



H79 Hydrophilic Polymer Embolization: A Common Incidental Finding at Medical Autopsy

*Stephanie M. Richards**, University of Maryland School of Medicine, 655 W Baltimore Street, Baltimore, MD 21201; *Julia Choi*, 22 S Greene Street, Baltimore, MD 21201; *Allen Burke, MD*, University of Maryland School of Medicine, 22 S Greene Street, NBW51, Baltimore, MD 21201

After attending this presentation, attendees will: (1) understand what hydrophilic polymer is and how and why it is used in the medical community; (2) be able to identify hydrophilic polymer emboli and the associated tissue reactions on histology slides; and, (3) become familiar with the potential medicolegal implications of hydrophilic polymer embolization.

This presentation will impact the forensic science community by providing education and improving competence in identifying a common, but only recently described, autopsy finding.

Background: Hydrophilic polymers are substances that are commonly applied to the surface of vascular catheterization devices in order to reduce friction and decrease vascular injury related to cannulation. These polymers have the potential to detach and travel within the bloodstream, causing hydrophilic polymer embolization. These basophilic, often coiled, and focally granular emboli are commonly detected in the lungs at autopsy in patients who have undergone cannulation with large-bore vascular catheters prior to death. Hydrophilic polymer embolization is most commonly an incidental finding but associated complications have been reported.

Design: A retrospective selective autopsy review was conducted at a tertiary care center to identify cases of hydrophilic polymer embolization in the lungs during a 20-month period (November 2012 to June 2014). Autopsy cases were selected for review based on likelihood of detecting emboli; only cases involving large-bore vascular catheterization (central venous catheter, Peripherally Inserted Central Catheter (PICC line), Extracorporeal Membrane Oxygenation (ECMO), angiography, etc.) prior to death were included for review. Original hematoxylin- and eosin-stained slides of lung tissue were examined for the presence of hydrophilic polymer emboli. The total number of slides containing hydrophilic polymer emboli, number of emboli per slide, and tissue reaction to the polymer were also noted. These histological findings were subsequently correlated with clinical information obtained prior to death.

Results: A total of 33 autopsy cases were reviewed (ages: 2.5 months to 78 years; 19 males). In all cases, the decedents had at least one medical procedure involving large-bore venous catheterization prior to death. Of these, nine cases (27%; ages: 2.5 months to 72 years; four male) showed histologic evidence of hydrophilic polymer emboli within the lung tissue. Six of these cases (67%) demonstrated unilateral lung involvement; one case (11%) demonstrated emboli within two lobes of the same lung. In two cases (22%), three lung lobes showed histologic evidence of hydrophilic polymer embolization. Two cases (22%) demonstrated no evidence of tissue reaction to the polymer. Five cases (56%) revealed macrophages and/or giant cells surrounding the polymer; however, in two cases (22%), a more significant reaction was identified, including macrophages and/or giant cells, vascular intimal proliferation, and in one case (11%), thrombus. On medical record review, none of the nine cases were associated with any morbidity or mortality directly linked to hydrophilic polymer embolization.

Conclusion: Hydrophilic polymer embolization, particularly in the lungs, is a common finding at autopsy in patients that have undergone large-bore vascular catheterization prior to death. This finding is largely incidental; however, histologic evidence of tissue reaction can be seen in many cases and rare cases of associated morbidity and mortality have been reported. As such, polymer emboli represent a newly-recognized iatrogenic complication with potential medicolegal implications.

Hydrophilic Polymer, Embolization, Catheterization