G15 The Importance of Microscopic Examination of the Lungs in Decedents With Sustained Central Intravascular Catheters

Heidi H. Hamilton, MD, Michael J. Caplan, MD, Nicholas I. Batalis, MD, S. Erin Presnell, MD, Cynthia A. Schandl, MD, PhD, and Lee M. Tormos, MD, Medical Univ of South Carolina, Medical and Forensic Autopsy Section, Dept of Pathology and Laboratory Mecidine, 165 Ashley Ave, Ste 309, MSC 908, Charleston, SC 29425*

After attending this presentation, attendees will understand the pulmonary vascular complications of intravenous injection of oral medications and appreciate the frequency of fatal misuse of prescribed long-term vascular access devices, such as central venous lines and peripherally inserted central catheters. Attendees will gain insight into the need for microscopic examination of lung tissue with polarized light and be able to accurately identify, characterize, and diagnose various states of disease microscopically. In addition, the attendees will gain an understanding of some common indications and complications for prescribed placement of long-term vascular access devices.

This presentation will impact the forensic science community by demonstrating the frequency of fatal intravenous injection of oral medications in people with indwelling central intravascular catheters. By highlighting the importance of microscopic examination with polarization of lung tissue in all patients with central intravascular catheters, these findings may directly affect the cause and manner of death in individuals with numerous medical comorbidities.

Recreational intravenous drug users may choose to inject suspensions of oral medications into peripheral veins, muscle, or subcutis using a hypodermic needle. However, central lines, peripherally inserted central catheters (PICCs), implanted vascular ports, and hemodialysis catheters may provide convenient vascular access without the stigmata of other methods. Pulmonary vascular lesions including microemboli, vascular wall and interstitial granulomas, and eventual pulmonary vascular bed destruction frequently result. Herein, the a seven-case series is presented of forensic autopsies performed during the last five years at the Medical University of South Carolina where the decedents all had pulmonary vascular complications stemming from intravenous administration of oral medications through a residing central venous line, peripherally inserted central catheter, vascular access port, or hemodialysis catheter. All of the decedents were in their fourth decade of life; two were male and five were female. Comorbidities that resulted in central venous line, hemodialysis catheter, or vascular access port placement will be delineated and discussed, and concurrent toxicology results will be reviewed. The frequency of these cases and the misuse of medically prescribed long-term vascular access catheters require particular attention. An autopsy of an individual with a vascular access device should include microscopic examination of the lungs under polarized light to identify the fillers and binders used in the production of the oral medications. These insoluble, birefringent substances include compounds such as magnesium trisilicate (talc), microcrystalline cellulose, corn starch, and potato starch. The location of such material should be documented, and long-term effects, such as foreign body granulomas and vascular changes, should be described. Massive embolization of foreign material evident in the pulmonary vasculature explains sudden death in cases where acute drug toxicity may not. Chronic findings including granulomatous obliteration of the pulmonary vasculature with the resulting pulmonary hypertension and right heart failure may explain a cardiogenic death due to intravenous drug use. Therefore, without such investigation, the cause and manner of death may be inaccurately ascribed to the decedent's comorbidities, or the contribution of pulmonary vascular complications stemming from intravenous administration of oral medications may not be appreciated.

Central Lines, Drug Use, Lung Microscopy

 ** Presenting Author*