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**Gunshot defense wounds: The need for a classification**\*P. Beltempo<sup>1</sup>, A. Ostuni<sup>1</sup>, L. Tattoli<sup>2</sup>, F. Vinci<sup>1</sup>, B. Solarino<sup>1</sup><sup>1</sup>University of Bari, Institute of Legal Medicine, Policlinico di Bari, Italy,<sup>2</sup>University of Turin, Section of Legal Medicine, Turin, Italy

**Background.** Defense wounds are injuries caused by the victims attempting to defend themselves. In blunt or sharp force assaults, defense injuries are typically seen on the arms and hands; rarely, can be found on the feet or legs.

Defense wounds in firearm injuries occur when an arm is raised in a desperate attempt to shield the trunk and head from the blast.

**Material and methods.** The case example here presented will show how a classification of gunshot defense injuries can be useful to develop investigative lead information in a homicide case.

On September 2016 gunshots were reported in a residential suburban area. The body of a 33 years old male was found on the scene with multiple gunshot wounds. The circumstantial data obtained suggest that the shooting follow a scuffle between the victim and one or more perpetrators.

**Results.** A complete external examination and medico-legal autopsy were performed. Wounds location, appearance, path of the missile, injuries produced, and site of exit wounds were thoroughly reported. Clothing defects were also described and firing distance was estimated through evaluation of soot and powder marks plus colorimetric method (sodium rhodizone).

The following gunshot trajectories were summarized:

1. Left upper chest (Entrance Wound) → Left Lung → Heart → Diaphragm → Abdominal Aorta (Retained bullet);
2. Right abdomen (EW) → Left Sacrum (RB);
3. Right hand's back (EW) → palm (Exit);
4. Channel wound on left hand → Lower forearm (EW) → Upper forearm (Exit).

It was then argued that the third trajectory and the second one could be due to a single gunshot.

**Discussion and conclusions.** The case study highlighted the need for a classification for gunshot defense injuries as passive or active. Gunshot passive defense injuries (GPDI) occur when the victim raises the hands or arms for protection while in active defense wounds (GADI) victim tries to seize the weapon or the attacker's weapon-holding hand.

In GPDI victims can be highly incapacitated from previous injuries while GADI are usually the result of a scuffle. GADI always present with soot/powder residues which can be absent in GPDI if the bullet is shot from distance. In GPDI the missile(s) shot are more likely to re-penetrate the trunk then in GADI due to muzzle deflection operated by the victim.

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**Traffic death due to an unmanned vehicle with manual transmission that went into reverse**

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**Background.** Forensic autopsies in traffic accidents require a thorough knowledge about characteristics of the vehicles involved.

**Material and methods.** Case: A woman in her 80s was found dead with her chest crushed while standing between the tailgate of a small truck and sliding garage door. The small truck had an older manual transmission; the ignition key was in the "on" position, but the engine had stopped because of a dead battery. The truck was in reverse gear, the parking brake was only partially engaged, and the doors were closed. There was no obvious damage to the truck body.

**Results.** Autopsy findings: Horizontal skin marks on the anterior and posterior thorax, resulting from contact with the rear of the truck and the garage door, were present. There was no facial congestion, but the sternum and multiple ribs were fractured. Subepicardial hemorrhage and myocardial contusion at the cardiac apex, rupture of the posterior wall of the right ven-

tricle, and left ventricular subendocardial hemorrhage were present. There was also a 15-mL bloody pericardial effusion. The lower lobes of the lungs were collapsed. Toxicological analysis was negative for alcohol and other drugs. Testing of the vehicle in question showed that, with the parking brake partially engaged, the truck was in reverse gear, and even if the foot was removed from the clutch pedal, the engine did not stall and went into reverse. With the parking brake fully engaged, the truck would not go into reverse.

**Discussion and conclusions.** The cause of this accident was that the deceased woman did not fully engage the parking brake, and she got out of the truck without stopping the engine. As a result, her chest was crushed by the unmanned small truck that went into reverse, causing cardiac injury and cardiac failure, and she rapidly died.

