

H92 An Evaluation of Selected Hematopoietic Immunohistochemical Stains in Decedents in Varying States of Decomposition

*Catherine R. Miller, MD**, Miami-Dade Medical Examiner Department, Miami, FL 33136; *Juan P. Olano, MD*, The University of Texas Medical Branch, Galveston, TX 77555-0001; *Judith Aronson, MD*, The University of Texas Medical Branch, Galveston, TX 77555; *You-Wen Qian, MD*, The University of Texas Medical Branch, Galveston, TX 77555

Learning Overview: The goal of this presentation is to present data on the utility of postmortem Immunohistochemistry (IHC) in decedents in varying states of decomposition. IHC is often utilized in the surgical and cytopathology realms but is less commonly used in autopsy pathology. This study sought to discover if the quality of immunohistochemical stains decreases with increased decomposition. This will allow institutions to make decisions regarding the benefit of performing the selected stains evaluated in this project on decedents with prolonged death intervals and/or significantly autolyzed tissues.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing utility data to practitioners considering performing postmortem hematopoietic immunohistochemical stains.

Hypothesis: The quality of immunohistochemical staining decreases with increased autolysis.

Methods: Mediastinal lymph nodes were collected prospectively from ten autopsy cases at The University of Texas Medical Branch. The postmortem interval ranged from one to five days. The lymph nodes were fixed in 10% formalin and submitted for routine histologic processing. Each lymph node was stained with Hematoxylin-Eosin (H&E), CD45, CD5, CD20, CD79a, and CD2. Lymph nodes and the IHC markers were chosen for several reasons: (1) approximately 12 cases of lymphoma are diagnosed at UTMB postmortem (no pre-mortem diagnosis available) making lymph nodes a very important postmortem source for hematopoietic markers; (2) mediastinal lymph nodes are more centrally located than peripheral tissue and are thus less susceptible to rapid heating and cooling from transport and storage of bodies; (3) mediastinal lymph nodes are easy to identify at autopsy; and (4) membranous stains were chosen to minimize the number of variables encountered by the reading pathologists.

The signal intensity and quality of the IHC stains were scored by three board-certified pathologists (i.e., observers) including: two autopsy pathologists and one hematopathologist. Average scores for each stain in each case were calculated. These scores were plotted to compare degree of autolysis (represented by H&E average scoring) against quality of IHC staining (represented by the average score of each IHC stain in each case). Inter-Observer Variability (IOV) was assessed using the weighted kappa statistic.

Results: The postmortem interval did not correlate with the degree of autolysis observed in the histologic sections, but observers rated the degree of autolysis seen in each H&E stained section (scale: 1=normal histology with no sinus histiocytosis; 5=severe autolysis) before reading each associated immunohistochemical IHC stain. For the degree of autolysis seen in each H&E section, IOV kappa score was moderate to substantial ($k=0.444-0.653$). A line plot of average scores for both H&E and IHC showed that as the degree of autolysis increased, the quality (signal intensity and completeness) decreased. A line plot of average scores for H&E compared to average weighted kappa values for each case showed no appreciable change in IOV regardless of H&E scores. That is, the degree of autolysis did not appear to affect the observer agreement scores ($m=-0.1159$). IOV kappa score for IHC was highest for CD79a ($k=0.6$), followed closely by CD20 ($k=0.595$). The lowest IOV kappa score was for CD45 ($k=0.312$).

Conclusion: Though IHC is not commonly used in forensic pathology, it is generally available to the forensic pathologist who needs it. IHC is more frequently used in the hospital autopsy setting than in the forensic setting, but its utility for tissues with varying degrees of autolysis has been only rarely studied. This study confirms the prevailing belief among pathologists that usefulness of IHC in the autopsy setting decreases with increased tissue autolysis.

Autopsy, Immunohistochemistry, Lymphoma