## H49 Computed Tomography (CT) Findings of Unsuspected Aortic Dissection and Adult Polycystic Kidney Disease (APKD)

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The goal of this presentation is to assist attendees in identifying the postmortem CT findings which alert the forensic pathologist to the coexistence of acute aortic dissection and APKD.

This presentation will impact the forensic science community by assisting those performing medicolegal death investigations to recognize the association of aortic dissection and APKD, enabling them to use these findings on postmortem CT to enhance the performance of the autopsy.

Postmortem CT has been used during medicolegal death investigations to depict pathologic findings prior to the autopsy procedure. Use of CT in deaths by natural causes is more difficult than those associated with ballistic injury and trauma because pathology involves differentiation of soft tissue which is limited without the use of contrast. Patterns which are recognizable can be used to prompt the search for particular pathology. Two cases of unsuspected APKD illustrate this.

**Case 1:** A 39-year-old male who was admitted to the hospital for treatment of deep vein thrombosis and pulmonary emboli became acutely unresponsive and died despite medical intervention. Postmortem CT showed irregular contours and cystic changes in enlarged kidneys and diffuse retroperitoneal hemorrhage in addition to pulmonary congestion. Margins of the abdominal aorta were obscured. Autopsy revealed the presence of pulmonary emboli and confirmed the CT findings of cystic kidneys and diffuse retroperitoneal hemorrhage. A 1cm full-thickness defect was present on the posterior abdominal aorta approximately 11cm proximal to the renal arteries. Histologic sections from the defect showed transmural separation and dissecting hemorrhage through layers of the tunica media. The liver was noted to show no definitive cysts.

**Case 2:** A 62-year-old male was found unresponsive in his home after feeling ill and receiving treatment for gastrointestinal complaints. Postmortem CT showed massive kidneys composed of multiple cysts of varying size and density. Areas of the liver suggested cysts. The heart was enlarged and this was noted on the CT to relate to a large pericardial effusion. The ascending aorta was widened and had irregular margins. At autopsy, a 950mL bloody pericardial effusion was noted. At the aortic valve annulus, there was a longitudinal intimal tear joining a transverse intimal tear with accompanying false lumen. Histologic sections demonstrated a split in the media with layered deposition of blood elements, degenerative changes in the media, and mixed inflammation. The liver contained multiple scattered cysts measuring up to 2.5cm.

Adults with APKD are known to be at risk for vascular abnormalities. The most widely recognized is the intracranial or berry aneurysm. Aortic dissection is also reported and its postmortem CT association is typically pericardial effusion. Case 2 matches this pattern and the laceration is in the arch of the aorta. In Case 1, the CT findings are manifest below the diaphragm and relate to retroperitoneal hemorrhage. This correlates with the location of the laceration in the descending aorta at the level of the diaphragm. There are multiple conditions in which aortic dissection can occur and the suspected mechanism seems to relate to hypertension and/or tissue abnormality. The association with APKD invokes both of these as possibilities. Since APKD is known to affect the liver, the postmortem CT should be examined for involvement. Liver visualization in both cases was suboptimal because the scans were performed with the arms at the sides which introduced artifacts. Correlation between CT and autopsy was correct in both cases with respect to presence but not with regard to details of size and number. In cases with APKD, scans should be repeated with the arms raised overhead for optimal assessment of abdominal pathology.

The pathologist discovering polycystic kidneys on postmortem CT should look for hemorrhage and use the pattern to guide the search for aortic dissection.

**Polycystic Kidney, Aortic Dissection, APKD**