing muscimol. Results: Derivatization (dansylation) significantly improved the chromatographic behavior of both analytes by reducing polarity and enhancing retention on standard RP columns. Furthermore, this approach facilitated easier extraction, improved ionizability, and markedly increased detection sensitivity compared to underivatized analytes. Conclusion: The developed LC-MS/MS method is highly effective for the toxicological screening of muscimol and ibotenic acid. Its utility was demonstrated not only in clinical diagnostics but also in the analysis of confectionery (gummies) currently marketed in the Czech Republic and Slovakia as "collector's items."

Komerční drogy jako doplněk stravy ?

Čabala R.
Ústav klinické a soudní toxikologie, Všeobecná fakultní nemocnice a 1. Lékařská fakulta Univerzity Karlovy, Praha

Kazuistika Pokusy o komercionalizaci psychoaktivních látek, které nejsou na seznamech zakázaných látek, ale mají vykazovat podobné účinky, není neznámým jevem. Autor byl jako znalec přizván k analýze 6ti vzorků „falešných" drog (amfetamin, hašiš, kokain, kořen, MDMA), kdy měl potvrdit, že vzorky meteriálů plánovaných jistou společností k prodeji jako potravinové doplňky/falešné drogy, neobsahují žádnou ze zakázaných látek. Všechny vzorky byly analyzovány metodou vysokoúčinné kapalinové chromatografie s vysokorozlišující hmotnostní spekrometrií (HPLC-HRMS) a výsledky prokázaly, že majoritní složky vzorků nejsou zakázané látky (např. kofein, některé kanabinoidy), ovšem ve stopách byla prokázána přítomnost i těch zakázaných (např. MDMB-4en-PINACA, THC, hexahydrokanabinol).

Nepřímé hluboké chemické popáleniny vyvolané uhlovodíky po masivním požití xylenu a benzínu v ústech: Unikátní případ bez přímého vystavení kůži

Čabala R.[3], Kafka P.[1], Bakalář B.[1,2],
[1]Department of Anesthesia and Intensive Care Medicine, Third Faculty of Medicine, Charles University and FNKV University Hospital, Prague
[2]Department of Burn Medicine, Third Faculty of Medicine, Charles University and FNKV University Hospital, Prague
[3]Institute of Clinical and Forensic Toxicology, General University Hospital and First Faculty of Medicine, Charles University, Prague

Case study Massive oral ingestion of hydrocarbons is rare and typically associated with severe systemic toxicity, aspiration, and CNS depression. Dermal injury usually follows direct skin exposure. We report an unusual case of deep partial- and full-thickness anogenital chemical burns (8% TBSA) in a patient who ingested 500 mL gasoline and 420 mL xylene/ethylbenzene solvent without direct dermal contact. The patient remained seated for 10–12 hours in urine- and stool-soaked tight underwear, a duration critical for maceration and barrier compromise. Prolonged occlusion, maceration, elevated pH from urinary ammonia, and fecal enzymatic activity caused profound barrier failure, enabling trace hydrocarbons—likely from aerosolized vapors and microdroplets absorbed into moist textiles—to penetrate deeply into compromised skin. Concentration of toluene, xylene and ethylbenzene was determined in urine and serum by headspace gas chromatography. This represents a previously undescribed dermatotoxic mechanism of textile-mediated hydrocarbon injury.

Postmortem Distribution of 2-FMA and 3-FEA, Novel Amphetamine Analogues in a Fatal Poisoning Case

Nižnanský Ľ.[1,2], Nižnanská Ž.[1,2,3], Šikuta J.[1,2], Kuruc R.[1,2]
[1]Institute of Legal Medicine and Medico-Legal Toxicology, Faculty of Medicine, Comenius University, Sasinkova 4, 81108 Bratislava
[2]Department of Forensic Medicine, Health Care Surveillance Authority, Antolská 11, 85107 Bratislava
[3]Department of Analytical Chemistry, Faculty of Natural Sciences, Comenius University Bratislava, Mlynská Dolina, Ilkovičova 6, 84215 Bratislava

Background: Rapidly developing designer drugs known as "new psychoactive substances" (NPS) frequently elude legal oversight and routine drug testing. The presence of NPS is associated with deaths and severe poisoning, as they are much more toxic at lower concentrations than the substances from which they were derived. Aim: Our work describes a case study of fatal poisoning along with a summary of the toxicological profiles of 2-fluoromethamphetamine and 3-fluoroethamphetamine. Materials and Methods: Experimental analysis of autopsy samples was conducted using gas chromatography–mass spectrometry to detect

