29th International Meeting on Forensic Medicine ALPE-ADRIA -PANNONIA

June 20-22, 2024
Pécs, Hungary

BOOK OF ABSTRACTS

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DEAR COLLEAGUES!

On behalf of the Organizing Committee, it is my distinct pleasure to extend a heartfelt invitation to the 29th International Meeting on Forensic Medicine Alpe – Adria – Pannonia. Join us in Pécs, Hungary, from June 20 to 22, 2024, as we delve into the evolving landscape of Forensic Sciences in the face of 21st-century challenges.

The dawn of the new millennium has ushered in challenges for Forensic Sciences. The imperative for objective, unambiguous scientific evidence calls for the application of novel methods and a critical re-evaluation of existing techniques. The advancements in Forensic Medicine, Forensic Imaging, Forensic Toxicology, and Genetics over the past decade have opened new horizons.

This meeting serves as an invaluable platform to exchange insights and experiences regarding current practices and to explore emerging techniques and ideas that shape the future of our field. Moreover, it is an opportunity to establish the foundations for future research and collaborative endeavours.

While applying new techniques presents challenges, we also acknowledge the persistent issues from the past and present. The meeting promises to be a forum for addressing these challenges collectively and charting a course toward innovative solutions.

Beyond the scientific discourse, the meeting will foster social contacts and friendships, providing a delightful backdrop for networking and camaraderie. The University of Pécs, which recently celebrated its 650th anniversary as the first Hungarian university, welcomes you to this landmark event.

We look forward to your participation and the enriching conversations that will undoubtedly characterize the 29th International Meeting on Forensic Medicine Alpe – Adria – Pannonia.

Yours sincerely,

Gabor Simon
Head of the Organizing Committee
Head of the Department of Forensic Medicine
Medical School, University of Pécs, Hungary

▶ ORGANIZER

University of Pécs, Medical School, Department of Forensic Medicine

▶ ORGANIZING COMMITTEE

Gábor Simon
Chair (head of organizing committee)

Viktor Soma Poór
Vice-chair

Dénes Tóth
Secretary of organizing committee

▶ SCIENTIFIC COMMITTEE

Gabor Simon
Viktor Soma Poór
Dénes Tóth
Zsolt Kozma
Veronika Heckmann
Mónika Kuzma

▶ PATRONS

UNIVERSITY OF PÉCS
MEDICAL SCHOOL

MIOT
Hungarian Society of
Forensic Medical Experts

GENERAL INFORMATION

Website for Further Information
https://www.convention.hu/Events/Details/ADRIA24/Welcomenote

▶ OPENING HOURS FOR REGISTRATION

20 June, Thursday 09:00-17:00
21 June, Friday 08:30-17:00
22 June, Saturday 08:30 – 12:00

▶ CONFERENCE OFFICE

Regarding exhibition and sponsorship:
Mrs. Renáta Horvát
Phone: +36 30 721 3713
E-mail: rhorvat@convention.hu

Regarding registration:
Klaudia Tamás
Phone: +36 30 488 4663
E-mail: ktamas@convention.hu

Convention Budapest Ltd.
Besnyői str. 13, H-1143 Budapest, Hungary
Fax: + 36 1 299 0187

www.convention.hu

▶ REGISTATION FEE:

	By applying before March 1, 2024	With application after March 1, 2024
Specialist:	EUR 200	EUR 250
Resident:	EUR 170	EUR 200
Student:	EUR 150	EUR 170
3D Printing in Forensic Medicine Workshop:	EUR 20	EUR 20
BANQUET DINNER		
Friday evening	EUR 60	EUR 60

Discount for Members of Hungarian Society of Forensic Medical Experts: 20 Euro

REGISTRATION FEE INCLUDES: Admission to main congress, exhibition and poster area. Congress bag with all materials incl. programme book, abstract book. Admission to Welcome reception, Coffee breaks and lunches during main congress days

▶ ACCOMODATION:

Corso Hotel Pécs (Koller u. 8, Pécs, Hungary,H- 7626)

Standard room single occupancy	EUR 96 /room /night
Standard room double occupancy	EUR 110 /room /night
Superior room single occupancy	EUR 104 /room /night
Superior room double occupancy	EUR 117 /room /night

ADDRESS

▶ CONGRESS VENUE

University of Pécs, Medical School,
Grastyán Endre theoretical building - 7624 Pécs, Szigeti str 12.

▶ GALA DINNER

TREZOR - 7621 Pécs, Király str. 11.

Welcome reception (included in registration fee) will also take place at the Grastyán Endre theoretical building. 7624 Pécs, Szigeti út 12.

Workshop will take place in the Department of Forensic Medicine, 7624 Pécs Szigeti str. 12 (meeting for participants is at the congress venue).

▶ INFORMATION

At the registration desk every staff member will be glad to help you with any enquiries.

▶ OFFICIAL LANGUAGE

English. No simultaneous translation will be provided.

▶ CERTIFICATE OF ATTENDANCE

A Certificate of Attendance will be issued at the time of registration to delegates who are pre-registered.

▶ LUNCHES

The registration fee does include lunch and catering services.

▶ INSURANCE

Registration fees do not include insurance. It is strongly recommended that at the time you register for the Meeting and book your travel you take out an insurance policy of your choice.

The Meeting Hosts and Meeting Managers have arranged for photography onsite throughout the event. The images may be used for post-Meeting reports. If you do not wish for your photo to be taken, please inform the photographer and move out of camera range.

GENERAL INFORMATION – HUNGARY

- Country Dialing Code: +36
- Emergency Services: Dial 112 for police, fire department, and medical services
- Currency: Hungarian Forint (HUF). Note: Euro is widely accepted in many places
- Payment Options: Credit card payments accepted in most restaurants, shops, hotels, and ATMs
- Time Zone: Central European Time (CET), UTC +1
- Electricity: 230 volts, 50 Hz, plug types C and F
- Drinking Water: Tap water is safe to drink across Hungary
- Tipping: Customary to tip about 10% in restaurants and taxis
- Smoking Regulations: Smoking is strictly prohibited in public places, including government buildings, public transportation, and indoors at dining venues unless designated smoking areas are available.

TRANSPORTATION – TAXI SERVICE

Several TAXI service providers are available, including Bolt and Volán Taxi Pécs with english language mobile apps.

VOLÁN TAXI - GOOGLE PLAY STORE

VOLÁN TAXI – APPLE APP STORE

BOLT TAXI

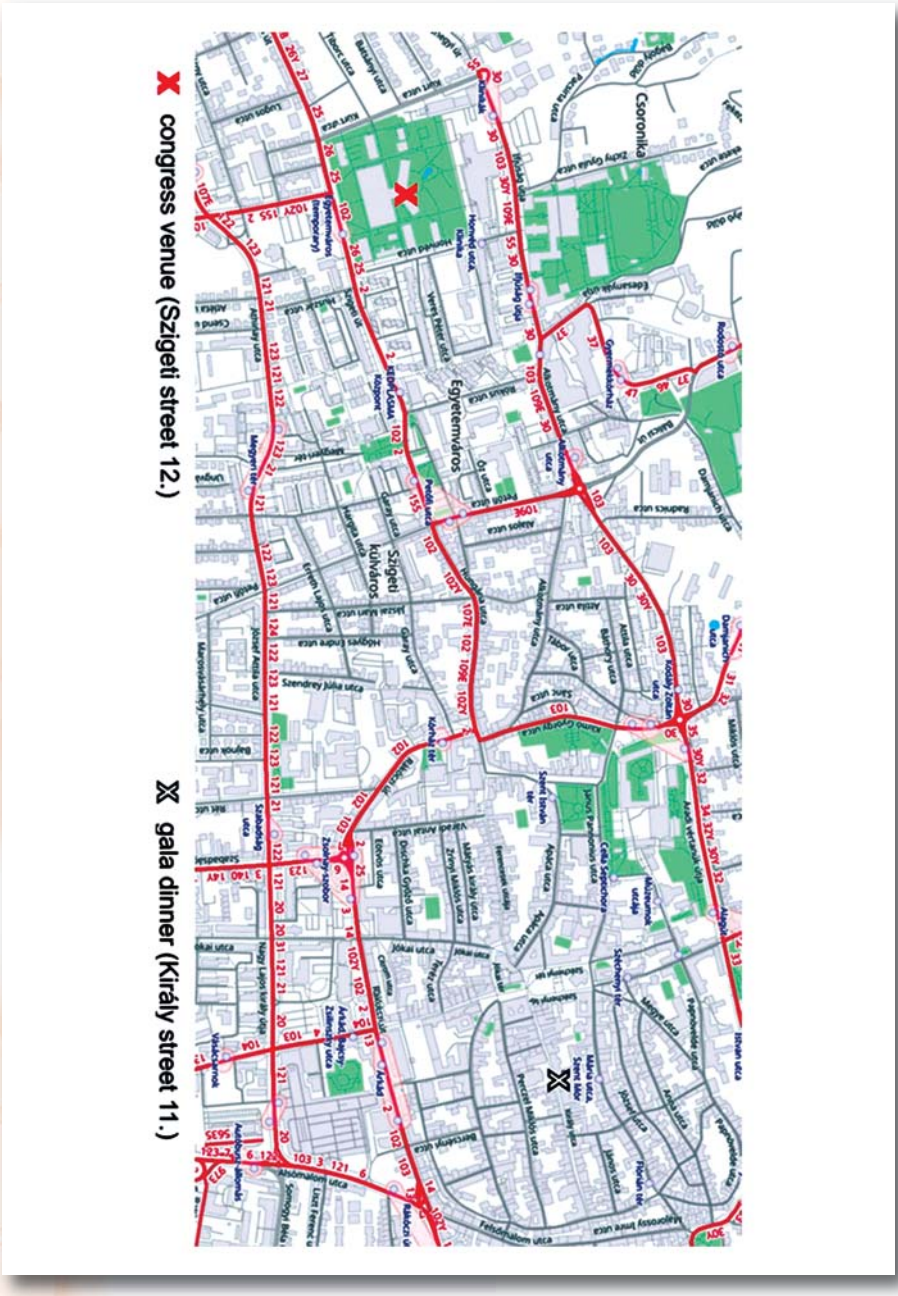
▶PUBLIC TRANSPORTATION

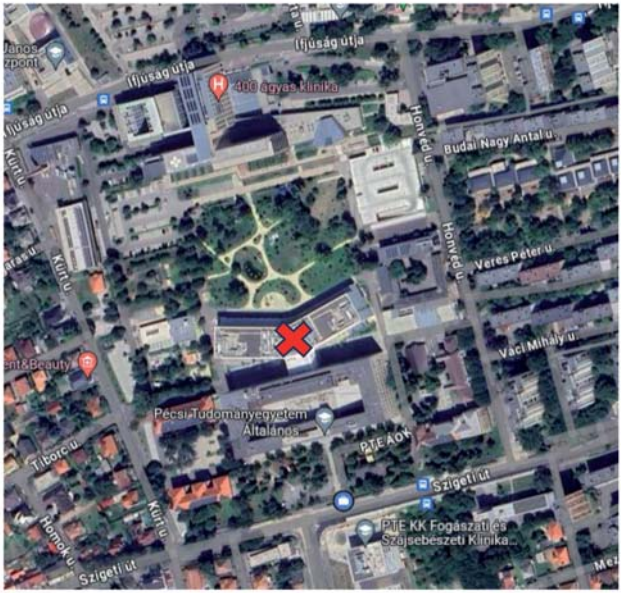
Public transportation consists of local buses operated by Tükebusz. An advance-purchase ticket (line ticket) is valid for a single trip and can be purchased at the company's ticket offices, designated stores within the reseller network, bus stations from traffic service personnel (except at Budai Bus Station), and electronically as a mobile ticket. It is also possible to buy a ticket directly from the bus driver (in this case, only cash payment is accepted). The price of a pre-purchased line ticket and a line ticket bought through the mobile application is 400 HUF. A ticket purchased from the bus driver costs 500 HUF. Electronic mobile tickets are available in the following applications:

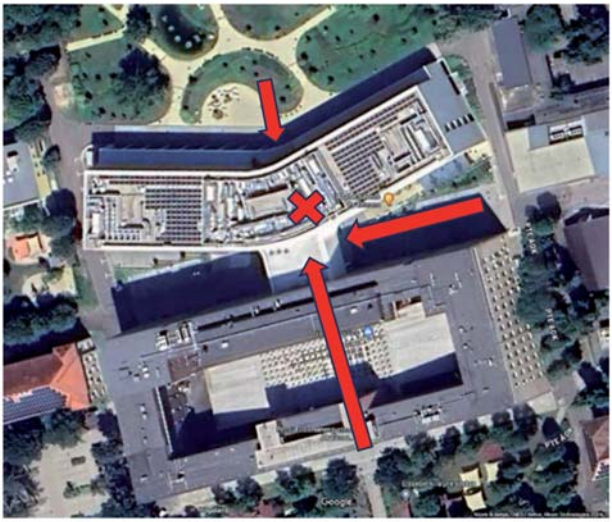
Közlekedési Mobiljegy
Google Play Store
For Android devices running
Android 5.0 or higher versions.

Közlekedési Mobiljegy
Apple App Store
For iPhone devices running
iOS 10 or higher versions.

For planning travel within the city by bus,
we recommend using Google Maps.
The bus company's website can be accessed at:
https://mobilitas.biokom.hu/en/home


congress venue (Szigeti street 12.)
gala dinner (Király street 11.)
Egyetemváros
Szigeti külváros
Csoronika



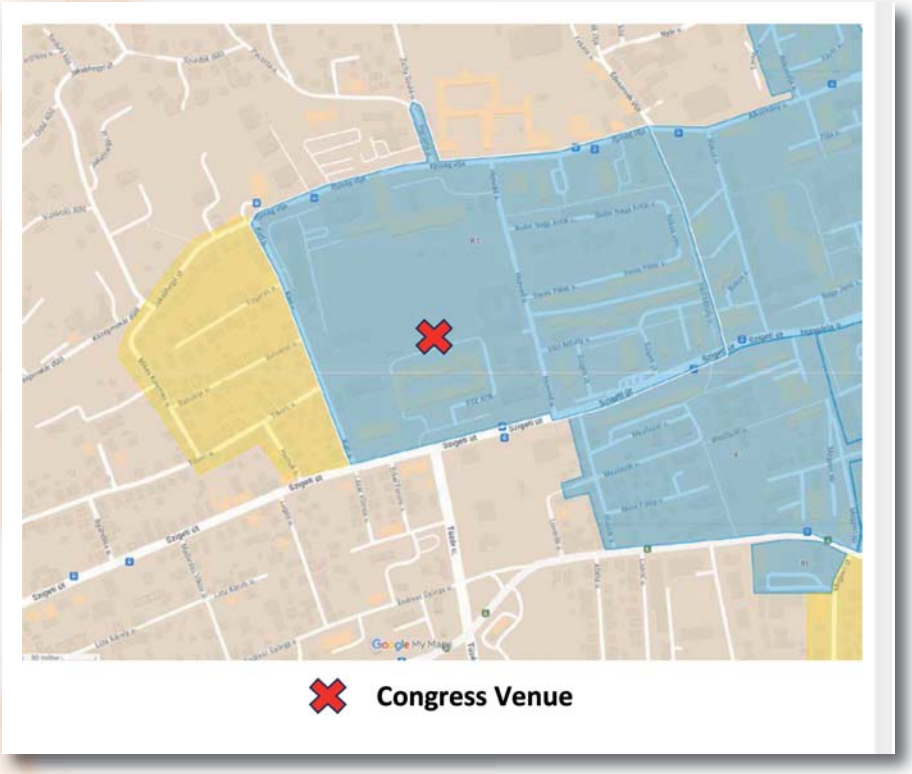


Congress Venue

entrances marked with red arrows

PARKING

- Parking within the University of Pécs is allowed only for the employees.
- Parking fee is 200 Ft/hour in the zones marked with blue colour between 08:00 and 17:00. There is no parking fee on Saturday.
- Parking is limited in time in area marked with yellow (maximum parking time is 120 minutes).
- There is no parking fee or limitation in the unmarked areas.



Guidelines for speakers

1. Please deliver the presentation to the technician at least 15 minutes before the start of the session.

2. Presentation should be delivered on USB. Using your own notebook or tablet is not allowed.

3. Presentation format: Microsoft PowerPoint or PDF document format. Videos should be included in your PowerPoint.

4. We would like to ask the speakers to keep their presentations within the given time limits (maximum of 12 minutes presentation + 3 minutes debate).

Guidelines for posters

1. Posters will be displayed at the congress venue.

2. The poster should be printed, with dimension between 80-100 cm (width), and 120-150 cm (length).

3. Printing service is not available at the venue.

4. The posters should be placed on their designated place (see poster number) at latest in the lunch break before the poster is presented.

5. The posters should be presented shortly for the scientific committee in the two poster sections.

AWARDS

The following awards will be presented in the closing ceremony.

