



H128 A Comparison of Coronary Artery Stenosis Estimates Made by Forensic Pathologists and Medical Students

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Learning Overview: The goal of this presentation is to inform attendees about the lack of increased accuracy in estimating the percentage of stenosis that results from training and experience, in that forensic pathologists are not more accurate in this estimation than medical students.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing how the accurate estimation of the percentage of stenosis produced by coronary artery atherosclerosis is an important step during the autopsy when determining the cause of death, with an appreciation that training and experience do not necessarily produce better estimates.

Introduction: An important step during the performance of an autopsy is the accurate estimation of coronary artery arteriosclerotic stenosis. Although tools, such as diagrams, exist to aid in improving accuracy, previous studies suggest that more experienced/specialized pathologists (i.e., cardiovascular pathologists) are less accurate than non-cardiovascular specialized pathologists (i.e., residents and clinical pathologists) in estimating the degree of coronary artery stenosis. To further explore these contradictory results, a study was designed to compare the accuracy of coronary artery stenosis estimates made by forensic pathologists versus medical students.

Materials and Methods: Six forensic pathologists and 12 medical students each independently examined 24 images of coronary artery cross-sections with variable degrees of stenosis and gave an estimate of the degree of arteriosclerotic stenosis. The medical students received no specific training prior to their review of the images. The images, including 12 gross and 12 microscopic images, were made available to each participant in a PowerPoint® presentation. The actual percentage of stenosis for each image was determined using ImageJ by measuring the area of the residual lumen and the area of the native lumen. To determine the area of the native lumen for calculation of the actual percentage of stenosis for the microscopic sections, both the outer edge of the intima and the outer edge of the media were measured. Given that the outer edge of the media was more apparent grossly, final analysis utilized the calculated value based on the outer edge of the media only. The median difference between the calculated percentage of stenosis using outer intima and outer media was 5.9%. The results were analyzed with R, with the non-parametric Wilcoxon Rank Sum Test used to determine statistical significance.

Results: Overall, when comparing all 24 images, the forensic pathologists had a median difference between the estimated and actual percentage of stenosis of -12.380 and the medical students had a median difference of -16.50 (p -value of 0.08542); however, for only the 12 gross images, the forensic pathologists median difference was -15.90 and the medical students was -20.90 (p -value of 0.2243), and for only the 12 microscopic images, the forensic pathologists median difference was -6.65 and the medical students was -13.050 (p -value of 0.08398).

Conclusion: In estimating the percentage of coronary artery arteriosclerotic stenosis, specific training in forensic pathology does not guarantee accuracy, with this study showing no statistically significant difference between estimates given by forensic pathologists or medical students and each group underestimating the degree of stenosis.

Coronary Artery, Stenosis, Atherosclerosis