



Pathology Biology Section - 2012

G51 Postmortem Vertebral Arteriography in Forensic Investigations

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After attending this presentation, attendees will understand the techniques and applications of postmortem vertebral arteriography using computed tomography (CT) as a supplement to the forensic autopsy.

This presentation will impact the forensic science community by detailing methods to evaluate vertebral artery injury and pathology using CT that may obviate the need for tedious dissection and/or removal of the neck block.

Pathology and injury to the vertebral arteries are often difficult to detect and document at autopsy. Traditionally, the vertebral arteries are injected with a radio-opaque dye and a radiograph taken. Extravasation of contrast indicates a defect in the artery wall and the area is further explored with either *in situ* or en bloc dissection. A limitation of this technique is the inability to view the artery and surrounding structures in three dimensions. Using CT in place of radiography overcomes this limitation.

A retrospective review of a series of 14 postmortem vertebral arteriograms in 10 individuals was conducted to clarify the optimal technique for antegrade and retrograde vertebral arteriography using CT. Location and method of vascular access, injection volume, and timing were varied. Arteriography was incorporated into the autopsy protocol and findings correlated with the procedure.

In six of 14 studies the vertebral artery injections were done retrograde following removal of the calvarium and brain. Cannulation of each intracranial portion of the vertebral arteries was done with a 5F angiocatheter. Injection volumes of 15-30 cc were used. All six injections were diagnostic. There were five intact arteries and one lacerated artery. In 8 of 14 studies injections were done antegrade following cannulation of the vertebral artery at its take-off in the neck. Both 5F catheters and embalming cannulas were used with some injections made before organ block removal and some made after block removal. Both techniques were satisfactory. All antegrade injections were performed before opening the cranium. A single injection of one vertebral artery with 60cc filled the contralateral vertebral artery and segments of both internal carotid arteries. Bilateral vertebral injections of 30cc achieved better generalized filling. There were four lacerations and five intact vertebral arteries. In one case retrograde filling of the left vertebral following right vertebral injection showed a left vertebral laceration.

Successful postmortem vertebral arteriography can be done during autopsy using an antegrade or retrograde approach. The antegrade technique done before opening the cranium is preferred since it offers the advantage of perfusing the Circle of Willis. Incorporating vertebral arteriography with CT into the autopsy protocol aids assessment and may negate the need for an intricate dissection of the vessels.

Postmortem CT, Vertebral Artery, Arteriography