▶AWARDED BY THE SCIENTIFIC COMMITEE:

Best oral presentation
Best oral presentation for presenters below the age of 35
Best poster presentation

▶AUDIENCE AWARDS

(awarded after electronic voting of registered participants)

Best oral presentation - audience award
Best poster - audience award

29th International Meeting on Forensic Medicine ALPE-ADRIA-PANNONIA

June 20-22, 2024
Pécs, Hungary

SCIENTIFIC PROGRAM

20 June, 2024

09:30-10:00 **Opening ceremony**
Representatives of University of Pécs
Gábor Simon, Head of the organizing commitee

10:00-11:00 **Special Session with Invited Speakers**
Chairs: *Silke Grabherr,* Switzerland and *Gábor Simon,* Hungary

10:00 – 10:30 **The organizations and practice of forensic medicine in Hungary**
Péter Gergely
University of Debrecen, Department of Forensic Medicine, Debrecen, Hungary

10:30 – 11:00 **Death in Custody.**
Prof. Jason Payne-James
Norfolk & Norwich University Hospital, Norwich, UK
William Harvey Research Institute, Queen Mary University of London, UK
Forensic Healthcare Services Ltd, Southminster, UK

11:00 – 11:15 **COFFEE BREAK**

11:15-12:45 **SPECIAL SESSION WITH INVITED SPEAKERS**
Chairs: *Jason Payne-James,* United Kingdom and *Péter Gergely,* Hungary

11:15 – 11:45 **Forensic Imaging: current practice and future developments.**
Prof. Silke Grabherr
University Center of Legal Medicine Lausanne-Geneva, Switzerland

11:45 – 12:15 **Graduate and postgraduate teaching and training in forensic medicine.**
Roland Weiczner
University of Szeged, Department of Forensic Medicine, Szeged, Hungary

12:15 – 12:45 **The challenges of the humanitarian approach on the issue of missing persons: example of Kosovo.**
Ditor Haliti
Institute of Forensic Medicine; Faculty of Medicine - University of Prishtina; Prishtina, Republic of Kosovo

12:45 – 13:45 **LUNCH TIME**

13:15 – 15:00 **WORKSHOP**
instructor: *Viktor Soma Poór*

13:45 – 15:00 **FREE COMMUNICATIONS (I)**
Chairs: *Stefan Pollak*, Germany and *Ditor Haliti*, Kosovo

13:45 – 14:00 **Valuable medical profession: some facts in the field of forensic medicine in Hungary**
Zsolt Kozma[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

14:00 – 14:15 **Hypothermia-induced suicide in the context of Amyotrophic Lateral Sclerosis: A case study**
Martin Mervic[1], *Tomaž Zupanc*[1], *Antun Ferenčić*[1]
[1] Institute of Forensic Medicine, Faculty of Medicine, University of Ljubljana, Slovenia

14:15 – 14:30 **Analysis of drowning-related cases by detecting aquatic microorganisms with microscopic and molecular approach, and risk factor exploration over a 5-year period (2018-2022) in Hungary**
Dominika Szűcs[1], *Vivien Fejes*[1], *Viktor Soma Poór*[1], *Gábor Simon*[1], *Katalin Sipos*[1,2]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, Faculty of Pharmacy, Department of Pharmaceutical Biology, Pécs, Hungary

14:30 – 14:45 **Forensic examination of the injuries found on the remains in mass grave no. Iii. in Mohács, Hungary – a recommendation of useful methods**

Tímea Mai[1], György Pálfi[2], Viktor Vig[2], Zsolt Berecki[2], Árpád Szabó[1]
[1] University of Szeged, Department of Forensic Medicine, Szeged, Hungary
[2] University of Szeged, Department of Anthropology, Szeged, Hungary

14:45 – 15:00 **The effect of the presence and severity of atherosclerosis in traumatic injuries Of the thoracic aorta**

Dénes Pauka[1], Gábor Simon[1], Veronika Heckmann[1], Dénes Tóth[1], Viktor Soma Poór[1], Roland Told[2], Péter Maróti[2]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, 3D Printing&Visualization Centre, Pécs, Hungary

15:00– 15:15 **COFFEE BREAK**

15:15 – 16:45 **FREE COMMUNICATIONS (II)**
Chairs: *Éva Sija*, Hungary and *Mónika Kuzma*, Hungary

15:15 – 15:30 **A Lidocaine-related forensic dilemma clarified via a pilot study**

Zsófia Mrekváné Burián[1], Mátyás Mayer[1,2], Gábor Simon [1]
[1] University of Pécs Medical Schiool, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, Clinical Centre, Department of Laboratory Medicine, Pécs, Hungary

15:30 – 15:45 **The possibilities and forensic value of oral tissue examinations**

Gábor András Czupy[1], Antal Kricskovics [1]
[1] Hungarian Institute for Forensic Sciences - Department of Forensic Medicine, Budapest, Hungary

15:45 – 16:00 **Emerging old psychoactive agent of far east in europe: kratom**

Ágnes Lakatos[1], Anikó Lajtai [1], Dávid Hesszenberger [1], Dávid Csabai[1], Mátyás Mayer[1,2], Mónika Kuzma [2]
[1] University of Pécs, Clinical Centre, Department of Laboratory Medicine, Pécs, Hungary
[2] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

16:00 – 16:15 **Fatal cocaine-induced hyperthermia: a case report**

Domenico Nieddu[1], Alberto Chighine[1], Matteo Nioi[1]
[1] Forensic Medicine Unit, Department of Clinical Sciences and Public Health, University of Cagliari, Cagliari, Italy

16:15 – 16:30 **Evaluation of the symptoms in case of driving under the influence of drugs**

Péter Nagy Varjas [1], Viktor Soma Poór[1], Dénes Tóth[1], Mátyás Mayer[1,2], Mónika Kuzma[1], Gábor Simon[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, Clinical Centre, Department of Laboratory Medicine, Pécs, Hungary

16:30– 16:45 **COFFEE BREAK**

16:45 – 17:45 **POSTER SESSION (I)**
Chairs: **Silke Grabherr**, Germany and **Dénes Tóth**, **Viktor Soma Poór**, Hungary

Posters P01 – P16

18:30 **WELCOME RECEPTION**

21 June, 2024

09:00 – 10:30 **SPECIAL SESSION WITH INVITED SPEAKERS**
Chairs: *Zsolt Kozma,* Hungary and *Jason Payne-James,* United Kingdom

09:00 – 09:30 **The possibilities of the multidisciplinary approach in the investigation of non-natural deaths – Case Studies**
Antal Kricskovics

09:30 – 10:00 **Deconstruction of a double murder. Body language & misinterpretation**
Prof. Tamás F. Molnár

10:00 – 10:30 **How insects can help to estimate the minimal PMI**
Dominik Javorski

10:30 – 10:45 **COFFEE BREAK**

10:45 – 12:15 **FREE COMMUNICATIONS (III)**
Chairs: *Michael Tsokos,* Germany and *Roland Weiczner,* Hungary

10:45 – 11:00 **Suicides by crossbow**
Jozef Šidlo[1,2], Peter Očko[2], Adriana Gavronová[3], Ľubomír Mikuláš[2], Lukáš Hamerlik[3]
[1] Institute of Forensic Medicine, Faculty of Medicine, Comenius University in Bratislava, Bratislava, Slovakia
[2] Department of Forensic Medicine, Health Care Surveillance Authority, Bratislava, Slovakia
[3] Institute of Forensic Medicine and Medical Law, University Hospital, Faculty of Medicine, Palacký University in Olomouc, Olomouc, Czech Republic

11:00 – 11:15 **Adult female sudden death by massive bleeding from pulmonary anomalous small vessels**
Francesco D'elia[1], Lorenzo Desinan[2], Francesco Simonit [2], Ugo Da Broi[2]
[1] Postgraduate School of Legal Medicine, University of Trieste, Trieste, Italy
[2] Department of Medicine / Legal Medicine, University of Udine, Udine, Italy

11:15 – 11:30 **Forensic assessment of air gun injuries**

Gábor Simon[1], Karola Petrus[1], Furkan Yaşlıoğlu[1], Viktor Soma Poór[1], Emil Hamza[2], Norbert Szabián[2], Gábor Kovács[3]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

[2] Civilian Small Arms and Ammunition Examiner Ltd. – The Hungarian C.I.P. Proof House, Budapest, Hungary

[3] Széchényi István University, Department of Criminal Sciences, Győr, Hungary

11:30 – 11:45 **Analysis techniques of soft tissue injury descriptions in Hungarian clinical records and forensic medical autopsy reports**

Gábor Gyenes[1], Gábor Simon [2], Zoltán Patonai[3], Katalin Fogarasi[1]

[1] Semmelweis University, Institute of Languages for Specific Purposes, Budapest, Hungary

[2] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

[3] University of Pécs, Clinical Centre, Department of Traumatology and Hand Surgery, Pécs, Hungary

11:45 – 12:00 **Crafting clarity and elevating the narrative of pediatric medical reports in Hungary through precision and standardization**

Viktória Sirokmány[1], Katalin Fogarasi[1], Tamás Kassai[2], Gábor Gyenes[1], Zoltán Patonai[3]

[1] Institute of Languages for Specific Purposes, Semmelweis University, Budapest, Hungary

[2] Dr. Manninger Jenő Trauma Center, Budapest, Hungary

[3] Department of Traumatology and Hand Surgery, University of Pécs, Clinical Center, Pécs, Hungary

12:00 – 12:15 **Omega-shaped epiglottis in infancy**

Beáta Havasi[1], Gábor Papp[1], Roland Weiczner[1]

University of Szeged, Department of Forensic Medicine, Szeged, Hungary

12:15 – 13:15 **LUNCH TIME**

13:15- 14:45 **SPECIAL SESSION WITH INVITED SPEAKERS**
Chairs: *Dénes Tóth*, Hungary and *Péter Gergely*, Hungary

13:15 – 13:45 **Uncommon gunshot injuries exemplified by case material and supplemented by experimental studies**
Prof. Stefan Pollak
Albert- Ludwigs-Universität Freiburg, Department of Forensic Medicine, Freiburg, Germany

13:45 – 14:15 **Clinical guidelines for the diagnosis of (physical) child abuse**
Prof. Michael Tsokos
State institute of Forensic Medicine, Berlin, Germany

14:15 – 14:45 **Crime scene documentation, reconstruction and visualization at the 3D Center Zurich**
Lars Christian Ebert
Forensisches Institut Zürich, Zürich, Switzerland

14:45 – 15:00 **COFFEE BREAK**

15:00 – 16:45 **FREE COMMUNICATIONS (IV)**
Chairs: *Lars Christian Ebert*, Switzerland and *Silke Grabherr*, Switzerland

15:15 – 15:30 **Fit for purpose. Enhancing forensic documentation in emergency care through AI-driven technology**
Zoltan Lantos[1], Katalin Fogarasi[2], Zoltán Patonai[3]
[1] Semmelweis University, Department of Virtual Health Guide Methodology
[2] Semmelweis University, Institute of Languages for Specific Purposes;
[3] University of Pécs, Clinical Centre, Department of Traumatology and Hand Surgery

15:30 – 15:45 **Injury pattern analysis with supervised learning algorithm in deaths due to blunt force trauma**
Panna Jámbor-Hegedüs[1], János Bokor[1]
[1] Semmelweis University, Institute of Pathology, Forensic and Insurance Medicine, Budapest, Hungary

15:45 – 16:00 **Machine-learning algorithm in Sars-Cov-2 postmortem infection cases in the institute of Forensic Medicine in Timisoara, Romania**

Raluca Dumache[1], Marina-Adriana Mercioni[2], Camelia-Oana Muresan[1], Emanuela Stan[1], Alexandra Enache[1]
[1] Victor Babes University of Medicine and Pharmacy, Timisoara, Romania
[2] Polytehnica University, Timisoara, Romania

16:00 – 16:15 **Forensic aspects of the digitized medical data and telemedicine – Hungarian experience**

Éva M. Kereszty[1]
[1] University of Szeged, Department of Forensic Medicine, Szeged, Hungary

16:15 – 16:30 **Forensic Pathology in the age of artificial intelligence: exploring the potential of large language models**

Dóra Horváth,[1], Gábor Simon[1], Viktor Soma Poór[1], Dénes Tóth[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

16:30 – 16:45 **Educational frontiers: exploring innovative methods in teaching forensic medicine to undergraduates**

Dénes Tóth[1], Gábor Simon[1], Veronika Heckmann[1], Dénes Pauka[1], Karola Petrus[1], Zsófia Mrekváné Burián[1], Vivien Fejes[1], Viktor Soma Poór[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

16:45 – 17:00 **COFFEE BREAK**

17:00 – 18:00 **POSTER SESSION (II)**
Chairs: *Michael Tsokos*, Germany
and *Gábor Simon*, *Viktor Soma Poór*, Hungary

Posters P17 – P32

20:00 - **GALA DINNER**

09:00-10:30 **FREE COMMUNICATIONS (V)**
Chairs: *Stefan Pollak*, Germany
and *Roland Weiczner*, Hungary

09:00 – 09:15 **Injuries caused by plasma lighters**
Gabriella Nagy[1], Karola Petrus[1], Kitti Sági[1], Dénes Pauka[1], Evelin Biczó[1], Gábor Simon[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

09:15 – 09:30 **Case study on expert opinions in Germany**
Gábor Gyenes[1], Blanka Tatár[2], Zoltán Patonai[3], Tanja Germerott[4], Katalin Fogarasi[1]
[1] Semmelweis University, Institute of Languages for Specific Purposes, Budapest, Hungary
[2] North-Buda St. John's Medical Center, Department of Radiology, Budapest, Hungary
[3] University of Pécs, Clinical Centre, Department of Traumatology and Hand Surgery, Pécs, Hungary
[4] University of Mainz, Institute of Forensic Medicine, Mainz, Germany

09:30 – 09:45 **Mechanical characteristics of liver according to histological appearance**
Katinka Veres[1], Karola Petrus[1], Soma Poór Viktor[1], Gábor Simon[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

09:45 – 10:00 **Fatality from firework-induced trauma: a case report**
Antun Ferenčić[1], Tomaž Zupanc[1], Martin Mervic[1]
[1] Institute of Forensic Medicine, Ljubljana, Slovenia

10:00 – 10:15 **Death by acute myocardial infarction after whiplash injury: natural versus posttraumatic death**
Tena Sadlo[1], Elizabeta Matuzalem Marinović[1], Boris Dumenčić,[1], Ines Šunjić[2], Darija Alpeza[1], Luka Klobučarić[1]
[1] University Hosital Centre Osijek, Osijek, Croatia
[2] University Clinical Hospital, Mostar, Bosnia and Herzegovina

10:15 – 10:30 **Determination of the post-mortem interval by assessing the viability of chondrocytes in the knee joint of pigs under winter conditions**

Marko Cvetko[1], Armin Alibegović[2], Mitja Gombač[1]
[1] Veterinary Faculty, Institute for Pathology, Wild Animals, Fish and Bees, University of Ljubljana, Ljubljana, Slovenia
[2] Faculty of Medicine, Institute of Forensic Medicine, University of Ljubljana, Ljubljana, Slovenia

10:30 – 10:45 **COFFEE BREAK**

10:45 - 12:15 **FREE COMMUNICATIONS (IV)**
Chairs: *Ditor Haliti*, Kosovo and *Gábor Simon*, Hungary

10:45 – 11:00 **Evaluation of the effect of ozone disinfection on forensic presumptive and confirmatory tests of blood, saliva, and semen stains**

Vivien Fejes[1], Gábor Simon[1], Katalin Sipos[1,2], Viktor Soma Poór[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, Faculty of Pharmacy, Department of Pharmaceutical Biology, Pécs, Hungary

11:00 – 11:15 **Morphology of the sequelae of increased intracranial pressure**

Natasha Davcheva[1,2,3]
[1] Institute of forensic medicine, Faculty of medicine UKIM Skopje, Skopje, Macedonia
[2] Faculty of medical sciences UGD Shtip, Shtip, Macedonia
[3] Faculty of medicine, University of Maribor, Maribor, Slovenia

11:15 -11:30 **Sternal aspiration as a method of sampling or diatom test**

Viktor Soma Poór[1], Dominika Szűcs[1], Vivien Fejes[1]
[1] University of Pécs, Medichal School, Department of Forensic Medicine, Pécs, Hungary

11:30 – 11:45 **Forensic Toxicological aspects of legally distributed cannabidiol products**

Mátyás Mayer[1,2], Viktória Varga[1], Mónika Kuzma[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine,
[2] University of Pécs, Clinical Centre, Department of Laboratory Medicine

11:45 – 12:00 **Hungarian medical reports of injuries: evaluating terminological and medical consistency in traumatology**

Zoltán Patonai[1], Attila Gátos[1], Katalin Fogarasi[2]
[1] University of Pécs, Clinical Centre, Department of Traumatology and Hand Surgery, Pécs, Hungary
[2] Institute of Languages for Specific Purposes, Semmelweis University, Budapest, Hungary

12:00 – 12:15 **HIV/AIDS, Human rights and medical law - a review from Sri Lankan perspectives**

Saratchandra Kodiakra[1]
[1] Department of Forensic Medicine, Faculty of Medicine, University of Peradeniya, Peradeniya, Sri Lanka

12:15 -13:00 **CLOSING CEREMONY**

13:00 – 15:00 **CULTURAL PROGRAM IN PÉCS**

29th International Meeting on Forensic Medicine ALPE-ADRIA-PANNONIA

June 20-22, 2024

Pécs, Hungary

ABSTRACTS

FREE COMMUNICATIONS (I)

Valuable medical profession: some facts in the field of Forensic Medicine in Hungary

Zsolt Kozma[1]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

In my presentation, I will describe the current structure of the Hungarian forensic medicine, as profession, the levels of the existing regulatory professional boards and the functions of these, as well as the characteristics of the professional training program before the specialized exam and the system of the obligatory continuous professional training in forensic medicine.

I will also present the milestones of the last 10 years of those scientific and educational work at the Institute for Forensic Medicine of Pécs University Medical School, which contributed to the fact that this one of the smallest medical profession which provides medical specialization, could be represented by an independent institute at university level within this rural medical university.

Hypothermia-induced suicide in the context of Amyotrophic Lateral Sclerosis: a case study

Martin Mervic[1], Tomaž Zupanc[1], Antun Ferenčić[1]

[1] Institute of Forensic Medicine, Faculty of Medicine, University of Ljubljana, Slovenia

Hypothermia, a condition resulting from prolonged exposure to cold temperatures, remains a significant threat to lives globally, particularly in regions characterized by extreme cold. This presentation presents a case study documenting a 75-year-old woman's hypothermia-induced suicide subsequent to an Amyotrophic Lateral Sclerosis (ALS) diagnosis shortly before her death. While most hypothermia-related deaths are accidental, suicides among individuals with ALS represent a rare and tragic phenomenon. ALS patients, facing progressive paralysis and declining physical function, may opt to end their lives to escape suffering and loss of autonomy linked with the disease. Research indicates that ALS patients face an elevated risk of suicidal tendencies compared to the general population, particularly within the initial months post-diagnosis. Major Depressive Disorder (MDD) emerges as a prevalent mental health concern among ALS patients, often exacerbating susceptibility to suicidal ideation and behavior. The presented case highlights the imperative for public health initiatives, routine mental health screenings, and early intervention in ALS treatment to mitigate these risks. Understanding the complex interplay between hypothermia, ALS, and suicidal tendencies underscores the necessity for comprehensive support systems and tailored interventions for vulnerable populations facing debilitating diseases.

Analysis of drowning-related cases by detecting aquatic microorganisms with microscopic and molecular approach, and risk factor exploration over a 5-year period (2018-2022) in Hungary

Dominika Szűcs[1], **Vivien Fejes**[1], **Viktor Soma Poór**[1], **Gábor Simon**[1], **Katalin Sipos**[1,2]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, Faculty of Pharmacy, Department of Pharmaceutical Biology, Pécs, Hungary

We have investigated drowning cases form 14 counties of Hungary in a five-year period between 2018 and 2022, a total of 233 drowning cases. One aim of the study was to explore prevalent risk factors associated with drowning incidents, including age, sex, seasonal variations, and environmental variables. Aquatic microorganisms can be valuable indicators of drowning due to their ability to enter the bloodstream and the organs of the systemic circulation post-submersion. We also investigated the combined application of diatom tests and polymerase chain reaction (PCR) methods.

Male victims outnumbered female victims by more than three times. The age groups of 51 to 70 years had the highest number of drowning fatalities for both sexes. As for seasonal variations, summer accounted for the highest number of drowning casualties. Drowning incidents took place across diverse water environments, with the majority of bodies recovered from rivers and lakes.

Based on the diatom test, only 58 out of all the examined samples yielded positive results in any of the analysed systemic organs. However, when the negative cases were supplemented with the PCR method, the number of positive results increased to 146, indicating a 2.5-fold increment. This research shedding light on critical aspect of risk factors linked to drowning incident and highlighting the effectiveness of combining two diagnostic techniques to help determine the cause of death as drowning.