2-fluoromethamphetamine (2-FMA) and 3-Fluoroethamphetamine (3-FEA), novel amphetamine analogues. Validation of the method was performed. Results: The successful identification and quantification of 2-FMA and 3-FEA in blood, urine, vitreous humor, and cerebrospinal fluid samples in postmortem samples through an optimized analytical process that included sample derivatization confirmed that the victim had ingested these designer stimulants before death. The cause of death was poisoning by these two substances. Conclusion: Such poisoning has not yet been described in the literature. This study expands our knowledge of the threats posed by NPS and highlights the need for improved screening and identification methods.

Analýza hladin amiodaronu u zemřelých

Vlčková A., Novotná Rychtecká A., Kotschwarová J., Marek M., Miškovská K.
Krajská zdravotní a.s., Masarykova nemocnice v Ústí nad Labem o.z.

Prezentován případ úmrtí v důsledku intoxikace amiodaronem a výsledky toxikologických analýz v kontrolním souboru zemřelých, kterým byl v rámci kardiopulmonální resuscitace podán amiodaron.

Session XVII.

The Boundaries of Objectivity: Methodological Errors and Ethical Dilemmas in Forensic Medical Expertise

Kováč P.[1], Moravanský N.[1], Neszméry M.[2], Laciaková L.[3]
[1]Ústav súdneho lekárstva a súdnolekárskej toxikológie LF UK, Bratislava
[2]Súdnolekarske pracovisko UDZS Bratislava
[3]forensic.sk Inštitut forenznych medicinskych expertiz s.r.o.,

Forensic medical expertise serves as a critical pillar of a fair judicial process. Despite high professional standards, forensic practice frequently encounters methodological errors and ethical lapses that can fundamentally compromise legal certainty. This presentation focuses on analyzing the most prevalent shortcomings in expert activities, with a specific emphasis on "non-lege artis" procedures during the formulation of expert opinions. The first part of the presentation analyzes methodological errors resulting from the disregard of standardized protocols, insufficient critical analysis of evidence, or the overstepping of professional boundaries by the expert. Special attention is given to ethical dimensions, including non-cooperation, expert bias, and the "hired gun" phenomenon. We present also case studies concerning the assessment of long-term health consequences in scenarios where relevant medical documentation is absent. Such cases force the expert to navigate the boundary between scientific rigor and hypothetical inference, carrying a significant risk of subjectivity. The objective of this presentation is to underscore the necessity of strict adherence to methodological algorithms and ethical codes as primary safeguards against judicial errors.A significant contribution of this presentation lies in its dual perspective. The authors draw upon their extensive professional experience from both sides of the judicial process—serving not only as forensic medical experts but also as legal counsels representing parties in both civil and criminal proceedings. This multifaceted background allows for a comprehensive analysis of expert failures, bridging the gap between medical methodology and the rigorous demands of legal advocacy. By examining the intersection of these two roles, the presentation provides a unique insight into how expert opinions are constructed, challenged, and perceived within the courtroom.

I felt like death was imminent: Medicolegal implications of non-fatal strangulation

Janík M., Straka Ľ., Hejna P.
Department of Forensic Medicine, Jessenius Faculty of Medicine, Martin

Background: Non-fatal strangulation (NFS) is when strangulation does not cause death. Interpersonal violence, including domestic abuse and sexual assault is commonly associated with NFS. Despite minimal or absent external injuries, NFS can result in significant morbidity and delayed mortality. It is increasingly recognized as a

predictor of future homicide and life-threatening assault. Objective: Summarize the epidemiology, pathophysiology, clinical presentation and medicolegal implications of non-fatal strangulation. Methods: A structured medicolegally oriented review of current guidelines and studies addressing mechanisms of injury, diagnostic approaches, and outcomes associated with NFS. Results: NFS involves external compression of the neck leading to airway obstruction, vascular occlusion (carotid and jugular vessels), and/or neurogenic reflexes. Cerebral hypoxia can occur within seconds, with loss of consciousness reported in up to one-third of cases. Physical findings are frequently subtle; up to 50% of patients may have no visible external injury. Reported symptoms include dysphonia, dysphagia, dyspnea, neck pain, headache, visual disturbances, and neurological deficits. Potential complications include laryngeal injury, vocal cord paralysis, carotid or vertebral artery dissection, stroke, and delayed airway compromise. Documentation of patient history and symptoms is critical for both clinical care and legal proceedings. Conclusions: NFS is a high-risk clinical presentation requiring thorough assessment even in the absence of visible injury. Early recognition, appropriate imaging, safety assessment, and multidisciplinary follow-up are essential to reduce morbidity and prevent future lethal violence.