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**Asymptomatic giant left atrial appendage: A forensic case report**N. Turkmen Inanir<sup>1</sup>, B. Eren<sup>2</sup>, M. S. Gurses<sup>2</sup>, F. Eren<sup>2</sup>, \*T. Aydogan<sup>1</sup>, O. Akan<sup>2</sup>, U. N. Gundogmus<sup>3</sup><sup>1</sup>Uludağ University Faculty of Medicine, Department of Forensic Medicine, Bursa, Turkey, <sup>2</sup>The Council of Forensic Medicine, Bursa Morgue Department, Bursa, Turkey, <sup>3</sup>Istanbul University, Institute of Forensic Medicine, Istanbul, Turkey

**Background.** Congenital or acquired giant left atrial appendage is rarely seen an anomaly of the heart and likely, is caused by congenital dysplasia of atrial pectinate muscles. Diagnostic criteria for giant left atrial appendage are origin from an otherwise normal left atrium, well-defined communication with the left atrium, position within the pericardium and distortion of the left ventricle free wall by the aneurysm. As a giant left atrial appendage may be asymptomatic, may exhibit supraventricular arrhythmias, systemic thromboembolism, cardiac dysfunction or specific chest pain.

**Material and methods.** This case report presents that 70 year-old man, who had no known disease, was found as dead in his house, was performed an autopsy.

**Results.** At autopsy, in external examination, pink-reddish in colour of livor mortis, soot in hands and feet were observed. In internal examination, pink-reddish in colour of subcutaneous tissue and muscles of body, pink-reddish in colour of surface and sections of heart, giant left atrial appendage in the heart were detected. In chemical examination, level of carboxyhemoglobin was detected as 61% and there was no other substance in blood and urine. It was reported as a result of autopsy, death occurred due to carbonmonoxide intoxication. Although in our case seen not any symptoms, we want to take attention about severe complications of the giant atrial appendage in the heart.

**Discussion and conclusions.** We aimed to present the case of asymptomatic giant left atrial appendage with autopsy findings in medico-legal literature.

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**The study temporal dynamics of the phase shift between orthogonal components of the amplitude of the laser radiation scattered by spleen tissue to diagnose the prescription of death coming**\*O. Pavliukovych<sup>1</sup>, V. Bachinskiy<sup>1</sup>, N. Pavliukovych<sup>2</sup><sup>1</sup>Higher State Educational Establishment of Ukraine, Department of Forensic Medicine and Medical Law, Chernivtsi-city, Ukraine, <sup>2</sup>Higher State Educational Establishment of Ukraine, Department of Internal Medicine, Clinical Pharmacology and Occupational Diseases, Chernivtsi-city, Ukraine

**Background.** The authors have carried out a comparative study of distributions of the degree of depolarization of laser radiation scattered by the spleen tissues for the purpose of searching new parameters of diagnosing the prescription of death coming. The basic tasks of practical forensic medical experts are establishing the cause of death and the prescription of its coming that is very complicated due to the absence of circumstances and objective data which would be able to point out a possible time of its

coming. This research is aimed at detecting temporal spectral changes of depolarizing laser irradiation by means of sections of the human spleen tissue to diagnose the time of death coming.

**Material and methods.** Sections of the spleen tissue of people who died as a result of mechanical asphyxia ("A") – 100 defuncts and massive blood loss ("B") – 98 defuncts. The sections under study were placed in a laser unit where a collimated beam radiation was carried out ( $\varnothing=104\ \mu\text{m}$ ) of He-Ne laser ( $\lambda=0.6328\ \mu\text{m}$ ). Polarizing images, were formed in the plane of a light-sensitive platform (800×600) of the CCD camera whence they were transmitted to a personal computer to implement further mathematical processing.

**Results.** All objects possess optically anisotropic component, illustrating the distributions of intensity of laser radiation. Higher level of the intensity is characteristic of polarization images of the biological tissues of type "A" in comparison with the similar polarizing visualized structures of tissue of type "B". The results of investigating the temporal evolution for the depolarization degree for imaging the spleen tissue of type "A" and "B" for the time of registration from 1 to 24 hours after death coming.

Structural heterogeneity of distributions  $\Delta(x, y)$  formed by combination of small-scale sites values of the degree of depolarization, arranged randomly in the plane of the spleen tissue; an increase of the level of the depolarization of scattered radiation and transformation of sizes of sites of identical values  $\Delta(x, y)$  in a direction of enlarging geometrical dimensions with a time increase after death coming; slower temporal change of three-dimensional distributions of the degree of depolarization compared with dependencies  $\Delta(x, y)$ .

**Discussion and conclusions.** The revealed specific characteristics of a transformation of polarized layer radiation that passed through the blood saturated laser of the spleen tissue may be associated with the following features of its morphologic structure.