Forensic examination of the injuries found on the remains in mass grave no. Iii. in Mohács, Hungary – a recommendation of useful methods

Tímea Mai[1], György Pálfi[2], Viktor Vig [2], Zsolt Berecki[2], Árpád Szabó[1]

[1]University of Szeged, Department of Forensic Medicine, Szeged, Hungary
[2]University of Szeged, Department of Anthropology, Szeged, Hungary

The battle of Mohács in 1526 between the Christian army and the advancing Turkish forces is one of the most important milestones in Hungarian history, which sealed the fate of our country for the next 150 years. The exact location and the circumstances of the battle are still a matter of debate among historians and other experts. Historians, archeologists, anthropologists and forensic medical experts are working together to answer some of the arising questions for the upcoming 500th anniversary. There were high hopes to obtain important information from the excavation of the mass graves linked to the battle. To this day, only one of the five known mass graves has been excavated, containing the remains of about 350 individuals, which took us more than 3 years due to the arrangement of the remains on top of each other and to the work being done with extra caution due to their fragility. By helping on the excavation site we had a chance to compare the sharp force inflicted skull and cervical spine injuries observed on site with those observed after the washing and reassembling of the skeletons. The majority of the analysing work is yet to be done, therefore we present the conclusions regarding the methodology drawn from our preliminary results. We highlight the importance of careful and precise documentation of the injuries using notes and photos. We provide an overview of the imaging techniques that can be used for different purposes regarding the evaluation of the bone injuries. Cone-beam CT can be used to obtain high-resolution direct three-dimensional images proved to be particurarly useful in the examination of fragmentary bones, which are embedded in the soil and contain arrowheads, projectiles or other weapon fragments. The scanned images allow virtual reconstruction of the fragmentary bones or even whole skulls. For even more detailed analysis regarding the direction of the injuries, macro photography proved to be the most useful method.

The effect of the presence and severity of atherosclerosis in traumatic injuries of the thoracic aorta

Dénes Pauka[1], Gábor Simon[1], Veronika Heckmann[1], Dénes Tóth[1], Viktor Soma Poór[1], Roland Told[2], Péter Maróti[2]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, 3D Printing&Visualization Centre, Pécs, Hungary

Besides the multiple external factors, the most important internal factor in the development of thoracic aorta injuries (TAI) in traffic accidents and falling from heights is atherosclerosis, the most common disease affecting the aorta. Our research aimed to examine the effect of atherosclerosis on the vulnerability and tensile strength of the thoracic aorta.
One hundred four human aorta samples from 52 pathological and forensic pathological autopsy cases were used for our research. 2 dog-bone-shaped samples were removed from each body – one from the area between the intercostal arteries and one from the left intercostal artery. The severity of atherosclerosis in the samples was determined both macroscopically and microscopically. The thickness of the aorta samples was measured by a motorized force tester (MecMesin MultiTest dV-AFG-500). Tensile tests were executed with a biaxial tester (Zwick/Roell zwickiLine Z5.0TN), in which we measured the maximal force (Fmax), the elongation at the time of Fmax (Emax), the force at the beginning of the rupture (Fbreak), and the elongation at the time of Fbreak (Ebreak).
There was no significant difference between the sample groups A and B (between and beside the origins of intercostal arteries). The decrease of all measured values was detected by the increasing severity of atherosclerosis in the aorta samples.
The presence and the increasing severity of atherosclerosis decreases the longitudinal resistance of the aorta. Thus a smaller force is sufficient for the rupture, especially if severe (calcified) atherosclerosis is present. The results suggest that atherosclerosis should be considered upon forensic evaluation of TAI.

A lidocaine-related forensic dilemma clarified via a pilot study

Zsófia Mrekváné Burián[1], Mátyás Mayer[1,2], Gábor Simon [1]

[1] University of Pécs Medical Schiool, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, Clinical Centre, Department of Laboratory Medicine, Pécs, Hungary

An 89-year-old unconscious man was admitted to the hospital with severe hypotension and tachycardia. Cranial CT revealed a chronic subdural hematoma requiring neurosurgery, however, surgical intervention was cancelled due to his critical condition. Despite the administered vasopressor treatment, the patient died 10 hours after admission. The medico-legal autopsy revealed no anatomical cause of death; among others, acute on chronic subdural hematoma confirmed with histological examination, encephalomalacia in the left basal ganglia, left temporal lobe and right frontal lobe, dilated atria and ventricles, and a bilateral hydrothorax.
Toxicological examination identified 16 588 ng/mL lidocaine concentration in the blood sample and 86 ng/mL lidocaine concentration in the urine sample. DNA analysis confirmed that both the blood and the urine sample originated from the same person. Thus, as no lidocaine administration was registered in the medical documents, a crime was suspected, and the police was contacted. After further investigation, there was no sign of a crime. Thorough questioning revealed that a central venous catheter was inserted into the right femoral vein shortly before his death. According to our theory, the above lidocaine concentration could have resulted from the post mortem redistribution of the local high lidocaine concentration in the tissues after local anaesthesia, however, we found no data in the literature supporting it.
We performed a study with six cases: after gaining a negative blood sample, 3 mL of 1% lidocaine solution was administered at 1 cm from the femoral vein. Further 5-5 samples were obtained from both sides after one, two, four, eight and twenty-four hours, respectively. The results will be demonstrated at the presentation.

The possibilities and forensic value of oral tissue examinations

Gábor András Czupy[1], Antal Kricskovics [1]

[1] Hungarian Institute for Forensic Sciences - Department of Forensic Medicine, Budapest, Hungary

This presentation explores the information provided by the macro- and microscopic examination of oral cavity tissues that could contribute significantly to the identification of unknown bodies and estimation of the post-mortal interval (PMI). Currently, oral examination shows low importance in routine field investigations of the dead, but is expected to become an effective method to answer these important questions in the future. Due to their location, tissues located in the oral cavity are less exposed to environmental influences and may remain suitable for examination for a longer period of time - by varying degrees individually - compared to soft tissues of the external body surface and/or those exposed to microbes. This could lead to new, practical methods in PMI estimation, while additionally these tissues may also retain their unique properties useful in identification. The hard palate and teeth are the two most significant formations of the oral cavity. The hard palate is more resistant to decay than other soft tissues – e.g. free mucosa, skin - due to the presence of bone and hard connective tissue layer, therefore it maintains its appearance (ridges) over time, while parts of the dental crown, dentin and enamel - the hardest tissues in the human body - are protecting the pulp, making it even less exposed to environmental influences and more resistant to decay.

Currently, the most widely used identification method involving oral cavity tissues is based on the dental status. In Hungary, this procedure is difficult to use for several reasons (e.g. significant proportion of missing upper and lower teeth, partial or complete failure to record and store dental status during dental care). The spread of 3D oral scanners in dental practice creates the possibility of easy and rapid imaging of the hard palate. This 3D information could be used in personal identification (so-called rugoscopy). Otherwise, the ability of the DNA to be preserved in the dental pulp for long-term analysis should also be emphasized, providing a new type of sample that can be easily analyzed and retrieved over time, comparably to bone.

Tissues of oral cavity offer a new way of estimating PMI, primarily through histological examination and determination of the extent of DNA degradation. The soft tissues of the hard palate and the pulp may be suitable for histological sampling, which has also the advantage of being easy to perform (e.g. punch biopsy).

In the presentation we collected the currently used methods in forensic medicine for personal identification and estimation of PMI. We summarised the current role of oral cavity tissues in routine field investigations and the relevant researches. We would emphasize a limitation, that generally, research carried out in this topic have been conducted under experimental conditions, so the results would be difficult to apply routinely in practice. We would also highlight the potential for future research directions and practical applications within this area.

Emerging old psychoactive agent of far east in Europe: Kratom

Ágnes Lakatos[1], Anikó Lajtai [1], Dávid Hesszenberger [1], Dávid Csabai[1], Mátyás Mayer[1,2], Mónika Kuzma [2]

[1] University of Pécs, Clinical Centre, Department of Laboratory Medicine, Pécs, Hungary
[2] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

Over the past decade, it has become regular to find more and more synthetic addictive drugs in emergency clinical or forensic samples. Recently, as a novelty, in several cases the peaks of mitragynine and its metabolites appeared on the chromatogram of the serum or urine sample of patients. Mitragynine is an alkaloid of the kratom (Mitragyna speciosa) tree. This evergreen plant, similar to the coffee shrub (Rubiaceae), is native to the Far East: Indonesia, Malaysia, Thailand. In these regions, kratom leaves have been used for centuries chewing as stimulating agent (in smaller doses) and tea brewed from dried leaves for its analgesic, euphoric and narcotic effects (in higher doses). It appeared in USA and Europe only a couple of decades ago. Dried, powdered leaves are sold in alternative shops. Mitragynine binds μ-opioid receptors, as selective agonist. It is addictive, but the effect is not as dramatic as heroin. It can be used instead of opiates or to help in withdrawal. Kratom in some countries is banned, in Hungary not illegal.
In our laboratory Mitragynine and its derivatives were detected in late 2020 in a patient sample from the emergency department. We could identify them both in serum and urine with our Shimadzu TOXIS.II HPLC-DAD device. Since then, there have been several cases.
Mitragynine concentrations were between 0,05 μg/ml and 1 μg/ml in serum samples. An even wider concentration range was observed in urine samples. In some cases, we could detect only the alkaloids of kratom, in others they occurred together with other agents.
In clinical laboratory toxicology practice, we often find substances in biological samples we have no experience with, so it is necessary to acquire new information and standards. We do not know how often an unexpected result will be repeated.

Fatal cocaine-induced hyperthermia: a case report

Domenico Nieddu[1], Alberto Chighine[1], Matteo Nioi[1]

[1] Forensic Medicine Unit, Department of Clinical Sciences and Public Health, University of Cagliari, Cagliari, Italy

Cocaine-induced hyperthermia is a rare but well-documented event in medical literature. The condition, often associated with delirium and agitation, is thought to have a pathogenic mechanism similar to the one of neuroleptic malignant syndrome. In those cases where circumstantial data are unknown, finding such a body can pose challenges in estimating the postmortem interval and determining the cause of death.

Methods and Results:

In this study, we describe the case of a 35-year-old man in a state of psychomotor agitation for whom emergency services were called. Medical personnel described him as agitated and mentally altered, speaking nonsense. Due to his agitated state, police assistance was required to restrain and treat him, but he suddenly died during the intervention. A forensic examination was ordered due to suspicion of death due to police misconduct. On his arrival, the forensic doctor noted some bruises on the victim's arms and scratches on his lower limbs. The temperature recorded on the scene by the forensic doctor was 42°C (107.6°F). An autopsy revealed hardened brain tissue (resembling a boiled egg) and softened heart tissue. Histological examination showed signs of acute cardiac failure (edematous and heavier lungs) without other significant macroscopic alterations. Toxicological analysis revealed ethanol (1.31 g/L), cocaine (176 ng/ml), and benzoylecgonine (328 ng/ml) in the blood.

Although cocaine-induced hyperthermia is a recognized phenomenon, there are no studies that definitively describe its epidemiology and incidence. The hypothesized etiopathogenesis involves a blockade at various levels of the dopaminergic system with an inhibitory effect on the nigrostriatal system, explaining muscle rigidity, and effects on the hypothalamic area affecting thermoregulation. Alternative hypotheses include involvement of other neurotransmitters such as GABA, as well as calcium, endorphins, and prostaglandins. Similar phenomena occur in neuroleptic malignant syndrome, which typically shows hyperthermia (50-60% of cases with temperatures above 38°C or 100.4°F), significant extrapyramidal signs with severe muscle rigidity, autonomic nervous system impairment (hypotension, hypertension, tachycardia, hyperhidrosis, incontinence), altered

consciousness (agitation, confusion, delirium, stupor, and coma), and respiratory disorders. A sudden and inexplicable worsening of the individual's psychopathological condition, even in the presence of initial symptoms, should raise suspicion of this alteration. Understanding this phenomenon is crucial for forensic pathologists in several respects. Primarily, in the absence of circumstantial data, alternative methods to body temperature measurement are essential for estimating the time of death, especially when the investigation occurs immediately after death and the body presents with elevated temperature. Furthermore, in cases of hyperthermia with no additional data, a toxicological evaluation is crucial to achieve an accurate differential diagnosis. If positive for cocaine, the estimated time of death should also consider the presence of this phenomenon.

Evaluation of the symptoms in case of driving under the influence of drugs

Péter Nagy Varjas [1], Viktor Soma Poór[1], Dénes Tóth[1], Mátyás Mayer[1,2], Mónika Kuzma[1], Gábor Simon[1]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, Clinical Centre, Department of Laboratory Medicine, Pécs, Hungary

Abuse of psychoactive substances is an important risk factor behind traffic accidents. Therefore, the forensic evaluation of driving under the influence is highly important as it greatly influences the punishment of drivers and also has preventive relevance. The forensic evaluation of driving under the influence of alcohol is well established. However, the assessment of driving under the influence of drugs (DUID) is much more challenging, and there are also significant differences by country. The legal approaches to assessing DUID involve impairment, impairment per se and zero tolerance.
In the case of the impairment approach, the recorded symptoms are evaluated by the forensic expert. However, there is no clear evidence about their reliability while assessing impairment.
We examined the connection between symptoms and blood concentrations of different substances in DUID cases of our department. The results of our study could not highlight any statistical connection between the symptoms and substance concentrations, suggesting that symptoms recorded by the physicians at sampling can not be used as a reliable indicator of impairment.

Suicides by crossbow

Jozed Šidlo[1,2], Peter Očko[2], Adriana Gavronová[3], Ľubomír Mikuláš[2], Lukáš Hamerlik[3]

[1] Institute of Forensic Medicine, Faculty of Medicine, Comenius University in Bratislava, Bratislava, Slovakia
[2] Department of Forensic Medicine, Health Care Surveillance Authority, Bratislava, Slovakia
[3] Institute of Forensic Medicine and Medical Law, University Hospital, Faculty of Medicine, Palacký University in Olomouc, Olomouc, Czech Republic

Traumatic injury due to crossbows is a rare occurrence these days. Fatal injuries occur even more rarely. A small part of them is caused accidentally, but crossbows are also used as a homicide agent, less frequently as a suicide tool. The target areas of the body involved are most often the head and chest but cases of affecting the throat, abdomen, or combined chest and abdominal injuries were also described.
The aim of this work is to present the study of two cases of fatal injuries caused by a bolt shot from a crossbow in suicidal intent.
Case No. 1. It was a 38-year-old man, who suffered shot through the chest during a phone call with his ex-girlfriend. During the autopsy, a shot through the heart and left lung with bleeding into the pericardium and pleural cavity was found. The shooting channel was directed from the front to the back, very slightly from the right to the left, and very slightly from up to down. The immediate cause of death was a haemorrhagic shock. Man was under the influence of ethanol in the stage of tipsiness. Scars from a previous suicide attempt were found in the area of the left forearm.
Case No. 2. It was a 52-year-old man, who was found dead by his ex-girlfriend. During the autopsy, an arrow shot was found in the head entered through the chin area. The shooting channel was directed from down to up, from the front to the back, very slightly from the right to the left. The immediate cause of death was contusion and swelling of the brain. The man was under the influence of ethanol in the stage of severe drunkenness. Scars from a previous suicide attempt were found in the area of the left forearm.

The presented study is interesting from several points of view. The use of a mechanical shoot arm – a crossbow – as a wounding tool against man is nowadays very rare, although, in many countries, mechanical guns are relatively readily available compared to firearms, since the only restriction on their sale is only the age of a person under 18 years. A bolt shot from a crossbow, perhaps surprisingly, has a significant penetration, often exceeding that of firearms.

In both cases, anamnestic and morphological signs of previous suicide attempts were found in the men. In both cases, the suicide was preceded by a breakup with a girlfriend. A rarity of the first case is that the use of crossbow and death occurred "live" during a telephone conversation between the man and his ex-girlfriend who heard a click and swish, i.e., directly a shot from a crossbow.

Due to the growing number of fatal cases caused by a mechanical firearm – crossbow – by attacking by another person, but also by self-harm, it would be necessary to consider restricting access to these weapons, which in many countries are freely for sale even to persons without a gun licence.

Adult female sudden death by massive bleeding from pulmonary anomalous small vessels

Francesco D'elia[1], *Lorenzo Desinan*[2], Francesco Simonit [2], Ugo Da Broi[2]

[1] Postgraduate School of Legal Medicine, University of Trieste, Trieste, Italy
[2] Department of Medicine / Legal Medicine, University of Udine, Udine, Italy

Sudden death due to massive bleeding from pulmonary vascular malformations is an extremely rare event. In the case we present, a 53-year-old woman with no known diseases other than a history of headache, was found dead by her partner with blood oozing out of the oral cavity. She did not report any symptoms in the previous hours. Emergency doctors, who performed CPR, aspirated large amounts of blood from the airways. Autopsy showed no evidence of traumatic injuries. The most significant findings concerned the respiratory tract: trachea and bronchi were filled with blood, both lungs were increased in weight (right = 900 g, left = 1000 g), volume and consistency, with copious blood leakage from the dissection surfaces. The blood content was maximum in the parenchyma of the superior lobe of the left lung, less in the lower lobe of the same lung, but it was also present below the hilum of the right lung.
Leaflets of the tricuspid valve resulted to be thickened and affected by myxoid degeneration. All other organs were normal.
At histological examination extensive pulmonary haemorrhage was observed. In particular, a large number of small-caliber vessels, partially grouped in small clusters, were identified in the left upper pulmonary lobe, whereas lung parenchyma was characterized by massive haemorrhagic alveolar infiltration, in absence of inflammatory infiltrates.
The aspect of the anomalous vessels was likely to that of venules with very thickened walls, partly jagged and collapsed. Specific staining revealed the presence of a minimal amount of elastin (Elastika van Gieson - EvG), and a remarkable quantity of collagen (Masson's trichrome).

Forensic assessment of air gun injuries

Gábor Simon[1], Karola Petrus[1], Furkan Yaşlıoğlu[1], Viktor Soma Poór[1], Emil Hamza[2], Norbert Szabián[2], Gábor Kovács[3]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] Civilian Small Arms and Ammunition Examiner Ltd. – The Hungarian C.I.P. Proof House, Budapest, Hungary
[3] Széchényi István University, Department of Criminal Sciences, Győr, Hungary

Air guns are considered mostly harmless by public opinion, and air gun injuries are – especially considering the large number of air gun injuries - also underrated in Forensics. Compared with firearm injuries, there is only relatively scarce scientific data available about the penetration capabilities of air gun pellets and pellet injury patterns; thus, forensic evaluation of air gun-related injuries can be challenging.
Three cases are presented to illustrate the difficulties of assessing air-gun-related injuries. Also, experimental results of the examination of penetration capabilities of air gun projectiles are presented and discussed. The results indicate that air guns, even with a muzzle energy well below 7.5 J muzzle energy can cause several centimeter-deep penetrations; thus, even these weapons can be potentially fatal.

Analysis techniques of soft tissue injury descriptions in Hungarian clinical records and forensic medical autopsy reports

Gábor Gyenes[1], Gábor Simon [2], Zoltán Patonai[3], Katalin Fogarasi[1]

[1] Semmelweis University, Institute of Languages for Specific Purposes, Budapest, Hungary
[2] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[3] University of Pécs, Clinical Centre, Department of Traumatology and Hand Surgery, Pécs, Hungary

Research indicates that clinical medical injury descriptions (MDRIs) often lack sufficient detail, hindering forensic evaluations in a substantial portion of cases. Forensic autopsy reports offer comprehensive external injury descriptions but are not feasible within clinical settings due to constraints in time and resources. To analyse these documents, the identification of appropriate techniques is necessary. This study aims to compare soft tissue injury descriptions in Hungarian clinical records and forensic medical autopsy reports to identify optimal analysis standards. Data comprising 244 autopsy reports and 244 MDRIs were collected, and injury descriptions and characteristics were extracted for analysis using the IBM SPSS Statistics 22 software, categorized by underlying injury mechanisms. Results reveal that forensic autopsy reports consistently include a higher number of injuries not necessitating treatment, with descriptions generally longer than those in MDRIs using the appropriate analysis techniques. Furthermore, forensic reports provide more extensive descriptions of injuries, including those not requiring medical intervention. The study focuses on common soft tissue injuries documented in both forensic and clinical reports and underscores the frequent lack of detailed information in clinical records, potentially impacting legal proceedings. The findings are expected to provide relevant analysis methods for injury descriptions, thereby improving medical linguistic research and educational efforts aimed at enhancing clinicians' ability to provide comprehensive injury descriptions.