Forenzní anatomie jazylky

Pažinová J., Hejna P.
Ústav soudního lékařství Fakultní nemocnice Plzeň

Jazylka (os hyoideum) představuje specifickou součást lidské kostry s výraznou variabilitou základních morfotypů, rozměrových parametrů a stupně osifikace chrupavčitých spojení. V soudnělékařské praxi slouží nejen jako vodítko pro odhad věku a pohlaví jedince, ale také jako senzitivní indikátor působícího násilí na oblast krku. Autoři prezentují dosud chybějící systematickou studii, která analyzuje polymorfismus z pohledu tvarových odchylek, rozměrových charakteristik a vývojových či získaných variant jazylky ve vzorku dospělých jedinců české populace.

Forensic Investigation of a Diving Fatality: Scope and Limitations of Underwater Reconstruction

Rybárová V.[1], Novomeský F.[1], Prygl R.[2], Šejba J.[2]
[1]Department of Forensic Medicine and Medicolegal Expertise, Jessenius Faculty of Medicine, Comenius University, University Hospital, Martin
[2]Department of Special Diving Operations and Training, Police of the Czech Republic

Introduction: In diving fatalities, autopsy findings frequently confirm drowning but do not clarify the mechanism leading to loss of control underwater. Establishing the causal sequence is essential in medicolegal practice, particularly when evaluating possible medical conditions, equipment malfunction, third-party involvement, or environmental factors. Underwater forensic reconstruction may serve as a supplementary tool to assess the biomechanical plausibility of proposed mechanisms, although its evidentiary value must be interpreted cautiously. Case: A 32-year-old female diver conducted a night dive in a freshwater dam. During descent to approximately 40 m, the group became separated due to sediment disturbance and poor visibility. The diver entered the dive without a cutting device. Her body was recovered 30 hours later at 28 m in a head-down position, with markedly inflated drysuit legs. A thin guideline was found in a single loop around the twin-cylinder manifold and displaced over the head. Autopsy findings were consistent with drowning, and technical examination revealed no equipment failure. Conclusions: A structured in-water reconstruction was performed under controlled conditions by trained police divers using identical equipment. The reconstruction demonstrated that contact between a tensioned guideline and the manifold could rapidly create stable entanglement, resulting in inversion and severe restriction of movement. In the absence of a cutting device, self-release was significantly limited. Although not all environmental or physiological variables could be reproduced, the reconstruction confirmed the biomechanical plausibility of accidental entrapment as the initiating event. This case illustrates the value of underwater reconstruction when autopsy findings alone do not explain the triggering mechanism of drowning, while emphasizing its limits: reconstruction demonstrates plausibility rather than definitive causation.

Retrospective Analysis of Hypothermia-Related Deaths

Neszméry M.[2], Szórádová A.[1,2], Mikulášová D.[1,2], Šikuta J.[1,2], Kuruc R.[1,2]
[1]Institute of Legal Medicine and Medico-Legal Toxicology, Faculty of Medicine, Comenius University, Sasinkova 4, 81108 Bratislava
[2]Department of Forensic Medicine, Health Care Surveillance Authority, Antolská 11, 85107 Bratislava

Background:Postmortem diagnosis of deaths caused by excessive natural cold exposure represents a diagnostically challenging and etiologically multifactorial group of causes of death in forensic practice, often limited by the low specificity of autopsy findings. Although hypothermia is traditionally considered mainly in relation to the direct effects of cold on the human body, clinical and forensic experience indicates the significant role of accompanying factors such as the effect of ethanol, social vulnerability, and serious comorbidities, which may lead to fatal hypothermia even under relatively mild temperature conditions. Aim: The aim of this study is to provide a retrospective forensic overview of hypothermia-related deaths due to hypothermia and to analyze selected demographic, temporal, environmental, toxicological, and pathological variables in the Bratislava and Trnava regions. Material and Methods: This retrospective observational study is based on the analysis of autopsy documentation of cases in which hypothermia was determined as the immediate cause of death. Evaluated variables included demographic characteristics, temporal and climatic factors, location and circumstances of body discovery, toxicological findings, the presence of selected macroscopic autopsy signs traditionally associated with hypothermia, and relevant comorbidities. Results: The analysis enables assessment of the temporal and seasonal distribution of deaths, age and sex structure of affected individuals, and the contribution of ethanol, other psychoactive substances, and comorbidities as significant potential contributing factors. Attention is also given to the variability in the occurrence of macroscopic autopsy signs associated with hypothermia, highlighting their limited diagnostic specificity and the importance of comprehensive forensic evaluation of the circumstances of death. Conclusion: This study provides a comprehensive regional forensic overview of hypothermia-related deaths and emphasizes the need for a complex forensic approach integrating autopsy findings, toxicological results, and contextual information.

