

## G41 Iatrogenic Laceration of a Pulmonary Angiomatoid Lesion: Fatal Complication or Medical Error?

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After attending this presentation, attendees will understand the diagnosed lesion.

This presentation will impact the forensic science community by stressing the importance of performing histological examination in any iatrogenic deaths to recognize underlying diseases and their eventual causal role in determining the fatality.

Percutaneous tube thoracostomy is a standard therapy for a number of pulmonary disorders. Even if it remains the most widely performed procedure to manage blunt or penetrating chest traumatism, and it is generally considered a simple procedure, this life-saving maneuver can be frequently associated with several complications, such as lung or heart perforations, arterial or venous injuries, neurological dysfunctions, injuries to the oesophagus, phrenic nerve and abdominal organs, bronchocutaneous fistula, and perforations of the mediastinal pleura with subsequent contralateral pneumothorax.

A case of a 76-year-old man, admitted to a peripheral hospital after a car accident, presenting bilateral flail chest, and subcutaneous emphysema is presented. Bilateral chest tubes were placed between the anterior and the mid-axillary lines. On the 3<sup>rd</sup> and 9<sup>th</sup> day of hospitalization the patient underwent surgical stabilization of bilateral flail chest with Kirshner wires and metal plates. The postoperative recovery was characterized by multiple recurrences of pneumothorax and subcutaneous emphysema with oxygen desaturation. For these reasons several bilateral drains were inserted with the trocar technique, the last one on the 25<sup>th</sup> day of hospitalization. A control CT scan showed that the tip of the chest tube, inserted between the anterior and the mid-axillary line, was located in the parenchyma of the left lung. Immediately after the withdrawal of the drainage tube the patient became unstable with low blood pressure and tachycardia, and was intubated with a double-lumen tracheal device. A fibrobronchoscopy performed through the tracheal tube revealed profuse hemorrhagic secretions. Because of the severe clinical conditions, the patient was transferred to our hospital where, despite multiple blood transfusions, he arrived pulseless and died after 60 minutes of cardiopulmonary resuscitation.

At autopsy the victim was found to be affected by an extensive hemothorax resulting from the laceration of a dilated vessel on the anterior surface of the inferior lobe of the left lung. Histology revealed that the vessel consisted of an "angiomatoid lesion," the distal component of a plexiform complex, the hallmark of plexogenic pulmonary arteriopathy, an idiopathic disease that may accompany primary pulmonary hypertension.

The risk of lung perforation during tube thoracostomy depends on several factors related to the patient (pulmonary contusion, pleural adhesion, adult respiratory distress syndrome, age above 60, mechanical ventilation) or to the method used for the insertion of the chest tube. Particularly, lung perforations have been reported more frequently with the trocar technique, where the insertion is determined by a metal rod projecting slightly from the tip of the tube, rather than the blunt dissection technique, where the penetration of the tube through the chest wall is prepared with a Kelley clamp.

In the reported case, even if the trocar insertion procedure was performed correctly, the penetration of the metal rod into the lung parenchyma produced a tear of a sub-pleural angiomatoid lesion. Initially the catheter blocked the blood flow through the iatrogenic

injury, but its removal generated a profuse and extensive bleeding into the pleural space.

The treatment of choice in such cases is an emergency resuscitative thoracotomy, defined as a thoracotomy performed immediately in the emergency room/department or in the operating room, because it enables a fast identification and suture of the vascular injury. However, when huge and dilated vessels are lacerated with subsequent extensive pleural hemorrhage (as in the reported case), the outcome is very poor. Thus, the most important thing is to prevent similar emergency conditions by choosing the blunt dissection technique instead of the more dangerous trocar insertion method, particularly in patients affected by adult respiratory distress syndrome or pulmonary hypertension that show an increased incidence of peripheral venous ectasias.

It is believed that the case could be of interest for the forensic community not only for the singularity of the reported lesion, but also for underlining once again the importance of performing histological examination in any iatrogenic deaths to recognize underlying diseases and their eventual causal role in determining the fatality.

**Forensic Pathology, Angiomatoid Lesion, Iatrogenic Death**

## G42 Pedestrian Fatalities in Maryland: How Many, Who, When, Where, Why, How, and Ways to Prevent Them

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After attending this presentation, attendees will have a clear picture of the characteristics of pedestrian fatalities in Maryland. The presentation includes social, geographic, medical, and traffic related data from the previous five years.

This presentation will impact the forensic science community by discussing how understanding the nature and causes of a problem in its totality (in this case pedestrian deaths in an entire state), is the first step in correcting it. This presentation will suggest implementations for reducing the rate of fatal pedestrian accidents in the State.

**How Many:** In the last five years, a total of 400 pedestrian fatalities were studied at the State of Maryland Office of the Chief Medical Examiner (OCME). The majority of the cases had a complete postmortem examination (97.5%), with toxicologic analysis (for the presence of volatiles in 99% and drugs screening performed in 92%).

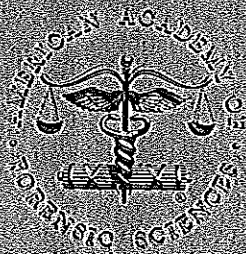
**Who:** The majority of the victims were male (69.5%), aged 1 to 99 years (mean and standard deviation: 43.9 and 19.9 respectively). 179 individuals (44.8%) were African-American, 168 (42%) Caucasian, 36 (9%) Hispanic, 10 (2.5%) Asian, and 7 (1.7%) belonged to other racial/ethnic groups. More than half of the victims (54.3%) were transported to the hospital before they were pronounced dead (data is skewed due to a few cases with long survival; median survival of 59 minutes, mean of 34.6 days), and 181 individuals (45.2%) were pronounced at the scene (15.6 minutes after the accident on average; median of 7 minutes). Another individual died at home three and a half days following the accident, and another at a nursing home, three months after the accident.

**How:** Most (more than 90%) events were witnessed and had a single vehicle involved. The impacting vehicle was recorded in 339 cases (85%), 181 (53.4%) were passenger cars, 62 (18.3%) SUVs, 28 (8.3%) pick-up trucks, 25 (7.4%) vans, 22 (6.5%) other trucks, 9 (2.6%) buses, 8 (2.4%) trains, 3 (0.8%) motorcycles and 1 (0.2%) was a bicycle. The manner of death in the majority of the death certificates were listed as accident (98.3%); there were 2 homicides, 3 suicides, and 2 deaths were undetermined. The cause of death was listed as: multiple injuries in 349 cases (87.3%), head or head and neck injuries only in 27 cases (6.8%), and complications of multiple injuries in 14 cases (4%), with a variety of other causes listed in the remaining 10 cases. Ethanol in blood

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