Crafting clarity and elevating the narrative of pediatric medical reports in Hungary through precision and standardization

Viktória Sirokmány[1], Katalin Fogarasi[1], Tamás Kassai[2], Gábor Gyenes[1], Zoltán Patonai[3]

[1] Institute of Languages for Specific Purposes, Semmelweis University, Budapest, Hungary
[2] Dr. Manninger Jenő Trauma Center, Budapest, Hungary
[3] Department of Traumatology and Hand Surgery, University of Pécs, Clinical Center, Pécs, Hungary

Our comprehensive analysis across three studies emphasizes the importance of detailed medical documentation in discerning accidental injuries and child abuse. It also sheds light on the prevalent reliance on the International Classification of Diseases (ICD), known locally as Betegségek Nemzetközi Osztályozása (BNO), categories. This synthesis explores the terminological precision, legal frameworks, diagnostic classification, and documentation practices supporting the identification and management of child injuries. Our comprehensive aim is to enhance the terminological accuracy of medical reports, thereby facilitating a more refined differentiation between accidents and abuse scenarios, which is critical for both clinical management and legal decision-making.

Employing a manual contrastive analysis alongside a statistical evaluation of medical reports from two trauma centers in Hungary, we thoroughly examined the terminological consistency between Hungarian and Latin diagnoses. This methodological approach was augmented by an in-depth review of existing literature on child abuse* and forensic medicine** in Hungary, aiming to identify terminological inconsistencies that could potentially obscure the clinical and legal interpretation of child injuries. Hungarian and international guidelines regarding the documentation of child injuries were also mapped up in a manual analysis.

Our findings highlight discrepancies in documentation practices, particularly emphasizing a low rate of correspondence (29%) between Latin and Hungarian diagnoses in medical reports of child injuries. The analysis reveals a significant gap in the documentation of soft tissue and bone injuries, with essential details such as size, shape, color, and age of injuries frequently omitted. Moreover, the prevalent use of BNO categories, often lacking individualized detail, was found to compromise the adequacy of medical reports in forensic assessments and legal proceedings. A lack of guidelines

on the description of child injuries was also found alongside terminological inconsistencies in literature on child abuse* and forensic medicine**. The analysis highlights the damaging impact of overgeneralized terms and reliance on BNO categories, underscoring the necessity for detailed, individualized medical reports. Such reports are the key to a comprehensive clinical understanding and are vital in legal contexts, especially in cases where child injuries might result from abuse. The discussion advocates for the development of standardized guidelines for documenting pediatric injuries, aimed at supporting differential diagnostics and facilitating the determination of abuse cases.

Our studies underscore the necessity of systemic changes in Hungary's pediatric injury documentation, suggesting clear guidelines for detailed injury descriptions and consistent diagnoses across Latin and Hungarian. This initiative is crucial for bolstering clinical and legal practices, ultimately protecting child welfare. We propose comprehensive training for healthcare workers in documenting injuries and adopting standardized terminology to address current shortcomings. Such improvements are essential for ensuring medical records accurately support both the clinical treatment and legal investigation of child injuries.

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Omega-shaped epiglottis in infancy

Beáta Havasi[1], Gábor Papp[1], Roland Weiczner[1]

[1] University of Szeged, Department of Forensic Medicine, Szeged, Hungary

Laryngomalacia is the most common cause of stridor in infancy. Omega-shaped epiglottis is one of the presenting forms of laryngomalacia. Inspirational stridor is the main disease manifestation which is usually self limited and resolves in the first 12 to 18 months of life. One theory of aethiology is the reduction in support from the cartilaginous framework. The inspiratory stridor worsens with restlessness or crying, and improves during sleep. Direct laryngoscony is the gold standard examination to diagnose stridor.

We present two cases of infants with omega-epiglottis, where surgical intervention was not indicated on the basis of clinical examination and clinical symptoms.

One infant, previously diagnosed with omega epiglottis, suffered a fatal intracranial haemorrhage due to his father's violent shaking when choking followed feeding. In another case the postmortem of an infant with known laringomalacia died after feeding while sleeping next to the her mother revealed probable asphyxia. Histological examination of the epiglottis failed to demonstrate weakness of cartilaginous structures.

These two cases call for increased consideration of indication of surgical management and close monitoring of laryngomalacia.

FREE COMMUNICATIONS (IV)

Fit for purpose. enhancing forensic documentation in emergeny care through AI-driven technology

Zoltan Lantos[1], Katalin Fogarasi[2], Zoltán Patonai[3]

[1] Semmelweis University, Department of Virtual Health Guide Methodology
[2] Semmelweis University, Institute of Languages for Specific Purposes;
[3] University of Pécs, Clinical Centre, Department of Traumatology and Hand Surgery

The intersection of clinical and forensic medicine presents unique challenges in the documentation of injuries resulting from accidents or assaults. This project introduces an innovative application system combining hardware and software components designed to streamline and standardise the injury documentation process across multiple medical disciplines.

Utilising a terminological data relation, the system standardises surgical-traumatological and forensic medical terminology, drawing from experimental data collection and classification efforts across Hungary and Germany. The application's modular architecture integrates hardware and software elements, facilitating optimal reliability, availability, and maintenance. A central unit manages the system, connecting to external devices (computers, tablets, smartphones) via wired or wireless connections. The system employs open-source proxy (Nginx) and web server (Apache) software for efficient data handling and load balancing, supported by a MariaDB server for robust data management on a Linux-based operating system.

Results: The project delivers a user-friendly documentation platform that automates and guides the injury documentation process. It supports the clear, automated input of injury location and characteristics, and offers decision support for pathology definition and treatment duration. This ensures time-efficient, rapid, and accurate documentation, reducing inconsistencies and enhancing the quality of both clinical and forensic documentation. The system's security features and process designs reinforce the storage and use of reliable health data, allowing for simultaneous editing and modification of medical records in a controlled environment.

By aligning forensic and clinical medical documentation practices through advanced AI and technological integration, this project provides a groundbreaking solution to the complexities of injury documentation. The system not only improves the efficiency and accuracy of medical documentation for healthcare professionals but also ensures the reliability and forensic suitability of the recorded data, paving the way for advancements in the intersection of healthcare and legal proceedings.

Injury pattern analysis with supervised learning algorithm in deaths due to blunt force trauma

Panna Jámbor-Hegedüs[1], János Bokor[1]

[1] Semmelweis University, Institute of Pathology, Forensic and Insurance Medicine, Budapest, Hungary

How various injuries were inflicted? Differentiating between self-inflicted and non-self-inflicted injuries or deciding between an accident or foul play is an everyday task for a forensic medical expert. According to textbooks, the decision is made by examining morphological features and the location of different injuries.

We previously demonstrated that analyzing sharp force injury patterns using a basic supervised learning algorithm, decision trees. As a result, cases were categorized to suicide and homicide with a high reliability (84,50%, 6,87% SD). The predictive value of the injury location and different morphological features to suicide or homicide were evaluated using logistic regression and then the branches of the decision tree were build based on these findings. However, when we examine injuries caused by blunt force, we have to examine a great variety of injuries (bruises, rupture wound, fractures etc.) and sometimes their causality is harder to establish. Therefore, we investigate whether similar algorithms (such as the decision tree) could aid decision making during injury pattern analysis and they may help differentiate between accidental deaths and foul play.

We examined cases from our institutional database between 1998 and 2018. We found 5064 cases in total fulfilling our data selection criteria (4594 accident, 392 homicide and 77 undetermined cases). Then, we categorized every blunt force injury of each case based on their location, whether they show any signs of healing and the magnitude of blunt force. Fat embolism and alcohol influence, toxicological results were taken into account as well. Next, by using logistic regression, we would like to find the most predictive injury features indicating either accident or homicide. Then, we would build a decision tree to measure the reliability of this supervised learning algorithm in decision making.

Our preliminary results suggest that with the increase of injury count, it is more likely that the case will fall into the "undetermined" or "homicide" category.

Overall, by using simple probability modeling and supervised learning algorithms, we hope that they can aid decision making and shed light on a new perspective when it comes to injury pattern analysis. Although computational modeling of injury pattern analysis can not substitute forensic expertise, it can be a useful tool during the decision-making process.
In the future, we would like to investigate the possible use of other alogrithms, such as K-mean clustering and principal component analysis.

Machine-learning algorithm in Sars-Cov-2 postmortem infection cases in the institute of Forensic Medicine in Timisoara, Romania

Raluca Dumache[1], Marina-Adriana Mercioni[2], Camelia-Oana Muresan[1], Emanuela Stan[1], Alexandra Enache[1]

[1] Victor Babes University of Medicine and Pharmacy, Timisoara, Romania
[2] Polytehnica University, Timisoara, Romania

COVID-19 has been considered an imminent risk to human life for the past two years. The COVID-19 virus has been responsible for more than 460 million confirmed illnesses and 6 million deaths globally. A Machine Learning (ML) study was conducted among 240 unexpected death cases within 2020-2023. All death cases were autopsied at the Institute of Forensics in Timisoara, Romania. The association between various parameters and the COVID-19 death rate was extracted using various machine-learning models provided in this work. A statistical analysis and more machine learning approaches were used in this study to evaluate the influence of crucial causative factors that have a major impact on death rates.

The data is disparate (192 negative cases and 57 positive cases), and the Independent Samples T-Test revealed that tracheal secretion and age had strong statistical significance ($p<0.05$). In machine learning, the best results were obtained using a scaled approach.

The results show that the models can be used to forecast the death cases for the future in a virus pandemic case, quickly highlighting the main factors that contributed to a higher risk to lead to death and clarifying the unexpected death cases.

Forensic aspects of the digitized medical data and telemedicine – Hungarian experience

Éva M. Kereszty[1]

[1] University of Szeged, Department of Forensic Medicine, Szeged, Hungary

The computer based medical documentation goes back to the first half of the nineties. The local softwires and local nets of the health providers were gradually replaced by the web-based programs, communicating with each other.

The present governmental program is the 'Digital Hungary', in which a uniform software (Medsolution) is introduced at the health providers and the 'National eHealth Infrastructure' (EESZT) uses cloud-based technologies connecting public and private healthcare providers, pharmacies and the population in the whole area of Hungary.

The patients' access to their health documentation, referrals, prescriptions is easier than it was, but numerous questions raised by the system, which is compulsory also for the non-public providers. Parallely to the advantages we see also problems with the systems.

The forensic expert needs the health data of the deceased when performing the autopsy, when analyzing the malpractice cases, or examining the patient and his medical history for disability allowances. Health professionals are entitled to use only that Medsolution database, which runs at their provider, they can't get information from the Medsolution of another provider, even if they referred the patient to each other. That also may happen in telemedicine, when the diagnosing physician is not entitled to get detailed information on the case. In the majority of health providers only the staff of the ward may see the psychiatry or gynecology data.

The first problem of the above-mentioned systems is that they are incomplete. On one hand, there are numerous non-digital medical documents, e.g. the follow-up materials of the nurses (general condition, liquid balance, etc.) and the special paper-based results of the monitoring equipment, ECG, or others. It is needed more steps to copy or scan these materials to have a digitalized material. On the other hand, the system is often overwhelmed, slow, the login is broken, so despite of the obligation providers or medical professionals avoid using it.

The second problem the patients' order in the eHealth Infrastructure. This makes the system invalid. The patient may object to 'open access' of the health providers to his data, even though they are the treating doctors. This veto may cover only some of the medical fields, like psychiatry or obstetrics, but may cover all data. The searching physician does not have an alert on the fact of objection. When emergency occurs, there is an emergency code to break the system, which can be a point of discussion.
The third problem is the patient's and professionals' access to the data. Those being in the worst health status are generally old and frequently poor. They don't have that kind of web-access on cellular phones or computers, which is needed, or they are not that internet generation practiced in the use this application, and helping persons must get the password or having an individual authorization to by the pharmaceuticals for the patient. The eDeath Certificate is also problematic, while even neither the co-expert at the autopsy nor the police or the health authority are not entitled to see the Death certificate.

Forensic pathology in the age of artificial intelligence: exploring the potential of large language models

Dóra Horváth,[1], Gábor Simon[1], Viktor Soma Poór[1], Dénes Tóth[1]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

Artificial intelligence (AI) involves an interdisciplinary approach that merges computer science and linguistics to create computer systems capable of executing tasks typically requiring human intelligence. Large language models (LLMs), a specialized application of deep learning in natural language processing, have recently attracted significant interest from industry and academic sectors. There has been a wave of AI-powered products built around these LLMs. A growing body of literature explores the integration of LLMs in medicine, spanning clinical, research, and educational domains. There is a lack of literature in forensic pathology regarding the utilization or evaluation of LLMs. For testing purposes, we aimed to assess the efficacy of different LLMs through various forensic pathology scenarios. However, the study did not address the precise determination of the time of death or incorporate image analysis. Throughout our analysis, we assessed the precision of responses to our inquiries and evaluated the validity of the logical reasoning provided. LLMs excelled in straightforward cases that relied on textbook knowledge, where intricate forensic medical reasoning was unnecessary. However, their performance notably declined in cases necessitating complex medico-legal analysis and contextual understanding.

Educational frontiers: exploring innovative methods in teaching Forensic Medicine to undergraduates

Dénes Tóth[1], Gábor Simon[1], Veronika Heckmann[1], Dénes Pauka[1], Karola Petrus[1], Zsófia Mrekváné Burián[1], Vivien Fejes[1], Viktor Soma Poór[1]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

University of Pécs Medical School (UPMS) offers comprehensive, modern forensic medicine education across all university levels. Our undergraduate curriculum covers forensic pathology, clinical forensic medicine, toxicology, genetics, and criminalistics. We emphasize the practical application of theoretical concepts through real-case examples in seminars. Practical sessions include training in wound description, recognizing injury patterns, postmortem examinations, participating in forensic autopsies, and clinical forensic evaluations. A paradigm shift occurred in our educational approach following the implementation of UPMS's strategic plan, PotePillars, transitioning from a teaching-focused to a learning-focused paradigm. Implementation comprised pedagogical courses and skill enhancement workshops for educators, alongside the adoption of innovative teaching methodologies like in-class polling, flipped classrooms, and game- and case-based learning. Additionally, it encompassed the creation and integration of digital/virtual resources and the incorporation of 3D printing technologies. This work presents initial findings in this process. We introduce a 3D photogrammetry method, integrating digital histopathology and postmortem radiology for virtual examinations and injury models. Interactive 3D models are applicable in augmented reality. Additionally, we utilize 3D printing for bone and injury models and gamification techniques for enhanced theoretical seminar engagement.

Injuries caused by plasma lighters

Gabriella Nagy[1], Karola Petrus[1], Kitti Sági[1], Dénes Pauka[1], Evelin Biczó[1], Gábor Simon[1]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

Plasma lighters are flameless electric devices that generate a plasma arc: a high-voltage electrical current passes between two nodes to create an arc of highly charged plasma. Plasma lighters were introduced in 2020 and spread very fast. These are reliable devices to light a fire: easy to use, need only electrical charging and cause no charring.

Plasma lighters are tools that are also capable of creating injuries. However, injuries caused by these lighters have yet to be published in the current scientific literature.

We report a case of a 12-year-old boy's injuries allegedly caused by a plasma lighter. The possible injury appearance is experimentally demonstrated.

Case study on expert opinions in Germany

Gábor Gyenes[1], Blanka Tatár[2], Zoltán Patonai[3], Tanja Germerott[4], Katalin Fogarasi[1]

[1] Semmelweis University, Institute of Languages for Specific Purposes, Budapest, Hungary
[2] North-Buda St. John's Medical Center, Department of Radiology, Budapest, Hungary
[3] University of Pécs, Clinical Centre, Department of Traumatology and Hand Surgery, Pécs, Hungary
[4] University of Mainz, Institute of Forensic Medicine, Mainz, Germany

Clinical and forensic documentation of injuries do not follow the same standards; therefore, difficulties may occur when assessing clinical findings for criminal legal purposes. This study presents the results of a comprehensive case study conducted in Germany, focusing on injury documentation created by clinicians and forensic experts at a Forensic Ambulance. Data from 2018-2019 included 213 forensic reports, revealing a predominant occurrence of soft tissue injuries, out of which 73 cited clinical documents contributing to a total of 464 injuries described in clinical documentation. The forensic reports based on physical examinations at the Forensic Ambulance included 2317 injuries. In clinical documentation, a significant association was revealed between injury mechanism and the documentation of specific injury characteristics, particularly in cases of sharp force injuries and blunt force trauma. Furthermore, the interpretability of the number of injuries (e.g. "numerous" or an exact number) was found to be linked with the mechanism of injury, indicating a higher likelihood of precise documentation for fractures compared to injuries recorded by generalized terms such as bruises. Forensic documentation emphasized characteristics per injury at a higher rate than clinical documentation. Reporting the direction of injuries was different in clinical and forensic documentation, with forensic analysis more frequently noting direction for abrasions and scratches. Agreement between clinical and forensic documentation was most common in injuries localized to the torso. Some characteristics were mentioned more often at specific injury types, colour was mentioned most frequently for describing hematomas and size was mentioned most often for describing swellings. Additionally, limitations in assessability were identified for skin continuity disruptions due to treatment. This study underscores the importance of detailed documentation and highlights discrepancies and association between clinical and forensic injury descriptions, providing valuable source of information for forensic experts and clinicians.

Mechanical characteristics of liver according to histological appearance

Katinka Veres[1], Karola Petrus[1], Soma Poór Viktor[1], Gábor Simon[1]
[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

Liver is the most frequently injured abdomanal organ; and it is an organ also affected commonly by diseases resulting in a structural change. These structural changes affects the mechanical characteristics, and also potentially it's vulnerability. Previous studies suggest, that steatosis and fibrosis decrease it's vulnerability against blunt force, but detailed studies are yet to be made to validate, and – especially – to quantify these effects.

Mechanical characteristics of liver samples obtained from forensic autopsies were examined. 3.2x3.2x2 cm sized tissue samples were removed during the autopsy, and was exposed to semi-static compression force with a circular metal rod attached to a MecMesin MultiTest dV material tester. The force was measured by an ELS-500N load cell. The force-displacement curves were recorded by VectorPro software. The tissue ellasticity nand force (load) at the time of penetration of the rod into the tissue (Fmax) was determined based on the force-displacement curve. Histological samples were obtained from each tissue block and was evaluated after hematoxilin-eosin (HE) staining. The tissue samples were categorized based on their histological appearance. Elasticity and Fmax values of samples showing different histological appearance were statistically analized.

The preliminary results illustrate how structural changes affects the mechanical characteristics of human tissue, and also demonstrate their efect on resistance against blunt force.

