E11 A Usual Cause of Hospitalization and an Unusual Cause of Death

Giuseppe Bertozzi, MD, Deptartment of Forensic Pathology, Viale degli Aviatori, 1, Foggia 71121, ITALY; Francesca Maglietta, MD, Viale degli Aviatori, Foggia 71121, ITALY; Giuseppe Davide Albano, Viale degli Aviatori, 1, Foggia 71121, ITALY; Mauro A. Ciavarella, University of Foggia, Forensic Department, Viale degli Aviatori, 1, Foggia 71121, ITALY; Gabriela Perilli, MD, Viale degli Aviatori, 1, Ospedale Colonnello D'Avanzo, Foggia 71100, ITALY; Dania De Carlo, MD, Ospedale Colonnello D'Avanzo, Viale degli Aviatori, 1, Foggia 71100, ITALY; and Irene Riezzo, MD, PhD, University of Foggia, Osp D'Avanzo, Dept of Forensic Pathology, Viale degli Aviatori, 1, Foggia 71100, ITALY*

The goal of this presentation is to illustrate how a traffic accident, which is one of the most frequent causes of morbidity and mortality in the general population, can lead to death following a microtrauma such as a metatarsal fracture.

This presentation will impact the forensic science community by informing attendees that although car accidents are a well-known cause of death, they are usually associated with multiple injuries to various organic structures, making it difficult to decide which was the most serious and mortal wound. Even a simple metatarsal fracture can act as a co-cause of death. Thus, the importance of recognizing typical and atypical patterns of injury associated with traffic accidents could provide a tailored measure for the initial assessment and management of trauma patients in order to improve outcomes.

This case dealt with a patient who came to the emergency room following a car accident. Upon arrival, he complained of right foot trauma that was treated with a temporary immobilization device; however, at the physical examination, the physicians diagnosed a respiratory and cardiac insufficiency with acute pulmonary edema in the patient who had a history of hypertensive cardiac disease and chronic atrial fibrillation in pharmacological therapy.

Due to clinical conditions, urgent hospitalization in the cardiology ward was provided with a diagnosis of respiratory failure and severe respiratory acidosis. Thus, mechanical ventilation was performed, with a subsequent improvement of the clinical parameters. The next morning, the doctor in charge was alerted because of a worsening of clinical conditions. A thoracic Computed Tomography (CT) scan was performed and documented several areas of parenchymal consolidation of the left lung base associated with diffuse fibrosis, including widespread chronic bronchopathy, no pneumothorax, no fractures. At the end of this investigation, the patient presented with a loss of consciousness and the disappearance of the peripheral and carotid pulse; a cardiopulmonary resuscitation was performed with negative results and the patient died. During autopsy, an increased heart size of 700gr was documented; the left lung, which also increased in size, weighed 850gr and the right lung weighed 610gr. The bronchi displayed the release of a foamy reddish-colored material instead of blood fluid released from the great pulmonary vessels. In addition, an incision was made on the right foot dorsal region, highlighting the presence of a hemorrhagic infarction of the soft tissues, which revealed the presence of a fracture of the fourth metatarsus. Histologic examination demonstrated trivasal coronary artery stenosis, interstitial and perivascular fibrosis, numerous necrotic contraction bands, interstitial edema, mild disarray of the right ventricle, chronic emphysema, endoalveolar edema, interstitial fibrosis, areas of atelectasis, massive embolization, and partial fat. In conclusion, the cause of death was attributed to the concatenation of pathophysiological events, following a stress-induced event (represented by the car accident), which caused a ventricular tachyarrhythmia and massive pulmonary embolization from the fracture of the right fourth metatarsal, resulting in respiratory failure from acute pulmonary edema.

This seems to be the first case in which these multiple mechanisms are described acting together as co-causes of death. A review of the literature revealed that the occurrence of Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE) after foot surgery is generally believed to be low. The National Trauma Data Bank data set (2007-2009) was used to evaluate the incidence of thromboembolism in foot trauma, identifying risk factors associated with the thromboembolic complications. Significant risk factors statistically associated and clinically relevant to both DVT and PE in foot trauma were older age, obesity, and a higher injury severity score. Each of these existed in this case. On the other hand, only one case dealing with a 42-year-old healthy male patient who suffered fractures of the calcaneus, navicular, talus, and metatarsal bone caused by an accidental gunshot wound while hunting was associated with a cerebral fat embolism.

Due to the low incidence, routine pharmacologic thromboprophylaxis might be contraindicated in foot trauma; however, careful, individualized assessment of the risk factors associated with DVT and PE is important in order to prevent embolic complications.

Car Accident, Metatarsal Fracture, Massive Pulmonary Embolization

*Presenting Author