



G123 Evaluation of Prevalent Ischemic Damage at the Right Ventricle Compared to the Left One: Improvement of a Diagnostic Tool for the Diagnosis of Fatal Pulmonary Fat Embolism?

Tony Fracasso, MD, CMU-Centre Univ, Romand de Medecine Legale, Rue Michel-Servet 1, Geneva, SWITZERLAND; Sara Sabatasso, MD, Univ Center of Legal Medicine, Univ Hospitals of Geneva, 9, Ave de Champel, Geneva, SWITZERLAND; Bettina Schrag, MD, Hopital du Valais, Institut Central, Medecine Legale, Ave du Grand-Champsec 86, Sion, SWITZERLAND; and Patrice Mangin, MD, PhD, Centre Univ, Romand de Medecine Legale, Rue du Bugnon 21, Lausanne, SWITZERLAND*

After attending this presentation, attendees will improve their knowledge on the physiopathology and pathology of cardiac damage after pulmonary Fat Embolism (FE). They will learn how immunohistochemistry can be helpful in the diagnosis of fresh ischemic cardiac changes and they will learn how to interpret right ventricular ischemia in cases of pulmonary FE.

This presentation will impact the forensic science community by providing a useful tool for a better diagnosis of fatal pulmonary fat embolism.

FE is a common complication of blunt force injuries occurring in major traumas, especially if fractures of long bones are present. In cases of fulminating FE, the sudden massive obstruction of the pulmonary circle determines a rapid and often lethal increase in the impedance to right ventricular ejection with subsequent right heart ischemia and failure.

Recently proposed was a method to evaluate the occurrence of prevalent right ventricular ischemia determining acute right heart failure in cases of severe pulmonary FE. This method allows the morphological diagnosis of primary right heart failure due to acute persistent pulmonary obstruction. The major limits of this work are bound to its retrospective character: in relatively few cases of pulmonary FE, immunohistochemical investigations were performed on available paraffin-embedded blocks of cardiac tissue, collected at autopsy on the basis of a routine sampling protocol without an extensive systematic investigation of different anatomical regions. The study presented here has different goals. First, the preliminary study was investigated to show a more consistent number of cases in a prospective protocol. Another area of interest was to study whether right ventricular damage is homogeneously distributed in the different regions of the right ventricle in cases of severe fatal FE. Finally, the question of the role of this method as a potential tool in the improvement of the medicolegal diagnosis of fatal pulmonary embolism was addressed during this study.

In a prospective study 220 consecutive autopsy cases performed at the University center of legal medicine in Geneva (Switzerland) between July 2010 and March 2012 were investigated. In each case, eight cardiac regions (anterior, lateral and posterior wall of the right and the left ventricle, anterior and posterior part of the interventricular septum) were sampled and standard histology staining (hematoxylin and eosin, Masson's trichrome) were performed. Moreover, immunohistochemical reactions with the antibodies against Fibronectin and the terminal complement complex C5b-9 were performed. FE was determined by means of frozen sections of the lungs (one sample from each lobe was collected and investigated), the central nervous system (one sample from the cerebral and cerebellar cortex and from the pituitary gland was collected and investigated), and the kidneys (one sample from each organ). The frozen sections were stained by oil red O staining.

The slides were investigated by two different observers with final consensual evaluation. In case of discord, a third forensic pathologist gave his advice and was allowed the final decision. Classical histology signs of fresh cardiac damage such as hypereosinophilia, presence of contraction bands, myocytolysis, fragmentation of the cardiomyocytes, interstitial bleeding, and inflammatory infiltrates were systematically searched and classified into four degrees (absent, weak, moderate, and severe). Similarly, the immunohistochemical reactions against the antibodies Fibronectin and C5b-9 were classified into four degrees (negative reaction, single cell reaction, group cell reaction, and diffuse reaction). The degree of FE was determined following the method proposed by Falzi.

In this presentation, the results of this study will be presented and the implications for the routine medicolegal investigations will be discussed.

Fat Embolism, Right Ventricle, Ischemia