Fatality from firework-induced trauma: a case report

Antun Ferenčić[1], Tomaž Zupanc[1], Martin Mervic[1]

[1] Institute of Forensic Medicine, Ljubljana, Slovenia

There are several reasons why fireworks accidents might happen, but they frequently result from faulty handling, inappropriate storage, manufacturing flaws, or unanticipated events. While fireworks are appreciated at festivals and festivities all over the world, mishaps can cause property damage, casualties, and even fatalities. Governments and organizations frequently stress how crucial it is to follow safety guidelines, hire certified experts for large displays, and inform the public about responsible usage of pyrotechnics to reduce the likelihood of mishaps. Accidents can still happen even with these precautions, emphasizing the importance of ongoing awareness and safety protocols when handling fireworks. Related to the above, we would like to report on the tragedy that befell a Slovenian family in January 2024, where a 56-year-old woman died after being hit by a stray firework launched by a relative. Fireworks are commonly used in Slovenia to celebrate various occasions and events, such as national holidays, New Year's Eve, and other special festivities. One of the most significant events where fireworks are prominently featured is during the celebration of New Year's Eve when people across the country gather to welcome the new year with spectacular fireworks displays. This case demonstrates the dangers of unsafe pyrotechnic handling and an interesting and rare possibility of a mechanism of injury. This case depicts a bizarre death resulting from an unsafe approach to enjoying fireworks and a combination of unfortunate circumstances. Additionally, the presented pathomechanism of the occurrence of fatal injuries should be used in future similar cases and should help in developing additional protective measures in handling pyrotechnics.

Death by acute myocardial infarction after whiplash injury: natural versus Posttraumatic death

Tena Sadlo[1], Elizabeta Matuzalem Marinović [1], Boris Dumenčić,[1], Ines Šunjić [2], Darija Alpeza[1], Luka Klobučarić[1]

[1] University Hosital Centre Osijek, Osijek, Croatia
[2] University Clinical Hospital, Mostar, Bosnia and Herzegovina

Whiplash injury is a common clinical diagnosis in subjects involved in traffic accidents. It often presents a medico-legal problem as it is usually not detected with radiological diagnostic methods and it's very easy to simulate at medical examination.

We present a case of a 72-year-old man that passed away after participating in a traffic accident. Upon emergency team examination, he reported no pain but had difficulty moving his upper extremities. Other than an open wound on his forehead, he had no other external signs of trauma. Schantz's collar was administered by the emergency team on site of the accident. Shortly after, he was examined in a local hospital where his neurological symptoms were getting progressively worse: he had complained about neck and left upper arm pain and the physical exam showed weakness of the upper extremities. Radiology diagnostics done the same day showed no signs of acute trauma to the head or neck other than frontal soft tissue hematoma, but noted senile and degenerative changes of the musculoskeletal and vascular systems. Thorax and abdomen were examined with no signs of acute trauma or pathological process. The same day, the patient was admitted to a clinical hospital for further examination and care. Weakness of the upper limbs and right leg were noted. His condition continued to deteriorate day after admission, as he developed respiratory deficiency. Pulmonary thromboembolism was ruled out by CT angiography and an endocrinologist, infectious disease specialist and cardiologist consultations were done regarding his new onset symptoms. The fourth day after the accident, he had developed respiratory insufficiency and was intubated and mechanically ventilated in an intensive care unit until his death on the fifth day after the accident.

An autopsy was done the day after, with special effort to visualize the central and peripheral nervous system. Autopsy and histology determined the immediate cause of death: acute myocardial infarction that was estimated to be around 3 days old. Discrete epidural hemorrhage of the cervical spine as well as pronounced edema and contusions of the cervical spinal cord were also found on inspection, and confirmed microscopically.

With this case we want to highlight the importance of thorough autopsy even in cases where there is an obvious clinical incident-death correlation, because in court, everything can be questioned except a substantial trauma proven by autopsy.

Determination of the post-mortem interval by assessing the viability of chondrocytes in the knee joint of pigs under winter conditions

Marko Cvetko[1], *Armin Alibegović*[2], Mitja Gombač[1]
[1] Veterinary Faculty, Institute for Pathology, Wild Animals, Fish and Bees, University of Ljubljana, Ljubljana, Slovenia
[2] Faculty of Medicine, Institute of Forensic Medicine, University of Ljubljana, Ljubljana, Slovenia

Determining the postmortem interval (PMI) is one of the most important challenges in veterinary and human forensic medicine. Despite decades of research, the accuracy of PMI determination methods has not significantly improved, especially those used in the late postmortem period. The reason for the inaccuracy is primarily external (surrounding) factors that affect the rate of decomposition, as well as a small number of researches in the natural environment. Among the more important external factors are temperature, humidity, and the presence of arthropods, and the burial of the corpse also has a significant effect on decomposition, with the speed of decomposition being related to the type of soil and the depth of burial. When determining the PMI, the influence of these factors can be avoided by using compartments, which are anatomically separate parts of the body, protected from the influence of the environment and, to a certain extent, from the decomposition process. These include cartilage, tissue made of extracellular matrix (ECM) and chondrocytes, which are the only population of cells in the tissue that have been found in vitro to maintain their viability long after death under optimal conditions. The aim of the present study was to investigate the effects of time, temperature, and burial in a natural environment on the viability of chondrocytes in porcine femoral condyles using confocal laser scanning microscopy. Hind trotters from 10 pigs were buried or left unburied. Samples were collected daily and stained with a combination of vital dyes (calcein-AM and ethidium homodimer-1). The chondrocytes showed an intense staining corresponding to their vitality. In the first 3 days, viability decreased slowly and showed no statistical difference between buried and unburied samples. After the first 3 days, it decreased rapidly, with the viability of the buried samples being 66% on day 4, decreasing to 25% on day 8 and to 16% on day 10, while in the unburied samples it decreased to 43% on day 4, 13% on day 8 and 5% on day 10. Our results indicate a time, temperature, and burial dependent decrease in chondrocyte viability and suggest the use of chondrocyte viability as a marker for estimating PMI in both the natural environment and in animals, as well as its potential use in humans.

Evaluation of the effect of ozone disinfection on forensic presumptive and confirmatory tests of blood, saliva, and semen stains

Vivien Fejes[1], Gábor Simon[1], Katalin Sipos[1,2], Viktor Soma Poór[1]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] University of Pécs, Faculty of Pharmacy, Department of Pharmaceutical Biology, Pécs, Hungary

The COVID-19 pandemic shed light on the fact that certain situations – like another pandemic or bioterrorism – might require the inactivation of microbial contaminants in forensic casework samples. At the moment, no internationally accepted method is available to effectively inactivate the microbes and parallelly maintain the integrity of the biological material. Although the application of ozone disinfection has a long history, there is no sufficient knowledge about its usage in scientific life.

We investigated the effect of ozone disinfection in 400 ppm concentration on presumptive and confirmatory testing of forensically relevant stain types, like blood, saliva, and semen. 10 µl of each body fluid was applied on a white cotton sheet in ten times dilution series. After an hour of drying, half of the samples were subjected to a 20-minute long ozone treatment, while the rest served as controls.

Luminol testing of blood revealed that the undiluted and ten times diluted stain showed no statistically significant difference between the chemiluminescent intensity of ozone-treated and control samples; however, a statistically significant difference was observed in the case of hundred times dilution. The amylase enzyme activity showed a drastic decrease in undiluted saliva stains compared to the control samples. Basically, the ozone treatment inhibited the enzymatic activity-based body fluid identification. The acid phosphatase detection with the STK Lab kit was successful from undiluted and ten times diluted semen stains as well, although the target molecule is also an enzyme, as in the case of the amylase test. Unfortunately, the hundred times diluted fell under the detection limit of the applied method.

The morphological examination of spermatozoa revealed no visible change in the unstained and stained cells. The immunochromatographic assays of all three body fluids showed decreased sensitivity after ozone treatment. The tissue-specific mRNA detection was successful in all cases; however,

degradation was observed compared to the control samples. Even though the threshold values of saliva-specific mRNA markers were high in the control samples, the specific markers remained detectable from ozone-treated samples within 45 cycles.

The ozone treatment affected all the investigated presumptive and confirmatory tests in variable degrees, except the microscopic sperm identification. Although the blood and semen stain detectability did not suffer as much as the saliva, a significant decrease was observed in the sensitivity of the tested methods in diluted stains.

Morphology of the sequelae of increased intracranial pressure

Natasha Davcheva[1,2,3]

[1] Institute of forensic medicine, Faculty of medicine UKIM Skopje, Skopje, Macedonia
[2] Faculty of medical sciences UGD Shtip, Shtip, Macedonia
[3] Faculty of medicine, University of Maribor, Maribor, Slovenia

With the introduction of the concept of primary and secondary brain injuries, it became clear that the outcome of one particular cranial-cerebral injury greatly depends on the secondarily initiated mechanisms, which are actually resulting of raised intracranial pressure (ICP). We can conclude about the existence of the raised ICP during person was alive, at the postmortem examination only by its effects on the brain tissue i.e. the signs of internal herniation as sequelae of it.

This paper discusses our findings on the sequelae of raised ICP based on neuropathological examination of 80 forensic cases of closed head injury with a survival until 1,5 month.

Our findings indicate that the herniation of the brain is going to occur in the first 10,5 days in 90% of the cases and in nearly half of them this deadly consequence can occur in the first 48 hours, which is of great clinical importance.

Sternal aspiration as a method of sampling for diatom test

Viktor Soma Poór[1], Dominika Szűcs[1], Vivien Fejes[1]

[1] University of Pécs, Medichal School, Department of Forensic Medicine, Pécs, Hungary

Diatom test is the most widely used method aiding the diagnosis of drowning. The presence of waterborne unicellular organisms in the organs of systemic circulation, such as spleen or bone marrow, is vital sign, confirming the diagnosis of drowning.

The successful sampling is crucial for this application: risk of contamination, ease of use and costs should be considered choosing the right technique.

Bone marrow aspiration is widely used in the field of haematology. We have adapted this technique in the context of forensic autopsy.

We have performed the sternum aspiration technique on five suspected drowning victims. Additional tissue samples were taken: lung, spleen and bone marrow from the femur. The specimens were digested with proteinase K and analysed with light microscopy. Following DNA extraction, PCR based test was also applied.

Results obtained from the sternum aspirates were in accordance with the rest of the samples, also proved to be more sensitive compared to the femur bone marrow.

Application of sternum aspirate has several advantages: simple, easy to perform, reduces the chance of contamination.

Forensic toxicological aspects of legally distributed cannabidiol products

Mátyás Mayer[1,2], Viktória Varga[1], Mónika Kuzma[1]

[1]University of Pécs, Medical School, Department of Forensic Medicine,
[2]University of Pécs, Clinical Centre, Department of Laboratory Medicine

Nowadays, the possibilities of medicinal applications of phytocannabinoids (e.g. pain relief, antiepileptic effect, etc) are the subject of many researches. At the same time, the number of dietary supplements and other products containing phytocannabinoids produced under uncontrolled conditions is increasing, so the group of customers is also expanding. Since the marketing of these products in Hungary is not currently under strict regulation, their composition and active ingredient content may differ from the composition and active ingredient content indicated on the packaging.
The best-known components of phytocannabinoids are cannabidiol (CBD) and delta-9-tetrahydrocannabinol (THC), which are structurally very similar to each other. CBD is the main component of the previously mentioned dietary supplements, but THC has a psychoactive effect and is classified as a controlled substance. For the routine detection of THC, the police use rapid drug screening (RDS) test in urine based on immunochemical reaction. RDS test can give false positive result due to chemical cross-reaction with related compounds.

Hungarian medical reports of injuries: evaluating terminological and medical consistency in traumatology

Zoltán Patonai[1], *Attila Gátos*[1], Katalin Fogarasi[2]

[1] University of Pécs, Clinical Centre, Department of Traumatology and Hand Surgery, Pécs, Hungary
[2] Institute of Languages for Specific Purposes, Semmelweis University, Budapest, Hungary

In Hungary, medical reports derived from outpatient records serve as crucial assessments of injuries. However, inconsistencies and inaccuracies within these reports pose significant challenges for forensic experts and judicial proceedings. This study aims to conduct a comprehensive analysis of medical records, from both terminological and medical aspects, particularly in injuries of the head and neck region across Hungary. By comparing documentation practices and evaluating criminal legal and medical implications, the research sheds light on terminological deficiencies resulting in medical, insurance medical, and forensic consequence. Authentic medical records are analyzed using both manual and statistical methods, contrasting findings with previous research and international standards. Notably, soft tissue injuries in the head and neck region are frequently categorized using ICD categories, culminating in terminological inaccuracies. Approximately 15% of cases exhibit discrepancies between Hungarian and Latin diagnoses, contributing to additional ambiguity. Descriptions of fractures frequently rely solely on subjective symptoms, such as sensitivity to pressure or pain. This study aims to improve the quality and coherence of medical documentation, thereby enhancing forensic and judicial processes in Hungary's medical and legal landscape.

HIV/AIDS, human rights and medical law - a review from Sri Lankan perspectives

Saratchandra Kodiakra[1]

[1] Department of Forensic Medicine, Faculty of Medicine, University of Peradeniya, Peradeniya, Sri Lanka

'HIV/AIDS, human rights and medical law' is an emerging theme worldwide since there is a frequent tendency to discriminate against people living with HIV/AIDS (PLWHA) and therefore rights of whom are imminently in jeopardy. This communication highlights the current Sri Lankan perspectives on HIV/AIDS, human rights, and medical law. The constitution of the Democratic Socialist Republic of Sri Lanka, National policies on HIV/AIDS, legislative enactments, case law, and ministerial directives were analyzed in the context of the rights of PLWHA.

Though the rights of PLWHA are not directly addressed by the human rights law or constitution, three national policies have been introduced to ensure the rights of PLWHA. Sri Lanka is a signatory to international conventions in relation to HIV/AIDS and human rights, but the extent of direct judicial binding power of those conventions is arbitrary unless they are incorporated into the domestic law. There are no specific legislative enactments with regard to the rights of PLWHA. However, two landmark verdicts have been given by the Supreme Court of Sri Lanka in this regard. There are a few ministerial directives that preserve the rights of the PLWHA.

Overall, there are deficient, vague, and contradictory areas in the law with regard to the rights of the PLWHA. Human rights of PLWHA should be ensured by specifically incorporating them into the new constitution which will be enacted very soon. A separate legislative enactment should be imposed addressing issues related to the authority for examination, consent, privacy, clinical examination, investigation, reporting, proper maintenance of the records, confidentiality, and disclosure of information.

POSTER SESSION (I)

P01 - The influence of blade properties on stab wound mechanics

Veronika Heckmann[1], Carlotta Schwirtz[1], Gábor Simon[1], Tamás F. Molnár[2,3]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary
[2] Department of Surgery, Petz A University Teaching Hospital, Győr, Hungary
[3] University of Pécs, Medical School, Department of Operational Medicine, Pécs, Hungary

The forensic expert often encounters the task of assessing the stabbing force in case of a stabbing injury or assessing the stabbing capabilities of a particular weapon: how large force has to be applied by the perpetrator with a specific knife for skin penetration in an attempted stabbing. The stabbing capabilities of 18 ordinary household knives on pork loin were examined. The stabbing experiment was conducted with a MecMesin MultiTest-dV material Tester with a stabbing speed set to 1000 m/s. The stabbing force was recorded by an ELS 500N load cell. The VectorPro MT software registered the force-displacement curve. Statistical analysis was performed with IBM SPSS software.

The average maximal stabbing force (Fmax) was between 14.07 and 174.22 N. After the skin penetration, the force (load) declined in the case of most instruments, but some knives showed stagnating load during further penetration. Oscillation in load appeared in the case of implements with serrated blades. Correlation and multiple regression analysis showed that only tip radius and blade thickness correlate with the Fmax value, with tip radius showing a stronger correlation.

P02 - A simple, portable, non-digital device for forensic analysis of cervical spine injuries caused by sharp force

Árpád Szabó[1], Tímea Mai[1]

[1] Department of Forensic Medicine, University of Szeged, Szeged, Hungary

Accurately recording the spatial relationships of even the tiniest and most superficial injuries of multi-part bony structures with complex surfaces and mobility is essential for determining the body position at the time of the injury. By sword inflicted injuries, the linear alignment of the lesions of each bony unit provides a guide to determine the shape of the cervical spine and thus the head posture.

In case of repetitive, incised type cervical spine injuries, the relationship between the clearly defined cutting directions and planes provides useful information about the type of the sword and about the nature of the fatal event (e.g. battle between horsemen, footsoldiers, slaughtering fleeing civilians, or execution).

We demonstrate the applicability of simple, commercially available, everyday objects to adjust vertebrae and injury.

P03 - Farm tractor worker decapitation case

Ivana Andric[1], Katarina Vitosevic[1], Filip Mihajlovic[2], Stevan Matic[3], Zivana Slovic[1], Milos Todorovic[1]

[1] University of Kragujevac, Faculty of Medical Sciences, Department of Forensic Medicine, Kragujevac, Serbia, Kragujevac, Serbia
[2] University of Kragujevac, Faculty of Medical Sciences, Department of Pharmacy, Kragujevac, Serbia, Kragujevac, Serbia
[3] Institute of Pathology and Forensic Medicine, Military Medical Academy, Belgrade, Serbia, Belgrade, Serbia

Serbia's agricultural sector relies heavily on farm workers who operate tractors and other associated heavy machinery mostly attached to the vehicle itself. With that in mind, they are at high risk of occupational and road traffic-related fatalities. Decapitation resulting from these accidents is an exceptional outcome.

The victim was a 61 year-old male farmer who was working alone during the entire Saturday, by himself, without any other witnesses, it remained a mystery when he was found decapitated laying down on the stomach. His decapitated head was found next to his right arm, near the outer part of the rear right tractor tire, while his body was positioned in front of the rear right tractor tire.

The irregular, lacerated wound on the decapitated head was at an acute angle. The right earlobe was also amputated. There were also destructions of the tissue of the inside surfaces of the left upper arm and the right forearm, with shredded, and black stained parts of the tissue, that after washing and further examination, resembled friction burns. Furthermore, due to the staining, there was a dilemma if hot diesel has contributed to the injuries on the arms. On the upper part of the back, the print of the tractor tire pattern was seen.

Internal findings showed significant brain edema, bilateral subdural and subarachnoid hemorrhage, and complete horizontal laceration of the pontomedullar junction and basilar artery. The neck organs, along with the tongue, were mostly destroyed, with partly destructed tongue, pharynx, eosphagus and hard palate. The other findings showed blood aspirations in lungs, negative pneumothorax, but a positive air embolism test. Multiple fractures of the left ribs, and decollmant on the front side of the left thigh and right lower leg.

Toxicological analysis detected an alcohol concentration of 2, 87 promille in blood, while other substances are excluded. The cause of death was decapitation and manner of death was determined to be accidental.
In this case, without witnesses, the autopsy was vital in reconstruction of the crime scene based of the injuries involved. In each case of decapitation, it is necessary to find vital reactions and exclude postmortem mutilation.

P04 - Obscure reason of sudden death

Kálmán Rácz[1], *Anita Gál*[1], Andrea Kurucz[2], Péter Attila Gergely[1]

[1] Department of Forensic Medicine, Faculty of Medicine, University of Debrecen, Debrecen, Hungary
[2] University of Debrecen, Faculty of Medicine, Cardiology and Heart Surgery Clinic, Debrecen, Hungary

Forensic medical experts commonly investigate cases of sudden and unexpected deaths due to natural causes. The most frequent cause of it is cardiovascular. The potential causes of sudden cardiac deaths may be classified into coronary and non-coronary groups, the latter including, for example, valvular heart disease, cardiomyopathies, myocarditis, hypertensive heart disease, cardiac conduction abnormalities or genetically caused cardiac arrhythmias. We would like to present the case of a 48-year-old woman.

Postmortem examination was performed two days after the death. During the autopsy, samples were collected for histological examination, as well as blood and urine for alcohol analysis plus toxicological examination.