The spleen tissue, its parenchyma is made up of small-scale structures, measuring 10–40  $\mu\text{m}$ . After the passage of the laser beam the coordinate distribution within the limits of the shear plane is formed in the shape of small-scale sites.

Similar tendencies of a change of the two-dimensional and three-dimensional structure of the of the depolarization degree were detected for laser radiation scattered by the spleen tissue of type A.

The use of a three-dimensional parameter of the depolarization of laser radiation scattered by sections of the biological tissues of the human body may be used for a search of new criteria for an expansion of possibilities of diagnosing the time of death coming.

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##### **Pseudo pneumatosis intestinalis sign; postmortem CT depicted „*Taenia saginata* (parasite)“ in a young-Thai-man's intestine**

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**Background.** Case presentation: 29-year-old Thai man was found dead at his home in Japan by his partner who lived together. She called ambulance car and he was delivered to the emergency department of a hospital. Resuscitation had been tried about one hour but couldn't succeed and confirmed his death. He had been claiming lack of appetite and fatigueless from 3 days before his death. There was no specific past history. He entered Japan 4 months before his death and was staying in Japan illegally with his partner after his Visa was expired.

**Material and methods.** Postmortem CT Findings: Inside intestine's wall, small nodular and linear gas was depicted. When seen on a lung window, the gas appearance looks like the pattern of which is seen on "Pneumatosis intestinalis"

- There was no fatal hemorrhagic lesions and traumatic lesions.
- On bilateral lungs, consolidation with air bronchogram focused on central area was depicted

**Results.** Autopsy Findings

- There was „*Taenia saginata*“ inside intestine from 4.5 m point from terminal ileum. The length was about 4.5 m long and about 0.1 cm width.

– Pulmonary edema was found.

– There was no other specific findings.

Toxicological and other examinations

There was no abnormalities.

**Discussion and conclusions.** We presented a case with PMCT image of *Taenia saginata* in young-Thai-man's intestine. By noticing the unique findings, we could facilitate the detailed investigation at autopsy and it could deepen the analysis of the cause of death.

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##### **Undetectable cerebellopontine angle tumor with bleeding in postmortem computed tomography before autopsy: A case report**

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**Background.** Intracranial hemorrhage is very important disease, because it frequently causes death. Generally, intracranial hemorrhage could easily diagnose in computed tomography(CT). However, we recently encountered a patient with cerebellopontine angle tumor. Instead of the tumor bleeding at autopsy, the tumor and bleeding could not be detected in post-mortem CT(PMCT) before autopsy.

**Material and methods.** Case report: A 50's man was found dead in the entrance. We deduced his postmortem duration is about three days from his postmortem changes. In postmortem CT, there were not any indicatable changes. At autopsy, there was space occupying lesion(SOL) like hematoma at left cerebellopontine angle. This lesion might press pons. The lesion had spindle-shaped cells and nuclear palisading in Hematoxylin-Eosin staining. In addition, there were positive cells of iron staining.

**Results.** In this case, we diagnosed the SOL as schwannoma. Moreover, the schwannoma bleeds for several times. Thus, we presumed that he died from press of pons by the schwannoma with bleeding. Surprisingly, in this case, we could not find the schwannoma with bleeding in PMCT. Generally, it is considered that almost all intracranial hemorrhage could be detected in CT. However, some studies reported that we were unable to detect some of intracranial hemorrhage in CT, like our case. In addition, we were able to detect the schwannoma in postmortem CT after reconstruction of the CT image on the basis of autopsy findings by radiologists. Cooperating with radiologist is very important to improve diagnostic accuracy.

**Discussion and conclusions.** We encountered the case of cerebellopontine angle tumor with bleeding, which we were unable to detect in PMCT before autopsy. We should keep it in mind that we might miss some intracranial hemorrhage in PMCT. And it will probably lead to improvement of diagnostic accuracy that we cooperate with radiologist.

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##### **Hemopericardium caused by a possible non-traumatic right atrial appendage rupture: An autopsy case**

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**Background.** Although cases of hemopericardium caused by a right atrial rupture have been occasionally reported, the vast majority are ascribed to external blunt trauma. We report a case of death from right atrial appendage (RAA) rupture, possibly due to a non-traumatic disorder.

**Material and methods.** Case: A 43-year-old woman found in a squatting position at her home was transported to a local hospital, but was pronounced dead on arrival. She had taken oral steroids for systemic lupus erythematosus for approximately 22 years, but discontinued 6 months earlier. She had gradually become unable to go outside and started losing ap-