Organ weight reference values in the adult Slovak population: A forensic autopsy study of nearly 3,000 cases

Babiak F.[1], Janík M.[1,2], Straka Ľ.[1,2]
[1]Department of Forensic Medicine and Medicolegal Expertise, Jessenius Faculty of Medicine, Comenius University, University Hospital, Kollárova 10, 036 01, Martin
[2]Forensic and Pathological-Anatomical Unit, Health Care Surveillance Authority, Kuzmányho 27/B, 036 01, Martin

Background: Organ weights represent a fundamental component of medicolegal autopsy evaluation. Deviations from expected organ weights may indicate underlying pathological processes and therefore require reliable and population-specific reference standards. However, many currently used reference tables are derived from older datasets and may not adequately reflect our contemporary population. Aim: To establish updated reference values for adult organ weights based on a large autopsy cohort from Slovakia. Material and Methods: Organ weights were collected from 2,774 carefully evaluated adult autopsies (2,052 men and 722 women) performed at the Department of Forensic Medicine and Medicolegal Expertise, Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava, University Hospital Martin in collaboration with the Health Care Surveillance Authority. Standardized autopsy protocols were applied and major organs routinely assessed in forensic practice were included in the analysis. Results: The cohort represents one of the largest autopsy datasets from the Slovak population. Preliminary analyses indicate sex-related differences in organ weights, with higher absolute organ weights observed in men for most examined organs. Organ weights demonstrate positive associations with body weight for selected organs and age-related trends, especially for brain weight. Comparative evaluation with historically used reference tables suggests potential shifts in median organ weights in our population. Conclusion: This study aims to provide updated organ weight reference data for use in forensic and hospital

autopsy practice in Slovakia. The resulting tables are expected to improve the accuracy of postmortem interpretation and contribute to region-specific forensic standards.

Forensic medicine and anthropology in South Africa: a personal experience

Hanzelyová K., Straka Ľ., Janík M.
Department of Forensic Medicine and Medical Expertises, Jessenius Faculty of Medicine in Martin, Comenius University Bratislava

South Africa presents a highly demanding environment for forensic medicine, characterized by a high rate of violent deaths and the frequent occurrence of gunshot wounds, stab wounds, thermally altered bodies and skeletal remains. Based on an internship completed in Johannesburg, the organizational model of the forensic system is examined, with particular emphasis on the processing of skeletal remains and the role of forensic anthropology within forensic practice. In Johannesburg, skeletal findings are initially subjected to basic assessment at the Department of Forensic Medicine, subsequently cleaned (including maceration), and then transferred to the Department of Anatomical Sciences, where forensic anthropologists conduct detailed osteological analyses and prepare expert reports. This model enables the systematic integration of anthropological expertise into investigations involving fragmented, decomposed or thermally altered remains. In practice, forensic anthropologists in South Africa frequently encounter gunshot trauma to bone, extensive thermal alterations, ante-, peri- and postmortem activity of domestic and wild animals, as well as injuries caused by blunt and sharp force trauma. The Human Variation and Identification Research Unit also plays a significant role in the identification of unknown individuals and the systematic handling of cases requiring a multidisciplinary approach. A comparison of the South African model with current practice in Slovakia highlights differences in organizational support, caseload and the degree of integration of forensic anthropology into the forensic process. Experience gained in the South African setting underscores the importance of structured interdisciplinary cooperation and clearly defined competency frameworks in the management of skeletal and complex forensic cases.

congress
prague

VYŠEHRADSKÁ 430/41
128 00, Praha 2
ČESKÁ REPUBLIKA
E-MAIL: OFFICE@CONGRESSPRAGUE.CZ
WEB: WWW.CONGRESSPRAGUE.CZ