Despite the signs of advanced decomposition observed during autopsy, no significant abnormalities were found in the internal organs. Histopathological examination of the heart revealed significant disorganization and fragmentation of the myocardial tissue structure, which may have caused cardiac arrhythmias. Based on the information obtained from the deceased's family physician, the etiological role of Lyme carditis or SARS-COVID-19 is suspected. Toxicological examination of the above mentioned samples did not reveal detectable levels of any agent of toxicological significance and no alcohol was present in the blood sample. This case illustrates the challenges in determining the precise cause of death in cases of sudden cardiac death lacking specific morphological alterations.

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P05 - Simultaneous intracerebral and esophageal varices bleeding: a forensic exploration of a complex medical problem

Ljupco Cakar[1], Zlatko Jakovski[1], Goran Pavolski[1], Natasha Bitoljanu[1], Viktorija Belakaposka Srpanova[1], Ana Ivcheva[1], Rosica Siamkouri[1], Aleksandar Stankov [1]

[1] Institute of Forensic Medicine, Criminalistics and Medical Deontology, Faculty of Medicine, Ss. Cyril and Methodius University, Skopje, Macedonia

This case report documents a rare occurrence of simultaneous intracerebral hemorrhage and hemorrhage from ruptured esophageal varices. Such concurrent conditions pose significant diagnostic and therapeutic challenges, especially in posthumous evaluations.

An exhaustive postmortem examination was carried out on a 70-year-old male, found deceased in the bathroom of his residence with early signs of putrefaction. The decedent had a history of alcoholism and untreated hypertension. A comprehensive medico-legal autopsy was conducted at the Institute to ascertain the cause of death.

The external examination revealed expelled dried black fluid on the face, hair, beard, and front of the shirt, indicative of severe internal bleeding. Cranial cavity exploration uncovered intracerebral hemorrhage within the white matter of the left hemisphere, specifically in the area of the internal capsule. Additionally, dissection of the esophagus exposed ruptured submucosal varices accompanied by band-shaped, vertical bleeding patterns. Examination of the stomach contents revealed 800 cc of black fluid, consistent with hemorrhaged blood.

The dual presence of intracerebral hemorrhage and esophageal varices rupture, each a potentially fatal condition, underscores the importance of meticulous postmortem examinations. Often, forensic analysis may prioritize one finding over another, potentially overlooking concurrent causes of death. This case exemplifies the necessity for thorough autopsies to accurately determine the cause of death. Moreover, this principle extends to clinical settings, particularly in emergency departments. Medical personnel must remain vigilant for multiple life-threatening conditions, especially in patients presenting with complex histories. This report emphasizes the critical need for comprehensive assessments to ensure no significant condition is overlooked, ultimately improving patient care and outcomes in both forensic and clinical environments.

P06 - Anything can be a weapon. Histological comparison of shot wounds caused by atypical and modified firearms. (Case report)

Gábor Papp[1]

[1] University of Szeged, Szeged, Hungary

Gun-related injuries are relatively rare in Hungary, because difficult to get a firearm, due to strict gun laws. Hunting and sport guns are available with a licence, but almost impossible to get a permission to have a short-barrelled gun. As a result, modified non-lethal firearms sometimes used for suicide or rarely homicide.

We compared the autopsy, and histology examination results of four suicides committed by different firearms.

- a regular handgun (9 mm Parabellum)
- a gas gun with using a bolt tip put in the muzzle as projectile
- a modified gas-alarm gun (rebuilt to use a .22LR sport gun cartridge)
- a penetrating type captive bolt device, originally used for animal stunning before slaughtering

In all cases there was a single headshot. In the first case, the death set in immediately. The circumstances of the second case were uncertain, the victim found dead. In the third case there was a three days survival, after an operation. In the last case, the survival was four days.

We used HE, and Crossmon trichrome stains for the histological examination. Besides that, there were examined unstained sections with phase contrast microscopy.

The cause of the death in all four cases was the gunshot wound. In those cases where the victim died on the scene, death was directly caused by the brain damage. The two persons found alive underwent neurosurgery, and died of intracranial haemorrhage. The 9 mm bullet was not found during the autopsy, it penetrated the skull. The .22LR bullet, and the bolt remained in the brain. Vital signs were detectable, except the first case proving the survival. This was important in the second case, where the exact time of survival was not known based on the crime scene data but the blood aspiration in the lungs proved a 15-30 minutes survival time.

During the histological examination, tissue damage caused by mechanical and thermal effects could be separated. There was detectable the soot precipitation except the captive bolt pistol. In the two surviving persons initial signs of incipient wound regeneration were observed. The Crossmon stained sections, and the phase contrast examination showed the different connective

tissue damage of the four injuries. Histologically verified blood aspiration proved the survival in the second case.
These cases prove that non-lethal weapons or animal stunning devices can cause death. Comparing the different injuries we can determine the device. Histology can distinguish between the different types of firearms. Phase contrast microscopy is suitable to examine the structural distortion of connective tissue caused by the high-speed projectiles. Histology can clarify the circumstances of the injuries. The results of the histological examination must be analysed as a whole, not just the injuries and the affected area. The histological examination allows to ascertain the time between the shot and the death if the scene investigation was unable to do so.

P07 - Positional asphyxia: accidental death due to head-down position in a badger sett

Alžbeta Ginelliová[1], Daniel Farkaš[1], Silvia Farkašová Iannaccone[2], Alica Gurková[1]

[1] Medico-Legal Department of Health Care Surveillance Authority, Košice, Slovakia
[2] Department of Forensic Medicine, Faculty of Medicine, Pavol Jozef Šafárik University, Košice, Slovakia

Death from positional asphyxia occurs when the victim is found in a position that interferes with adequate breathing. A complete investigation of the circumstances leading up to and surrounding the death should be conducted, to exclude other possible causes of death (both natural and violent) before making the diagnosis. We present an unusual case of a 67-year-old man who was found deceased trapped in a badger sett. The autopsy revealed marked congestion, cyanosis and a multitude of pinpoint hemorrhages in the face, neck and upper chest. Confluent scleral and conjunctival hemorrhage were observed and numerous petechial bleedings were found in the oral mucosa and within the reflected scalp. Death was attributed to positional asphyxia due to head-down position in a badger sett.

P08 - Snip and shock: a case report of genital self-mutilation with insights into associated factors

Kitti Sági[1,2], Gábor Simon[2], Veronika Heckmann[2], Antal Kricskovics[1], Mátyás Mayer[2]

[1] Hungarian Institute for Forensic Sciences - Department of Forensic Medicine, Budapest, Hungary
[2] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

We present a case study involving a 52-year-old man with no prior psychiatric history, discovered deceased in his residence. During the on-site examination, conducted with the assistance of a forensic pathologist, two testicles, a pair of scissors, and a blade were discovered in the bathroom sink. Subsequent post-mortem examination revealed an incision on the scrotum.
Autopsy findings confirmed the cause of death as hypovolemic shock due to self-castration, resulting in injury to the testicular artery. The clinical manifestations of self-inflicted genital mutilation are diverse, with no consensus on etiology. In some instances, it is linked to substance abuse and psychiatric disorders, while in others, it may be indicative of underlying suppressed transsexualism.
In this particular case, previous medical records indicated a history of self-harm in the genital region, and witness testimonies suggested a history of severe alcohol abuse. Furthermore, during the on-site inspection, data were found indicating that the patient had previously been affiliated with the UCC believers, which deny the existence of the Hungarian state.

P09 - Analysis of biological samples from drug users treated in healthcare

Éva Sija[1], László Institóris[1], Róbert Berkecz[2], Roland Weiczner[1], Éva M Kereszty[1], Beáta Havasi[1], Imre Földesi[3]

[1] University of Szeged, Department of Forensic Medicine, Szeged, Hungary
[2] University of Szeged, Institute of Pharmaceutical Analysis, Szeged, Hungary
[3] University of Szeged , Institute of Laboratory Medicine, Szeged, Hungary

Illicit drug use patterns are changing extreme dynamically, more and more new drugs are appearing on the market. While forensic toxicology experts are able to follow the drug market with a few months' delay using specific testing methods and coordinated cooperation between authorities and researchers, healthcare professionals involved in patient care can rely on the results of rapid urine tests in the therapy of intoxicated patients in Hungary.
In our work, the urine samples of patients were analysed using instrumental techniques (GC-MS and LC-MS/MS) in suspected of intoxication cases when a multi-drug rapid test was requested by the attending physician from the Institute of Laboratory Medicine of Albert Szent-Györgyi Medical and Pharmaceutical Centre. A total of 66 urine samples were analyzed with GC-MS and LC-MS/MS, and the results were compared with the results of the multi-drug rapid test. (Ethical licence number: 5068)
- The presence of THC was indicated in 8 samples by the drug rapid test, however, the metabolite of THC (THC-COOH) was detectable in only 4 samples by instrumental analysis.
- N-ethylhexedrone (a new cathinone-type designer drug) was detected in 8 urine samples by GC-MS. New designer drugs are undetectable by multi-drug rapid urine test.
- In the urine sample of a two-year-old girl, 180 mg/ml MDMA and 20 ng/ml amphetamine could be detected. The multi-drug rapid test was not able to detect MDMA and the concentration of amphetamin was below the detection limit, in this case the multi-drug test result was negative. Although the instrumental studies did not include tricyclic antidepressants, phencyclidine, or barbiturates, the measurement results still provided a couple of lessons. The main conclusions of our work are as follows:
- It is advisable to choose the type of rapid test to cover as much as possible the most popular classic illicit drugs on the drug market.
- It should be taken into account that the false positive rate is much higher for some substances: for THC, 50% of the results were false-positive.

- Currently, new designer drugs, which are undetectable by rapid tests, account for about 40% of the drug market.
- In the case of under-age drug use, rapid test results should not be relied on under any circumstances, as the lethal dose may be below the cut-off value of the test.

P10 - Change in correlation of ethanol concentration in blood samples and vitreous fluid in autopsy material

Filip Mihajlovic[1], Zivana Slovic[2], Ivana Andric[2], Milos Todorovic[2], Snezana Djordjevic[3]

[1] University of Kragujevac, Faculty of Medical Sciences, Department of Pharmacology and Toxicology, Kragujevac, Serbia, Kragujevac, Serbia
[2] University of Kragujevac, Faculty of Medical Sciences, Department of Forensic Medicine, Kragujevac, Serbia, Kragujevac, Serbia
[3] University of Defense, Medical Faculty of the Military Medical Academy, Belgrade, Serbia, Belgrade, Serbia

Vitreous humour (VH) is an alternative sample for post-mortem analysis of drugs and psychoactive substances when a peripheral blood sample is not readily available or is inadequate.
Determining the change in concentration and in correlation of ethanol in blood and VH sample pairs in autopsy material during time: after sampling, after one month and after three months.
An analytical, observational, prospective, and autopsy design study with repeated measurements in three-time intervals was conducted. To determine the concentration of ethanol, blood from the femoral vein and VH were taken during forensic autopsies at the Department of Forensic Medicine and Toxicology, University Clinical Center Kragujevac. The samples were analyzed by gas chromatography with the head-space technique (GC/HS). Positive sample pairs (ethanol concentration greater than 0.1 mg/ml) were adequately labelled and stored (-20°C).
The study consisted of 31 subjects who met inclusion criteria. Ethanol concentration decrease in the blood samples was noted after comparing different concentrations of samples during time: analysed after sampling and after one month ($p=0.001$) and after sampling and after three months ($p=0.014$). A decrease in ethanol concentration in VH exists in samples labelled after one month ($p=0.000$) and in samples labelled after three months ($p=0.000$). The correlation between ethanol concentration from blood and VH samples was also observed at three measurement time points. If we take into account that the theoretical blood/VH correlation ratio is 1.15 - 1.20, the value of the correlation in the samples after the autopsy was $r=0.995$, after one month $r=0.994$, while after three months after the autopsy the value of the correlation coefficient $r=0.987$.
The change in the correlation of ethanol concentration in blood samples and VH depends on the storage time and the initial ethanol concentration.

P11 - Medical cannabis and driving: current legal issues in Switzerland

Cristian Palmiere[1], Raquel Vilarino[1], Emilienne Descloux[1], Maria Pia Scarpelli[2]

[1] University Center of Legal Medicine Lausanne-Geneva, Switzerland, Lausanne, Switzerland
[2] INAIL, Catanzaro, Italy

Delta-9-tetrahydrocannabinol (THC) impairs driving performance and other safety-sensitive tasks (eg operating machinery). Under the Swiss Narcotics Act, use of cannabis with a THC content of at least 1% is generally prohibited. On the other hand, the ban on cannabis for medical purposes was lifted in August 2022. Cannabis-based medicines refer to all cannabis-based products used, including flowers, regardless of their legal classification. In Switzerland, general practitioners may, since August 2022, prescribe medicines containing cannabis (e.g. 'magistral preparations', i.e. a medicinal preparation prepared on prescription by a pharmacist). Cannabis-based medicines are mainly used in medical practice to treat chronic pain conditions, e.g. neuropathic pain or pain caused by cancer, spasticity or cramps caused by multiple sclerosis or other neurological diseases, as well as nausea and loss of appetite during chemotherapy.

Interest in cannabis-based medicines has risen importantly in recent years due to the wide range of potential uses. The Swiss Parliament has therefore decided to lift the ban on medical cannabis from 1 August 2022. Exceptional authorisation from the Federal Office of Public Health is no longer required for medical prescriptions. Prescribing physicians must however submit treatment data to the authorities for the first two years of therapy. In principle, it is illegal to drive a vehicle under the influence of cannabis in Switzerland. Currently, the THC limit of 1.5 ng/ml in the blood corresponds to zero tolerance. This is justified by the higher risk of accidents immediately after cannabis use. THC-based preparations obtained on medical prescription are an exception to this rule, but only under certain conditions. In the event of a police check or road accident, medical fitness-to-drive (at the time of police check or road accident) will be assessed. Police reports, medical examinations and toxicological investigations are carried out. In this case, fitness to drive refers to the ability to drive a motor vehicle at the time of the accident. Depending on the situation, general fitness-to-drive medical assessment can also be required, i.e. whether the person is generally fit to drive a vehicle safely. Prescribing physicians must inform their patients that

THC-based treatment may affect momentary and general fitness to drive. The aim of this paper is to briefly discuss current Swiss legal issues affecting patients that might receive medicines containing cannabis, as well as to update physicians on relevant issues and the best guidance to offer their patients.

P12 - Suspected fatal methanol poisoning in an infant: case report

Mojca Dovnik[1], Peter Kadis[1], , Janez Klavz[1], Tina Caks Golec[1]

[1] University Clinical Center, Maribor, Slovenia

Methanol is a colorless, water-soluble alcohol with a mildly sweet taste and odor. It is metabolized to formaldehyde by alcohol dehydrogenase and to formic acid by aldehyde dehydrogenase. Formic acid is the major contributor to severe metabolic acidosis with an increase in the anion gap. The clinical manifestations of intoxication are headache, confusion, lethargy, visual disturbances, and ataxia, progressing to dyspnea, coma, hypotension, and death.

There are only a few deaths due to methanol poisoning in infants reported in the literature. In Slovenia, no precise data on deaths due to methanol poisoning are available due to inaccuracies in the coding of causes of death. Suppose we follow deaths due to alcohol poisoning based on two ICD-10 diagnoses, one being F10.0 Mental and behavioral disorders due to the use of alcohol, acute intoxication, and T51 Toxic effect of alcohol. In that case, we notice that in the period from 2013 to 2018, an average of four children and young people died of alcohol poisoning per year in Slovenia, all of them over 15 years of age.

At the University Medical Centre Maribor, we examined the death of an almost 6-month-old boy born prematurely, who was being followed for a severe perinatal white matter injury. The parents found the boy unresponsive in his cot in the morning after last seeing him alive the previous evening before he fell asleep. Emergency medical help was involved; however, reanimation was not successful. An autopsy was requested, including X-ray and toxicological tests.

Findings included mildly dilated and septated cerebral ventricles, reactively altered cerebellum with multiplying glia adjacent to the ventricles, and intra-alveolar hemorrhage. In addition, the X-ray showed a partially healed spiral fracture of the left humerus. Following toxicological tests by two independent laboratories, it was also found that the boy tested positive for methanol in his blood at a level of 0,86 g/L and 0,75 g/kg, respectively. Methanol was not detected in the muscle tissue collected during the autopsy, but the formic acid concentration in the muscle was 1,68 g/kg.

The brain lesions could be related to the boy's known brain defects. Intra-alveolar hemorrhages can be associated with respiratory failure. However, the finding of an injury that was not addressed by medical staff and high blood methanol concentrations, which are lethal even for a healthy adult without medical treatment, are suspicious for child abuse. Given the age of the boy, the possibility of accidental ingestion of methanol was ruled out as he was not yet able to move around independently. We also excluded the possibility of methanol contamination of the blood in the autopsy area and during resuscitation. In the absence of other apparent causes of death and the presence of high measured blood methanol concentrations as well as high muscle formic acid concentration, there is a strong suspicion that death was due to methanol poisoning and that methanol was ingested before death, despite the fact that no potential source of methanol was found by police investigation.

P13 - A case study analysis of neglect-induced infant malnutrition

Zivana Slovic[1], Ivana Andric[1], Katarina Vitosevic[1], Jelena Matejic[2], Marijana Stanojevic Pirkovic[2], Milos Todorovic[1]

[1] University of Kragujevac, Faculty of Medical Sciences, Department of Forensic Medicine, Kragujevac, Serbia, Kragujevac, Serbia
[2] University Clinical Center Kragujevac, Department for Laboratory Diagnostics, Kragujevac, Serbia, Kragujevac, Serbia

Nowadays, occurrences of child neglect leading to fatal consequences are rare—a testament to improved societal awareness and intervention. There are rarely cases of child neglect due to starvation, therefore we present a case of a child starved to death

We present a case of 19-month-old girl who was unsuccessfully resuscitated at home after loss of consciousness, brought to an Emergency Room. Attempts at resuscitation were unsuccessful and the physicians established malnourished state but the child was clean, in clean wardrobe. The autopsy revealed the child weighed 5480 g and was 78 cm long. Postmortal hypostasis and rigor mortis were barely denotative. Eyes were sunken, due to the loss of the fat tissue around orbits, and the eyeballs showed decreased eye pressure. Bichat's adipose tissue completely atrophied. The teeth were still in development, as central incisors and fist premolars in both jaws were completely developed, and upper right canine is starting to grow. The skin on the entire body was thin, inelastic, dry and without any adipose tissue. No injuries from mechanical or asphyxiating origin were found on the body, as well as no other physical anomalies that indicate the presence of other diseases or syndromes.

The autopsy showed large brain edema. The thymus was atrophied. Subpleural hemorrhages on the lower lobes on both lungs were prominent. A chronic ulcer in resolution was found on the duodenum in communication with pancreas, but no signs of acute pancreatitis were found macro or microscopically. The gallbladder was tense, enlarged, filled with thick bile. Small intestine was filled with small amount of blood, while in large intestine there was a lot of air, with no other contents accept the rock hardened feces in the rectum. The weights of the child's organs were all reduced. Microscopic examination showed normal appearance of the organs, consistent with the microscopic findings. Examination of the entire body showed no fresh or old fractures, dislocations and subluxations. Postmortal toxicological analysis was negative for alcohol, drugs and medicines. Postmortal thanatochemical

analysis was performed. Pre-existing diseases (e.g., malabsorption and cancer) were definitively excluded.

