Virtual Autopsy: A Pilot Study

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Background and Purpose : The frequency of traditional autopsy has been declining. Cited reasons include a diminished consent rate, increasing cost and improved pre-mortem diagnosis. Post-mortem radiology (virtual autopsy) is non-invasive and may provide complementary value to traditional autopsy. Virtual autopsy may help focus or limit the scope of traditional autopsies, confirm findings and provide additional pertinent findings. In some cases, virtual autopsy might be able to replace traditional autopsy.

Virtual autopsy may also provide a platform for development and testing of novel imaging techniques and image-guided procedures.

This pilot study explores the feasibility and potential of combined multi-parametric MRI and CT studies to augment traditional autopsy and to test new multi-parametric imaging techniques.

Methods: Three deceased patients were imaged with multi-parametric 1.5T MRI and multi-energy CT within 24 hours of their expiration. Subsequent correlative conventional autopsy was performed in two of the cases. The preliminary imaging findings were given to the autopsy pathologist prior to autopsy for confirmation and evaluation. Additional findings from traditional autopsy were recorded after autopsy. The pathologists then graded the preliminary radiologic interpretation for complementary value.

Results: Most findings pertinent to cause of death were discovered in the radiology and confirmed by the pathology. There were some incidental radiologic findings that did not appear in the traditional autopsy and some traditional autopsy pathology findings that did not appear in the radiology. Overall, the pathologists conducting the autopsies rated the preliminary radiology as having supplied some complementary value.

Conclusions and Significance: Virtual autopsy prior to conventional autopsy is feasible in the hospital setting. Such imaging may provide complimentary value to traditional autopsy. Additional trials would be needed to refine imaging techniques, better assess sensitivity and specificity, and establish cost-benefit ratios.