This anomaly stands as a poignant reminder of the persisting vulnerabilities within our societal fabric, necessitating continued vigilance and concerted efforts to safeguard the most defenseless among us. In diagnosing malnutrition, it is important to perform toxicological and microscopical examination, as well as thanatochemical analysis, in order to be certain that the cause of death is food absence or deprivation.

P14 - Domestic violence with fatal outcome in Csongrád-Csanád County between 1998-2022

Beáta Havasi[1], Harmat Kamuti[1], Roland Weiczner[1], Éva Sija[1]

[1] University of Szeged, Albert Szent-Györgyi Medical Centre, Department of Forensic Medicine, Szeged, Hungary

International estimates suggest that more than one billion people worldwide are victims of domestic abuse. Abuse can be physical, sexual, emotional, or neglect, or a combination of these.
The characteristics of domestic violence victims who died in the period 1998-2022 years in Csongrád-Csanád County, Hungary were investigated on the basis of the medical examiner's autopsy reports of the Department of Forensic Medicine University of Szeged, Hungary.
Over the 25 years of the study, 71 domestic violence victims' data were analysed. The gender distribution of victims is almost equal, while more than two thirds of offenders are male. The most common relationship between victims and perpetrators was that of a partner. The youngest victim was 9 months, the oldest was 86 years old. The most populated victim age-group was the 41-50 year-group. Stabbing (usually with a knife) was the main method applied by female offenders, while bodily-force injury (mainly blunt trauma or manual strangulation) was the most common method among male offenders. Blood alcohol analysis revealed that 34% of victims aged 14 years and over was under some degree of alcoholic impairment.
Our study shows that the prevalence of fatal domestic violence in our area has a downward trend over the investigated period. However, the role of alcohol consumption is still a significant risk factor. The main limitation of this study is the lacking data about the perpetrator which hindered the exploration of other characteristics of the offence.

P15 - Stairway to heaven: a case report

Dénes Pauka[1], Gábor Simon[1], Veronika Heckmann[1], Dénes Tóth[1]

[1] University of Pécs, Medical School Department of Forensic Medicine, Pécs, Hungary, Pécs, Hungary

A call to the police was arrived from a man who found his mother-in-law dead in her apartment in the month of autumn. There was no suspicion of non-natural death at the scene, but the cause of death could not be determined, so a pathological autopsy was performed.

During the autopsy, a wooden cross with a maximum 3 cm diameter was found in the upper part of the trachea of the body by the pathologist. The autopsy was suspended, and the police ordered a medicolegal autopsy. Besides the autopsy findings of asphyxia, many, few centimeter-wide pieces of torn pages of an older print of the Bible were found in the stomach, adhered together into a large block. After the autopsy, a toxicological examination was performed, and the police were asked for additional information about the victim.

No alcohol, drugs or any narcotics were found in the blood with the toxicological examination.

Based on the additional information by the police, the deceased had a several-year history of anxiety disorder, depression and paranoid psychotic disorder, which were treated in the psychiatry ward before, and antipsychotic drugs were also given to the victim. No religious psychotic symptoms were recorded, but in the last half year (during the COVID lockdown), the victim could not get the proper medicine, which triggered her religious delusions.

P16 - A suicide case in strangulation by ligature - case report

Zoltán Hendrik[1], Csaba Turzó[1]

[1] University of Debrecen, Faculty of Medicine, Department of Forensic Medicine, Debrecen, Hungary

Suicide case is strangulation with is a relatively by strangulation is a relatively rare but previously documented phenomenon in forensic medicine. Some meta-analyses on the subject found only a few dozen cases in the literature. In our case report, we present the suicide of a 77-year-old woman. The elderly woman was living with her husband in a nursing home when the husband died of natural causes. After that, the widow became more withdrawn, avoided company and showed signs of depression.

A few months later the nursing staff found her dead on the floor of her apartment. The walls and floor of the room and bathroom were covered with blood drops, and there were a few smaller - bigger blood puddles in the bathroom and around the body's head in the room.

The belt of the bathrobe was wrapped around the corpse's neck and a wooden back-scratching stick was inserted in it and twisted several times.

During the autopsy, a closed strangulation groove with epidermal abrasions and a partially dried surface was observed on the neck.

Dot like hemorrhages were presented on the hairy scalp, in the conjunctival sacs on both sides of the eyes, and under the visceral pleura, while the lungs were expanded.

Moreover, there were blunt bruises around the left eye inner corner and around the nose, and a laceration on the left occiput.

Histological examination showed blood accumulation within the superficial layer of the neck's muscles, while in the lungs, - as a sign of acute, so-called vicarious emphysema - the rupture of the alveolar septa and the accumulation of blood within alveolar spaces were confirmed. She was not under the influence of alcohol or drugs at the time of his death. Based on the investigative data, autopsy and histological findings, the cause of death was suffocation caused by self-strangulation. There were no signs of homicide or other crime.

P17 - Non-natural death among children and teenagers in Budapest and Pest County

Tamás Bányász[1], Balázs Németi[1], György Dunay (†)[1], Klára Törő[1]

[1] Semmelweis University, Department of Pathology, Forensic and Insurance Medicine, Budapest, Hungary

In the past century, the mortality of young people has been steadily declining, however the topic is still significant in our society. The leading causes of death in this age group are those regarded as non-natural, therefore these cases require our special attention.

The goal of our research was to review such cases, collect data and organize them into a database. The data were then analysed to uncover connections or the lack thereof between the circumstances of the deaths. These findings may raise questions and provide a foundation for future research that will help us better understand these events, and ultimately be able to prevent them.

For this, we reviewed the case files of Semmelweis University's Department of Pathology, Forensic and Insurance Medicine. We selected the cases of non-natural deaths where the deceased was under 20 years of age, between the dates 2015.01.01. and 2021.12.31. We categorised the cases by age, manner of death, date of death, and by the place of death. We noted the type of the main injury, and its location on the body. Regarding the circumstances of the death, we checked whether the decedent died in the city or a rural area, whether they received any medical attention prior to death, and whether they had a reported history of mental illness. We also incorporated the results of alcohol and toxicology reports when available. The possible relationship of these variables was then tested using regression analysis and chi-squared tests. In the future, we intend to extend the project to cases until the end of 2023.

During the period in question, our institute worked on 199 cases that met our criteria, of which 64 involved the death of a girl, 135 the death of a boy. Most cases were either non-traffic accidents or suicides with 62-62 cases each (31-31%), followed by traffic accidents (56; 28%) and lastly homicides with 19 cases (10%). Over the years, there was no significant change in the prevalence of the different manners of death, however the day of the week the death occurred on proved to be significant in relation to the manner of death

(p=0,0209). Regarding the place of the event leading to death, we found that there were slightly more violent incidents in the more rural communities (99) than in Budapest (84). When looking at the medical treatment preceding death our data shows that in rural areas victims were significantly (p=0,0035) less likely to receive medical care compared to those injured in Budapest. Information regarding mental health was scarce with 16 cases where the decedent had a reported mental condition, however, their number shows a significant (p=0,0421) rise over the years.

In conclusion, our results indicate, some areas requiring our attention are accident prevention and a greater focus on mental health for this age group. Furthermore, there is great need for interdisciplinary research to better understand the circumstances of these cases, so that we can prevent such tragic incidents.

P18 - The importance of forensic evidence providing injury reports and radiographic images on nasal bone fractures in criminal cases

Karola Petrus[1], Zsófia Mrekváné Burián[1], Gábor Simon[1]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

The forensic evaluation of nasal bone fractures is likely to represent a considerable challenge. On one hand, a large proportion of injury reports partially or completely fail to describe external injuries. On the other hand, the description of and the opinion on the radiographic images are sometimes unclear or – in certain cases – controversial. Moreover, a previous nasal bone fracture can complicate the evaluation further, as it may be impossible to distinguish a prior and a recent/fresh fracture radiologically.
All criminal cases in the last 10 years concerning nasal bone fracture were analysed; and the main challenges and limitations of the forensic evaluation are demonstrated via case reports.
The case reports and the results of our study will be presented in our poster. The evaluation of a nasal bone fracture is of fundamental importance in cases, where the nasal bone fracture represents the only injury constituting aggravated assault. The accurate description of external injuries, the appropriate imaging techniques (X-ray, CT) and their clear results establish the forensic diagnosis of a nasal bone fracture. Thus, incomplete, dubious or controversial data can restrict or event prevent an accurate expert opinion.

P19 - Unusual choice of weapon and motive for suicide

Katarina Vitosevic[1], Zivana Slovic[1], Vanja Canovic[2], Danijela Todorovic[3], Ivana Andric[1]

[1] Department of Forensic Medicine, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia, Kragujevac, Serbia
[2] Department of Forensic Medicine and Toxicology, University Clinical Center Kragujevac, Serbia, Kragujevac, Serbia
[3] Department of Genetics, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia, Kragujevac, Serbia

Adjusted and homemade weapons present a category of firearms that are made, adapted or intended to eject a projectile, gas, liquid, or some other substance through the force of powder gases, air pressure or other pressure means. Handmade weapons may not even resemble real firearms, yet due to their design, they pose a threat not only to citizens but also to their operators. We present a case involving a 47-year-old man found in the isolated boiler room of his house, lying on the floor in a pool of blood. Next to the body was found a handmade firearm. The weapon is made of two metal plumping pipes with different circumferences which were connected with thread. Narrowed metal pipe is space for cartridges, and threaded to percussion detonator in the base. The shot shell is plastic, and the cartridge contains 4 metal balls 10 mm in diameter. Police investigation revealed that the previous night, the deceased was driving a car and was a partaker in a road traffic accident where he was in a collision with another automobile owned by a local criminal. Subsequently, he fled the scene and was found the next day, deceased in the isolated boiler room of his house, lying on the floor in a pool of blood. Upon external examination of the body, the gunshot wound was ascertained in the middle of the chest, fired through his clothes, which is rather unusual when it comes to suicide. The entrance wound was oval, measuring 73x48 mm, with slightly uneven, bloodied and bruised, partially dried reddish edges. The wound channel continues through the chest cavity, with destroyed, dark-red blood-soaked soft tissues, chest organs, and parts of the broken sternum visible in the wound area. On the back of the body three exit wounds were found, along with a bump containing a foreign body, reviling upon dissection and preparation of the soft tissue of the back one large deformed shot with a 10 mm diameter. The direction of the shot channel is from front to back, from right to left, and from top to bottom. No defensive wounds were found on the body.

Although the deceased had no history of depression, previous suicide attempts, known motives or identifiable personality traits, the sudden appearance of unusual circumstances such as fear of consequences, along with a state of poverty led him to unusual motive for an affective suicide. Affective suicides often occur suddenly and impulsively, driven by overwhelming emotions like anger, sadness, or hopelessness. In this case, the individual's impulsive decision to use an available firearm underscores the urgency of addressing emotional crises promptly.

P20 - Murder-suicide or a suicide pact? A case report

Alexandra Mura[1], Beáta Ágnes Borsay[1], Péter Attila Gergely[1]

[1] University of Debrecen, Department of Forensic Medicine of the, Debrecen, Hungary

Suicide, as an act of self-harm, has a special form named a suicide pact, wherein an individual involves another person or others in the act of self-destruction with mutual agreement, often including family members, friends or partners. It can also be involuntary, when the involved participant does not want to commit suicide but is forced or persuaded by the perpetrator; this is termed murder-suicide. In our case report, a middle-aged mother and her minor son stood together on the track in front of a moving Intercity train set headed from Debrecen to Záhony in Hungary.

The two human bodies were severely damaged when they were hit by the train, but the bodies were successfully identified by the investigators. We conducted autopsies of the bodies at the Institute of Forensic Medicine of the University of Debrecen.

The skull bones of the corpses were broken into several pieces, and we identified fractures in various areas of their skeletons. Their organs were extensively damaged, dislodging from their connective tissue attachments. Some organs were transported separately from the corpses, or were not found due to severe destruction. During the autopsy, samples were taken from the available tissues for histological examination, and blood and urine samples were collected for further alcohol and toxicological screenings. Vital reactions on the corpses were also detected macroscopically, allowing us to ascertain the injuries suffered while they were alive.

Based on the investigational data from the police, the mother's unstable private life and depression may have also affected her child, who had recently shown a decline in school performance. As a result, a temporary guardian would have supervised the family members, but the woman might have been afraid that her child would be taken away from her. Their final tragic act may have been based on this misunderstanding. From a legal standpoint, the child's capacity to act can be disputed due to his underage status; legally, he is incapacitated. Therefore, this case is considered a murder-suicide instead of a suicide pact.

P21 - Special poisonings

Helga Szabó[1], Roland Weiczner [1]

[1] Department of Forensic Medicine, Szeged, Hungary

Poisoning means that a material on the body surface or in the living organism leads to a disturbance of the equilibrium of the organism, causing sickness or death. In our expert and autopsy practice, we frequently encounter cases of accidental or suicidal poisoning, involving substances such as alcohol, benzodiazepines, ethylene glycol and carbon monoxide.
However, in recent years a number of special, uncommon poisoning deaths have occurred in our Institute, e.g. poisonings caused by lily of the valley, oleander, aluminum phosphide, and T-61.
In my study, I would like to present these poisoning cases one by one, emphasizing the importance of the autopsy, as some cases would not have been discovered otherwise.

P22 - Challenges in DNA profiling of archived biological traces

Tamás Dominik Czigány[1], András Lászik[2], Olga Nagy[1]

[1] University of Szeged, Albert Szent-Györgyi Medical School, Department of Forensic Medicine, Szeged, Hungary
[2] Semmelweis University, Faculty of Medicine, Department of Pathology, Forensic and Insurance Medicine, Budapest, Hungary

The discovery of microsatellite DNA loci suitable for personal identification were quickly introduce into routine forensic investigations in the late 1990s. The novelties of forensic DNA technology enable to re-examine archived crime scene evidences and revisit doubtful or "cold" cases. Successful DNA analysis of old evidence samples depends on various factors such as preservation, quantity, carrier material, contaminants, etc. We investigated whether storage conditions can affect DNA degradation and the detection of forensic DNA markers on samples kept in our DNA laboratory for almost 25 years.

In order to bypass ethical issues with re-analysing chrime scene evidences we chose samples from the German DNA Profiling (GEDNAP) Stain Commission's sample colllection that were previously analyzed and/or archived in our laboratories. We selected 4 elimination samples (dried blood spots) and 11 stain samples (chewing gum, cigarette butt, envelope, etc.) for analysis.

Samples were stored for different periods (5-25 years) at different temperatures (basement and room temperature) and in different packaging. DNA was isolated using silica column and Chelex® resin with overnight digestion, and the efficiency of the two methods were analysed. Then multiplex PCR was performed with AmpFLSTR™ Identifiler™ Plus PCR kit designed for human identification. Following fragment length analysis DNA profiles were determined by GeneMapperID software and alleles were compared to the archived data.

The obtained DNA profiles from the 5–10 year-old elimination samples preserved as dried blood spots and stored at different temperature showed complete match with the archived data. From a 10 year-old blood stain on a popcorn and semen on a tissue paper, and from a stain on a 18-year-old soap we were able to detect DNA profiles that matched 100% with the archived data.

We detected partial DNA profiles from stains on a 10-year-old tissue paper, and 18-year-old envelope and bandages with 45-75% matching. The analysis of 25-year-old stains on a cigarette butt, a chewing gum and a piece of fabric packed in nylon bags resulted in partial DNA profiles that matched 26%, 92% and 96% with the archived data, respectively.

Our results suggest that sample storage at different temperature did not have an effect on DNA profiling, but the time, packaging and the material of the evidence could cause DNA degradation. Moreover, we found the Chelex® method is more suitable for DNA extraction from old stains, especially when we re-concentrated the DNA sample with column purification into a smaller elution volume. We used this DNA purification method in a case of a 18-year-old condom sample in which we could not show applicable DNA profile previously but after Amicon® Ultra column purification we obtained partial DNA profile matching 56%.

In summary, we were able to show even complate DNA profiles from archived samples using low-cost standard DNA profiling methods in a non-accredited forensic DNA laboratory.

P23 - Which method is the best for DNA extraction from vitreous humour

Vanja Canovic[1], Zivana Slovic[2], Ivana Andric[2], Milos Todorovic[2], Danijela Todorovic[3], Sanja Matic[4], Tijana Markovic[4], Katarina Vitosevic[2]

[1] Department of Forensic Medicine and Toxicology, University Clinical Center Kragujevac, Kragujevac, Serbia, Kragujevac, Serbia
[2] Department of Forensic Medicine, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia, Kragujevac, Serbia
[3] Department of Genetics, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia, Kragujevac, Serbia
[4] Department of Pharmacy, Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia, kragujevac, Serbia

Vitreous humour is a gelatinous and transparent liquid that is 99% water, and the rest is collagen fibers, hyaluronic acid, inorganic salts, organic components and a few cells. Vitreous humour is suitable for forensic analysis because it is easily accessible and isolated from the rest of the body and retinal blood vessels, making it less susceptible to autolytic and putrefactive changes. The main limiting factor for using vitreous humour in forensic genetics is its small cellularity. Due to a small number of cells, it is difficult to isolate a sufficient quantity of quality DNA for further molecular analyses. The method used for DNA extraction from any biological material is, in addition to the type of biological material, a key element in obtaining the best possible quality of DNA.

DNA was extracted from vitreous humour taken from 78 corpses. DNA was extracted using three different methods: commercial kit with a silicone membrane (Pure Link Genomic DNA kit), salting out method (FlexiGene DNA Kit) and organic extraction (Phenol-chloroform isoamyl alcohol). The yield and purity of DNA was measured spectrophotometrically using a FastGene NanoView Photometer. The integrity of the isolated DNA molecule was determined by PCR amplification of the hTERT gene. PCR products were visualized on a 2% agarose gel stained with ethidium bromide and photographed under UV light.

The mean concentration of DNA isolated with Pure Link Genomic DNA kit was 16,34±3,72 ng/µl, with FlexiGene DNA Kit was 46,17±14,84 ng/µl, while the highest mean concentration was obtained using organic DNA extraction with 81,06±23,45 ng/µl. The purest DNA was isolated also using organic extraction with OD260/280 1,8±0,1, while using Pure Link Genomic DNA kit was 1,63±0,76 and FlexiGene DNA Kit only 1,33±0,08. The success rate of PCR

amplification for hTERT gen was 88,45% for organic extraction, 81,06% for Pure Link Genomic DNA kit, and only 53,85% for with FlexiGene DNA Kit. Vitreous humour is a good source for forensic postmortem identification, depending on the method used for DNA isolation. Organic extraction with phenol-chloroform isoamyl alcohol is found to be the most efficient method for DNA isolation from vitreous humour in terms of DNA concentration, purity, and success rate of PCR amplification.

P24 - Biomechanical investigations of soft tissues in the forensic medicine

Evelin Biczó[1], Gábor Simon[1]

[1]University of Pécs, Medical School, Department of Forensic Medicine

In accordance with the relevant directives, forensic pathologist has to assess the degree of force required for inflicting the injury in case of bodily injuries (e.g., stabbing). Based on the recommendations of scientific literature, the amount of force is usually categorized as mild, moderate, or severe. This assessment method applied in everyday practice is somewhat subjective. Only a little information is available about the degree of force required to inflict stab wounds and no information available at all regarding the internal organs. The aim of our study was to determine the degree of force required to inflict stab wounds in the liver, spleen, kidney, and lung.

The measurements were performed with a knife blade attached to a Mecmesin AFG-500 force gauge, which was mounted on a Mecmesin Multitest-dV automatic motorized force tester. The force values causing damage to the organ (F_{min}) and complete penetration (F_{max}) were registered with the program VectorPro. The tissue samples were livers (n=9), spleens (n=8), kidneys (n= 7), and lungs (n=9). All specimens underwent microscopical analysis.

The average F_{min} value was 1,84 N in liver samples (range from 1,2 to 2,5 N, SD± 0,43), 1,4 N in spleen samples (range from 0,7 to 2,3 N, SD± 0,57), 1,55 N in kidney samples (range from 0,5 to 6 N, SD± 1,51), 3,78 N in lung samples (range from 1,4 to 5,9 N, SD±1,59). The average F_{max} value was 12,28 N in liver samples (range from 8,2 to 17,6 N, SD± 3,54), 4,98 N in spleen samples (range from 0,7 to 9,9 N, SD± 3,39), 13,72 N in kidney samples (range from 8,5 to 22,4 N, SD± 3,68), 12,34 N in lung samples (range from 7,4 to 18,9 N, SD± 3,85).

Compared to the data about the skin that can be found in the literature, the degree of force required for penetrating internal organs with a sharp instrument is negligeable. Amongst the organs were examined in the present research, the lung requires the largest amount of force and the spleen is the most vulnerable.

P25 - The forensic significance of core temperature and markers in the detection of primary and secondary hypothermia as a cause of death: an experimental study

Emina Dervišević[1]

[1] University of Sarajevo, Faculty of medicine, Sarajevo, Bosnia and Herzegovina

Hypothermia is defined as a body core temperature below 35°C and can be caused by internal or external stress. Primary hypothermia is caused by excessive exposure to low environmental temperature without any medical conditions prior to that. Secondary hypothermia is caused by alteration in thermoregulation by disease, trauma, surgery, drugs or infections.

The aim of the study is to see the difference and effects in primary and secondary hypothermia with regard to the groups of benzodiazepine or alcohol use.

Materials and methods:The total 21 Wistar rats divided into three experimental groups as: K-Control group rats exposed only to hypothermic action(n=7); H1-A- Alcohol + hypothermia (n=7); and H2-B-Benzodiazepines + hypothermia (n=7). The temperature spots that were analyzed in study were: normal core temperature, core temperature during an injection of 0,3 ketamine, temperature of immersion and the temperature when rats have entered hypothermia and temperature of death.

The core temperature decreased faster in secondary hypothermia groups.The length of survival/survival time was shorter in A and B groups, v. K group

Conclusion: There is a difference between primary and secondary hypothermia depending on consumption and intoxication with alcohol or benzodiazepines that can help in the distinction in sudden deaths when the etiological cause is not clear after macroscopic and microscopic pathological analysis.

P26 - An unusual way of suicide with a hammer and nail in an 84-year-old woman

Ana Ivcheva[1], Verica Poposka[1], Zlatko Jakovski[1], Goran Pavlovski[1], Natasha Bitoljanu[1], Viktorija Belakaposka Srpanova[1], Ljupco Cakar[1], Rosica Siamkouri[1], Aleksandar Stankov[1]

[1] Institute of Forensic medicine, criminalistics and medical deontology, Skopje, Macedónia

Old age is a period involving physical and functional disabilities, as well as a reduction of cognitive function, social life, loss of autonomy, and independence. There has been an increase in deaths by suicide in old age in the last decade. Depression and suicide in the elderly, 60 years and above, is a major global public health concern. Predictors of suicide include mental illness, physical illnesses and also social factors like living alone, which triggers the depressive symptoms and increases the suicidal risk in the elderly. Differences in gender, the aging process and social issues were also contributing factors to methods used for suicide.

Recently, an interesting case of a suicide was studied et our Institute. An 84-year-old woman was hospitalized due to a foreign body present in the area of the head. The woman was admitted in a conscious and contactable state. On the same day, an operation was performed at the neurosurgery clinic, during which the foreign body - a nail - was removed from her head. The patient died on the eighth day after the operation.

During the autopsy, a stab wound was found on the deceased's head in the area of the middle parietal regions, which continued with canal damage through the bones of the skull vault and the right parietal lobe of the cerebrum. The stab canal damage had a total length of 4.5 cm and was directed from back to front, from top to bottom and slightly from left to right. Additionally, in the area of the hairy part of the frontal region and the front two-thirds of the parietal regions, a group of tentative superficial puncture wounds were found, with a surrounding bluish bruise, on a total area of 6x5cm.

From the conversation with the investigative authorities, we got information that the deceased was living in a same house together with her family. The deceased was a vital woman, in a very good physical condition, but in the last period she became depressed, she felt like a burden on the family.

Major depressive disorder has been shown to be the commonest psychiatric diagnosis in elderly suicide victims, and it is also the main cause of suicide in

the geriatric population. According to the literature, there are various predictors of suicide in old age. Before the elderly die by suicide, approximately 30% of this population express their desire to die to a close contact. Geriatric depression is a complex disorder with multiple risk factors. Any form of action taken by the elderly should be investigated and treated. Recognizing and addressing factors that predict suicide in the elderly will help to improve the mental wellbeing of the elderly.

P27 -Impact of the covid-19 pandemic on the distribution of drug investigations in the clinical toxicology laboratory of the up cc.

Dávid Csabai[1], Dávid Hesszenberger[1], Mátyás Mayer[1,2], Mónika Kuzma [1,2], Ágnes Lakatos[1], Anikó Lajtai[1]

[1] University of Pécs, Clinical Centre, Department of Laboratory Medicine, Pécs, Hungary
[2] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

At the Clinical Toxicology Laboratory of the Clinical Centre of the University of Pécs (UP CC), we have been performing qualitative and often quantitative analyses of various drugs, narcotics and toxic alcohols since 2010. In order to treat patients effectively, urgent analyses are necessary in many cases, so our laboratory operates on a continuous stand-by basis. The COVID-19 pandemic that emerged in Hungary in March 2020 posed a number of challenges to the healthcare system, affecting not only ambulatory but also emergency care. Lockdowns and disruption of global supply chains have altered not only the legal trade, but also the production, transportation, and consumption patterns of various narcotics may have changed.
In this study, we analyzed the number and distribution of substances (narcotics and their metabolites) found in patient samples processed in the Clinical Toxicology Laboratory of the UP CC, and examined the impact of the COVID-19 pandemic on these data. The analysis of urine, serum, and occasionally unknown substance samples intended for examination was performed using the Shimadzu HPLC DAD (TOX.IS II) method.
The results obtained from large-scale chromatographic analyses conducted from 2019 to the present (May 2024) were categorized according to various criteria, focusing on traditional and novel types of narcotics for this study. We determined the occurrence and proportion of narcotics and their metabolites in the clinical samples received by our laboratory and correlated our findings with the patients' age, gender, and monthly distribution.
In addition to basic descriptive statistics, we analysed whether the COVID-19 pandemic had an impact on the prevalence and distribution of different substances in the patient population we studied, alongside everyday life, economy, education and healthcare. We also explored the correlation of our results with the national epidemic case rates, mortality data, or trends caused by closures and global supply problems.

Our findings indicate that the pandemic has affected both the ratio of types of narcotics and the quantity of narcotics consumed. Certain substances disappeared, while new ones emerged. Based on the clinical samples we analyzed, we can conclude that the narcotics market can undergo extremely dynamic changes even as a result of global pandemics.

P28 - Illegal migrant transportation: stress death after a police pursuit

Ines Šunjić[1], Vedrana Petrovečki[2], Tena Sadlo[3], Martina Tkalčić[2]

[1] Department of Pathology, Cytology and Forensic Medicine, University Hospital Mostar, Mostar, Bosnia and Herzegovina
[2] Institute of Forensic Medicine and Criminalistics, University of Zagreb, Zagreb, Croatia
[3] Clinical Department of Pathology and Forensic Medicine, Osijek University Hospital, Osijek, Croatia

Stress death (lat. trauma psychicum) is a term that describes death that is caused by a strong emotional experience that leads to additional damage to a previously pathologically altered organ. Death as a result of increased emotional stress often does not occur during the incident itself, but shortly after.

We describe a 25-year-old van driver who was illegally transporting migrants. While driving, he was spotted by the police, who immediately started a vehicle pursuit. He turned into the woods and soon after hit a tree, got out of the car and continued to flee from the police on foot. After a short search, the police found him lying in the grass with no signs of life. The emergency team arrived soon after and pronounced him dead. An autopsy was performed and it revealed that he suffered only superficial injuries and the death did not occur as a result of physical trauma. Histology showed that the deceased had brain edema, severe lung edema, mild myocardial fibrosis and asthma. Toxicological analysis showed that at the time of death, he had cocaine, amphetamine and marijuana metabolite and no alcohol in his blood. Determined concentrations of cocaine (0,22 mg/L) and amphetamine (0,06 mg/L) are often found in blood of person who consumed these supstances.

The death occurred after a police pursuit that led to a state of intense fear and, consequently, an increased effort of the heart and lungs, which had previously been pathologically altered. Also, the presence of cocaine and amphetamine contributed to the fatal outcome.

P29 - Barefoot stomping on the neck?

Árpád Szabó[1], Timea Mai[1]

[1] Department of Forensic Medicine, University of Szeged, Szeged, Hungary

The authors present a forensic analysis of a homicide case in which a suitable object of neck compression was not revealed during crime scene investigation. This circumstance made both forensic medical and trace analysis quite difficult.

P30 - Accidental falls from heights: analyzing the injury patterns

Goran Pavlovski[1], Verica Poposka[1], Aleksandar Stankov[1], Zlatko Jakovski[1], Natasha Bitoljanu [1], Viktorija Belakaposka Srpanova[1], Ljupco Cakar[1], Ana Ivcheva[1], Rosica Siamkouri[1]

[1] Institute of Forensic medicine, criminology and medical deontology, Skopje, Macedonia

Falls from heights can result in various manners of death, including accidents, homicide, and most commonly, suicide. Accidental falls are prevalent in specific occupations, such as construction and high-elevation window cleaning, as well as in activities like sports and hiking, often due to carelessness.

The study aims to identify specific injuries resulting from accidental falls from different heights, focusing on the location, type, character, and severity of these injuries relative to the fall's height.

This research examined 106 cases of individuals who died from falls from heights, all of whom underwent forensic medical autopsies. The cases were categorized into three groups based on the fall height: low (below 7 meters), medium (7 to 20 meters), and high (above 20 meters).

The manner of death for 59 victims (55.66%) was an accident, while for 47 victims (44.34%), it was suicide. A comparison of the three groups with varying fall heights regarding the manner of death revealed that accidents were the most common manner of death among victims who fell from heights of less than 7 meters - 34 (73.91%), followed by victims who fell from heights of 7 to 20 meters and over 20 meters - 19 (50%) and 6 (27.27%), respectively. The manner of death significantly differed between groups A and B (p=0.024) and between groups A and C (p=0.0003). Suicides were significantly more common as a manner of death among victims of medium and high falls compared to those who fell from low heights. The largest number of injuries were found on the head expressed as contusions of the brain 37(62%), followed by skull fractures 20(34%). Fractures of the ribs are the most common of the skeletal injuries, 35 (59%). The most frequent impact of the body was made with the head 29 (49%), followed by the body 18 (31%), and the least with the legs 12 (20%).

The study concludes that accidents are the most common manner of death among victims falling from heights of less than 7 meters.

P31 - Three-dimensional (3D) printing in forensic pathology

Gábor Simon[1], Dénes Tóth[1], Viktor Soma Poór[1]

[1] University of Pécs, Medical School, Department of Forensic Medicine, Pécs, Hungary

Three-dimensional (3D) printing refers to a method of manufacturing a physical object from digital information. 3D printing became widely available in the past decade and is commonly used in several medical fields. Practical forensic pathological applications of 3D printing have also appeared in the past 5-8 years.

3D printing can be used in forensic pathology for courtroom demonstration purposes, reproducing weapons for weapon-injury comparisons (physical fit analysis), and reproducing missing or damaged bone parts for cadaver reconstruction. It also holds enticing possibilities in the education of forensic pathology.

We are exhibiting the most common methods of 3D printing and also illustrating the forensical feasibility of the technique with practical applications.

P32 - DNA extraction and STR profiling from histological slides

Vivien Fejes [1], *Viktor Soma Poór* [1], Marah Alhabahbeh[1], Gábor Simon[1]

[1] Department of Forensic Medicine, Medical School, University of Pécs, Pécs, Hungary

Formalin-fixed paraffin-embedded (FFPE) tissue blocks are commonly used in the field of pathology and forensic pathology as a source of histological slides.

Time to time, the need of providing an STR profile from an FFPE block arises, usually due postmortem identification or paternity cases. While both formalin and xylol (used for removing the paraffin) are well known to decrease DNA integrity, DNA extraction from FFPE blocks are part of the routine investigations, its protocols are well established, there kits optimized for this purpose.

However two cases of our cases, where we had to provide STR profiles from microscope slides, instead of full FFPE tissue blocks highlighted that there are methodological questions, which are far less addressed. The limited amount of tissue, the mounting medium and the need to remove the cover slide all pose a challenge on their own.

DNA extraction tests were performed on 3- to 7-year-old histological slides. Xylol was used to dissolve the mounting medium to facilitate cover slide removal. It was found that shaking the sample while bathed in xylol, decreased the incubation time from three days to two days. This not just reduced the processing time, but increased the quality of acquired STR profiles: on average 30% more alleles were detected from the shaken samples compared to the still bathed ones.

Preliminary results showed no difference in the detected alleles between hematoxylin-eosin stained and unstained samples, but further experiments are necessary to fully explore the effect of different staining methods of STR profiling.

How insects can help to estimate the minimal PMI

Javorski, Dominik [1]

[1] Center for Forensic Medicine, Vienna, Austria

Climate change is undeniable: Ecosystems, which adapted over time to stable environmental patterns and factors, are confronted with a sudden change (anthropogenic climate change) and the animals, plants and fungi must adapt to thrive and survive. While homeothermic animals have their own challenges to overcome regarding a changing climate, the repercussions on poikilothermic animals, like insects, should not be neglected, especially if their life cycles are at the core of scientific research.

Previous work already suggested that the climate change has a potential effect on the different insect species globally, which might pose as an additional challenge for the work of forensic entomologists. Calculating the minimal PMI (postmortem interval) relies on careful observations, proper taking of evidence and measurements, as well as on knowledge about the local species and how long it takes to develop from egg to adult. Not only does a shift in temperature influence the development speed of forensically important species, it might also lead to adaptations of tolerance levels over time. In Austria, there are even changes to the diversity of fauna colonizing a corpse, as animals originating from Africa or Asia are common already, especially during the warmer months. Controlled laboratory data is used in addition to calculated corrected crime scene temperatures to estimate the time of death, if blowfly larvae are present and their development stage and species is known. Therefore, it is essential to update the laboratory growth data of blow fly populations in Austria, to ensure the most precise assessment.

Uncommon gunshot injuries exemplified by case material and supplemented by experimental studies

Stefan Pollak[1]

[1] Institute of forensic medicine, University of Freiburg, Freiburg/Br., Germany

The morphological assessment of gunshot injuries is prone to error due to the great variability of the possible appearances. This is reflected in a high number of misinterpretations both in clinical medicine and in autopsies. The main reason for that is the complex interaction between the bullet and combustion products on the one hand and the penetrated tissues on the other hand. The presentation provides relevant examples from practical casework and experimental setups simulating the real conditions (e.g. test shots to composite models). The topics dealt with comprise a wide range of constellations such as differing sizes of bullet entrance holes in skin, contact shots from blank cartridge handguns, the punched-out tissue complex in shots from captive-bolt guns, the shape and width of abrasion collars depending on the bullet shape, GSR deposition along the bullet path in contact shots, muzzle imprint marks constituted of intradermal blood extravasations, the varying size of exit wounds as a consequence of the temporary cavity, the appearances of reentry shots, textile fibres along the bullet path, skin tears away from the entrance wound in gunshots to the head, wounds from muzzle-loading weapons, bullet entrance wounds in palms and plantae, injury potential of soft-air pistols and airguns, peculiarities in gunshot wounds of the aorta and contact shots from weapons with a flash-suppressor.

The possibilities of the multidisciplinary approach in the investigation of non-natural deaths – case studies

Antal Kricskovics[1], Alexandra Fullár[2], Zsolt Újvári[2], Andrea Harmath[3], András Szécsi[4], István Kristóf[2], Sándor Kosztya[2]

[1] Hungarian Institute for Forensic Sciences, Pécs, Hungary
[2] Hungarian Institute for Forensic Sciences, Budapest, Hungary
[3] Hungarian Institute for Forensic Sciences, Szeged, Hungary
[4] Hungarian Institute for Forensic Sciences, Győr, Hungary

The multitude and wide range of expert areas covered by the Hungarian Institute for Forensic Sciences - especially in relation to forensic pathology, anthropology, criminalistics and physics - offer a unique opportunity for cooperation in the investigation of non-natural deaths, of injury mechanisms and interpretation of possible methods of perpetration. This multidisciplinary approach is not only vital in the reconstruction of evident homicides, but can also provide valuable information to the investigating authorities in the evaluation of so-called "suspicious" non-natural deaths. In this presentation, we would like to shed light on the possible points of connection between some of these individual fields of study through the presentation of the following cases.

In our first case, the post-mortem examination initially concluded that the elderly woman suffered a head injury caused by a fall from stairs, however, the forensic autopsy found multiple injuries that could not be linked to a singular accidental mechanism, so criminal proceedings were initiated. Through the involvement of criminalistics-, blood spatter- and physicist expert examinations, based ont he evaluation of on-site crime scene investigations, blood spatter evidence, documented injuries, 3D photogrammetric visualization of scene conditions, enabling on-site and virtual modeling of possible fall mechanisms, provided hard evidence of a homicide, which ultimately led to the successful conviction of the perpetrator.

Our second case of a more than 20-years-old death due to a train accident, which at the time was assessed as suicidal, however based on new information, authorities ordered a repeat investigation due to suspicion of a crime. An exhumation was performed in order to resolve the partial contradictions between the original autopsy report and the investigative information. The examination of visible skeletal injuries of the human remains, the anthropologist, forensic pathologist, physicist and criminalistics experts involved determined which injuries could have been caused by the

train, and which were related to the alleged abuse that preceded it. With the help of model experiments, 3D visualization and printing of the skull bearing the relevant injuries, the experts were able to succesfully present the recosntructed events in the courtroom, confirming that the victim had suffered a head injury caused by severe physical abuse prior to the train accident, proving that the victim could not have voluntarily lie on the rails, excluding suicide.

Our last case, the body of an elderly man was discovered naked in a remote rape field after his disappearance several days prior. The post-mortem examination documented no relevant injuries, while during the subsequent autopsy, a stab wound to the heart was revealed. Due to advanced decomposition, the macroscopic and histological examinations were of limited value. The forensic pathologist concluded a natural cause of death, while together with the criminalistics expert they evaluated the circumstances of the post-mortem injury, providing sufficient clarification for natural causes.

The above cases are examples of the fact that the effective investigation of uncertain or suspicious deaths - often due to insufficient historical data - is often only possible with complex evaluation involving a multidisciplinary approach and rigorous verification of possible hypotheses.